



Public Water System Annual Report 2022

Name of the Public Water System: **Cartier Regional Water Co-op (CRWC) – 3 Locations**
36.00 – Cartier Regional Water System
89.40 – Headingley Regional Water System &
162.75 – Peony Farm Reservoir Public Water System

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Introduction

The Cartier Regional Water Co-op (CRWC) owns and operates 2 main water Treatment Facilities, 10 rural Reservoirs, 2 Booster stations, 7 Truck fill stations, and approximately 270 km of water main transmission line. The owned reservoir at Peony Farm in Portage la Prairie is supplied with water produced at the city of Portage la Prairie water treatment facility. The CRWC owned and operated water treatment facilities strive to provide high-quality drinking water in sufficient quantity to meet public demand. It is our goal to do so in a safe, cost-effective manner while remaining in compliance with the regulatory requirements governing the provision of drinking water.

We believe that the public has a right to easily access information related to the drinking water they consume and the system through which it is provided. To that end, the Cartier Regional Water Co-op has prepared the following report.

1. Description of the Water System

The Cartier Regional Water System provides potable drinking water to a population of approximately 14,556 users. Treated water produced from the Cartier Regional Water Co-op Treatment Facilities (2) meets all health and aesthetic objectives as stated in the Guidelines for Canadian Drinking Water Quality.

1.1. Water source supply

Both the Cartier and Headingley Regional Water Treatment Facilities (WTF) receive surface water from the Assiniboine River. The Peony Farm Reservoir location receives its water source from the City of Portage La Prairie Water Treatment Facility. A link to the City of Portage La Prairie annual water system report can be found at:

[Water & Sewer - City of Portage la Prairie.](#)

1.2. Intake structures and storage ponds:

The Cartier WTF has a stainless-steel intake structure that is specially designed to prevent injury to fish. It is located immediately north of the Baie St. Paul Bridge and flows through a 400 mm pipe into a concrete wet well on the East shore of the river. Two submersible pumps are available to pump the raw water through a 300 mm pipe to the WTF. Raw water can be pumped either to the aerated raw water storage ponds or directly to the WTF raw water chamber located beneath the water plant. The normal operational strategy is to pump to the north storage pond, flowing into the south storage pond for pre-settling, and pre-treatment in the summer season when required with aeration and algae control. The ponds provide a buffer when river water quality may not be optimal. Currently, the intake is flushed using gravity flow and does not provide a sufficient flow of water to adequately flush the intake screens of silt build-up. When required, clearing of silt and debris from the intake screen is contracted out. The ponds have a common wet well to help identify levels in both storage ponds.

The Headingley WTF utilizes the existing Headingley Correctional Centre (H.C.C.) River Intake Building that is located on the H.C.C. grounds. The CRWC has a memorandum of understanding (MOU) with Manitoba Transportation and Infrastructure (MTI) to own, operate and maintain the intake channel, wet well, pumps and gate valves. The intake channel is made of concrete and directs the flow of the river into the pump house passing through bar screens before entering a pumping chamber. Both chambers are equipped with sluice gate valves that stay open during normal operation. The wet well maintains a static water level and there are two 60 hp pumps that operate on a lead/lag operation and pump water when the raw water storage ponds call to be filled. As the water is being pumped from the wet well into the service line to the ponds, a low dose of algaecide is added to control algae growth and to lower the organic level in the ponds. The river water is pumped through a 400 mm service line into two raw water storage ponds. The raw water storage ponds currently operate in parallel but also can operate independently. There is the ability to isolate one storage pond for maintenance and still supply the WTF with raw water. Both raw water storage ponds are equipped with aeration lines that are fed from blowers that are housed in the Raw Water Pump House (RWP) located next to the storage ponds. The RWP also contains a wet well with level control that indicates the level in the raw ponds and provides the controls back to the RWP pumps. During normal river conditions, the ponds fill regularly. During high flows and high turbidity in the river, the ability to cease filling of the ponds and have plenty of storage to operate the facility is maintained until normal conditions return to the river. Also contained in the wet well are three 100 hp raw water pumps that are called to operate when the WTF is producing water.

1.3. Water Treatment Process:

Cartier WTF:

Raw water flows from the storage pond into the WTF raw water chamber by gravity. A control valve operates to maintain an ideal, stable level in the raw water chamber. The Raw water is pumped by two 20-HP pumps into the raw water process piping to the three-stage flocculation basins. The raw water flows through the process piping where it is injected with a pH suppressant (Sulphuric Acid) and a coagulant to begin the advanced coagulation process. The coagulated water then passes through 2 inline static mixers and an inline magnetic flow meter before it is deposited into the initial flocculation basin. The three-stage flocculation basins provide additional mixing to aid in the coagulation process before the raw water enters the Ultra-filtration (UF) process. The three break tanks provide added mixing and coagulation before the raw water enters the Ultra-filtration (UF) process. A pre-filter to the UF skids removes bigger floc (debris) created in the three-stage coagulation process. The UF provides 0.04-micron filtration and removes virtually all particulate matter before reaching the reverse osmosis (RO) process. The UF process is equipped with a common raw water turbidimeter and individual permeate turbidimeters for each UF train. The permeate turbidimeters are set to alarm at 0.1 NTU and shutdown at 0.29 NTU. The turbidity is monitored continuously, and a value is captured every 5 minutes and reported on a monthly report. The UF Permeate is sent to the UF/RO break tank chambers, where the water is used to feed the RO membranes and as backwash water for the UF membranes. The UF permeate is treated with a low dose of chlorine to eliminate the potential for bio growth in the RO feed chambers. The RO feed pumps supply the UF permeate to the RO membranes during operation. Sodium Bisulphite (SBS) is added

upstream of the RO trains to neutralize the remaining chlorine residual before entering the RO membranes. RO treated water is so pure that a RO by-pass line feeding UF permeate water is used to add necessary minerals back into the water to achieve the desired hardness of the finished water and to stabilize water chemistry. During the summer months, when the organic content in the raw water is at its highest, adjustments are made to lower the UF permeate blend ratio into the RO water to help reduce organic content in the finished water. A sequestering agent is added downstream of the ROs before entering the clear well. This is added to help stabilize the water that enters the distribution system. Turbidity is a measure of the relative clarity of the water and is a key parameter of all drinking water operating licenses. The operating license requires the treatment facility to continuously monitor the turbidity from the Ultra-filtration membranes. The Cartier WTF has 24-hour online monitoring of the UF treated water and final plant effluent going to the distribution system. After the RO process, the water pH is adjusted with Sodium Hydroxide and a small dosage of chlorine is added to disinfect pathogenic organisms (bacteria, viruses, etc.). The free chlorine residual in the treated water entering the distribution system is also monitored and recorded continuously. Fluoride is added to a dosage of 0.70 mg/L concentration for dental health purposes. See Figures 1 and 2 for the process flow diagram.

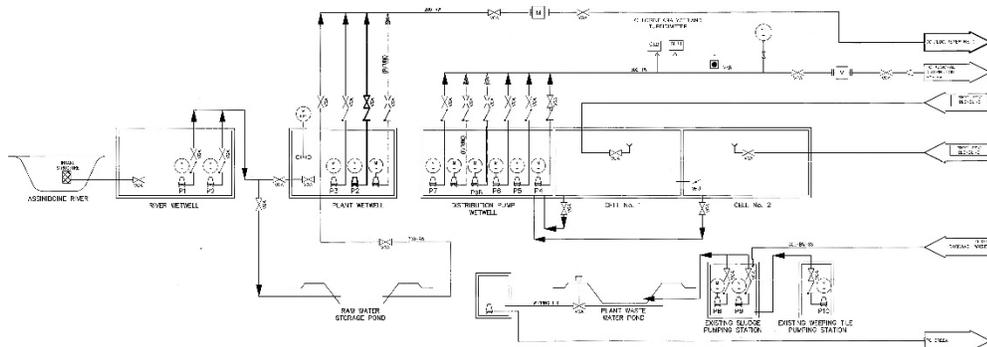


Figure 1 - Cartier WTF Process Flow Diagram 1 of 2

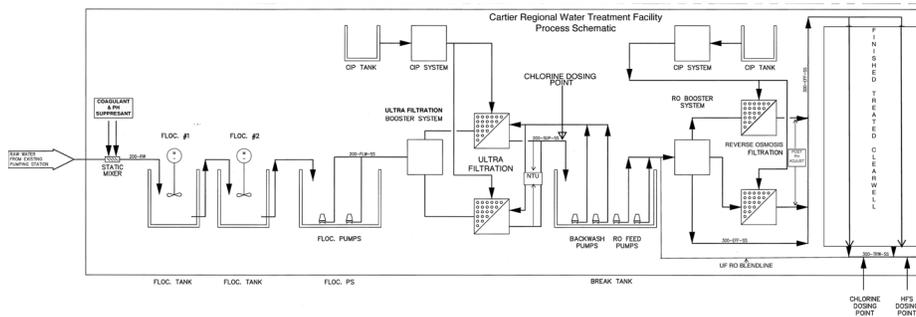


Figure 2 - Cartier WTF Flow Process Diagram 2 of 2

Headingley WTF:

The Headingley WTF operates similarly to the Cartier WTF. They both draw from the same source water, and both utilize the Veolia brand membrane equipment for water treatment. The main difference between the facilities regarding treatment is that the finished treated water is not a blend of UF and RO permeate. Headingley WTF uses Calcite contactors that contain Calcite media to add hardness/minerals back into the finished water. The raw water flows into the facility and passes through 500-micron filters, 2-static mixers, pre-treated with a coagulant and pH depressed with Carbon Dioxide. It travels through two chambers that contain mixers. The mixers promote the reaction of coagulation; raw water particles bind together to form a pin floc. The pre-treated raw water flows into the UF feed chamber and UF feed pumps send the water to the UF membranes. The UFs provide 0.04-micron filtration and remove all-particulate matter before reaching the RO membranes. Each UF membrane skid is equipped with a raw and permeate turbidimeter. The permeate turbidimeters are set to alarm at 0.1 NTU and production to shut down at 0.29 NTU. The turbidity is monitored continuously, and a value is captured every 5 minutes and reported on a monthly report. The UF permeate is sent to the UF/RO break tank chambers, where the water is used to feed the RO membranes and as backwash water for the UF membranes. The UF permeate is treated with a low dose of chlorine to eliminate the potential for bio growth in the RO feed chambers. The RO feed pumps supply the RO membranes during operation. Sodium Bisulfite is added upstream of the RO membranes to neutralize the chlorine. The RO permeate is produced and pH depressed before 50% of it passes through the Calcite contactors. The Calcite and RO permeate blend to achieve a final water hardness of 40-80 mg/L (CaCO₃). The final treated water is pH corrected with Sodium Hydroxide and a small dosage of chlorine gas is used to disinfect for pathogenic organisms (bacteria, viruses, etc.) before entering the clear well storage. The water flows through the clear well to achieve contact time between the treated water and the chlorine for sufficient disinfection before reaching the pump chamber. The free chlorine residual in the treated water entering the distribution system is also monitored and recorded on a monthly report. See Figure 3 for a process overview.

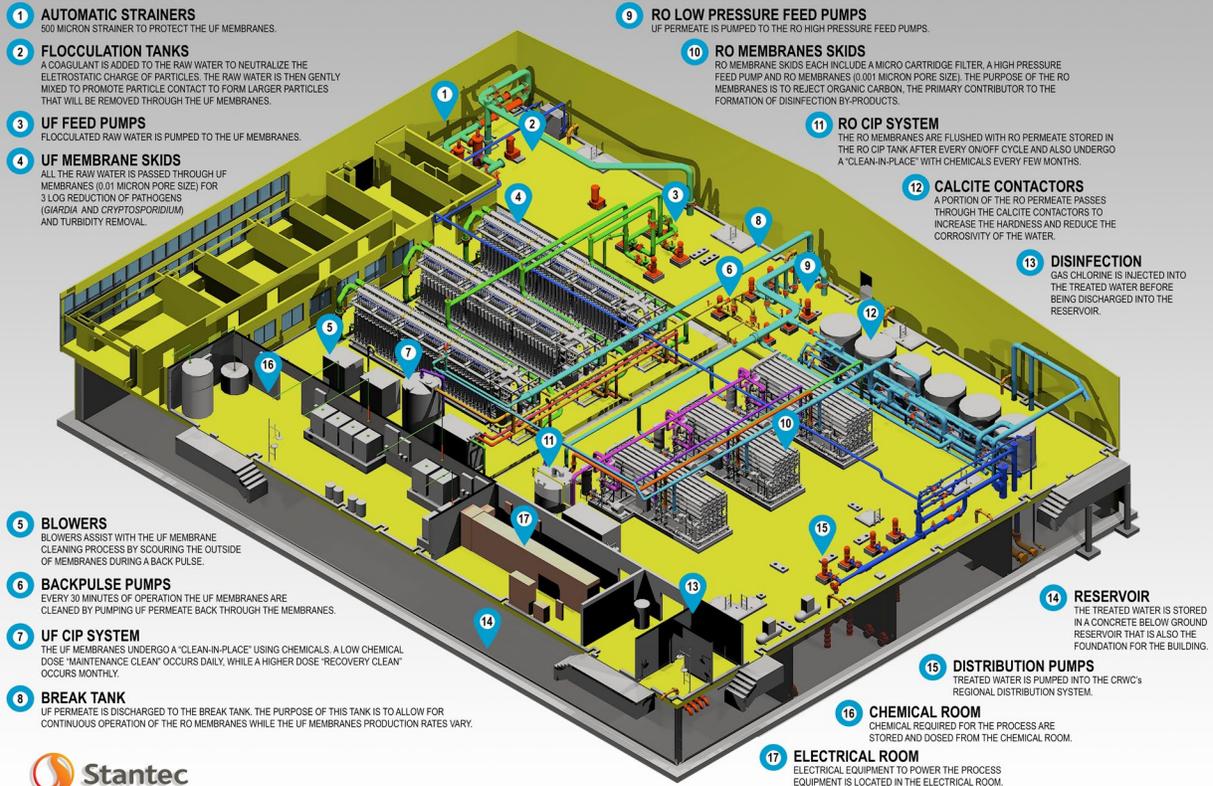


Figure 3 - Headingley WTF Treatment Process Overview

1.4. Distribution System:

Cartier WTF (36.00):

Treated water from the Reservoir is pumped throughout the Cartier Regional distribution system via 1-5 horsepower (HP) jockey pump, 2-25 HP duty pumps, 1-30 HP duty pump, & 1-50 HP stand-by pump. These pumps are controlled by variable frequency drives (VFDs). The CWTF distribution system is partially looped in areas to RM distribution systems and has an overall approximate pipe length of 108 kilometers. Piping is comprised of both high-density polyethylene (HDPE) & polyvinylchloride (PVC) pipe. The Cartier Regional Water System services the RM of Cartier, Portage and Grey. Figure 4 outlines the Cartier WTF service area.

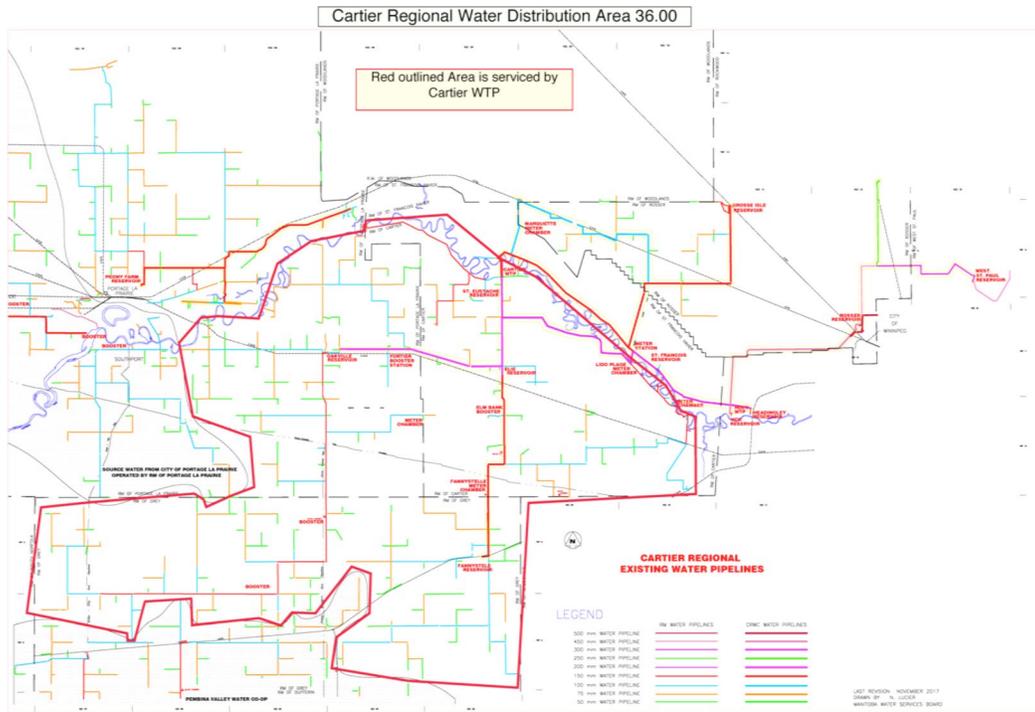


Figure 4 - 36.00 Cartier Regional Water Distribution System Map

Headingley WTF (89.40):

There are (3) distribution pumps that service three main headers that leave the facility into the distribution system. The Centerport distribution line services the Rosser Reservoir for the RM of Rosser. From the Rosser Reservoir, treated water is pumped to the Stony Mountain Institute and to the West St. Paul Reservoir, which services the RM of WSP. The RM of Headingley line services the Headingley Reservoir, RM of Headingley, St. Francois Xavier Reservoir, RM of St. Francois Xavier, RM of Rosser and Grosse Isle Reservoir. The H.C.C./W.W.T.F. line services the Headingley Correctional Centre and the RM of Headingley Wastewater Treatment Facility. The HWTF distribution system is partially looped in areas to RM of Rosser distribution systems and has an overall approximate pipe length of 118 kilometers. Piping is comprised of both high-density polyethylene (HDPE) & polyvinylchloride (PVC) pipe.

Figure 5 outlines the Headingley WTF service area.

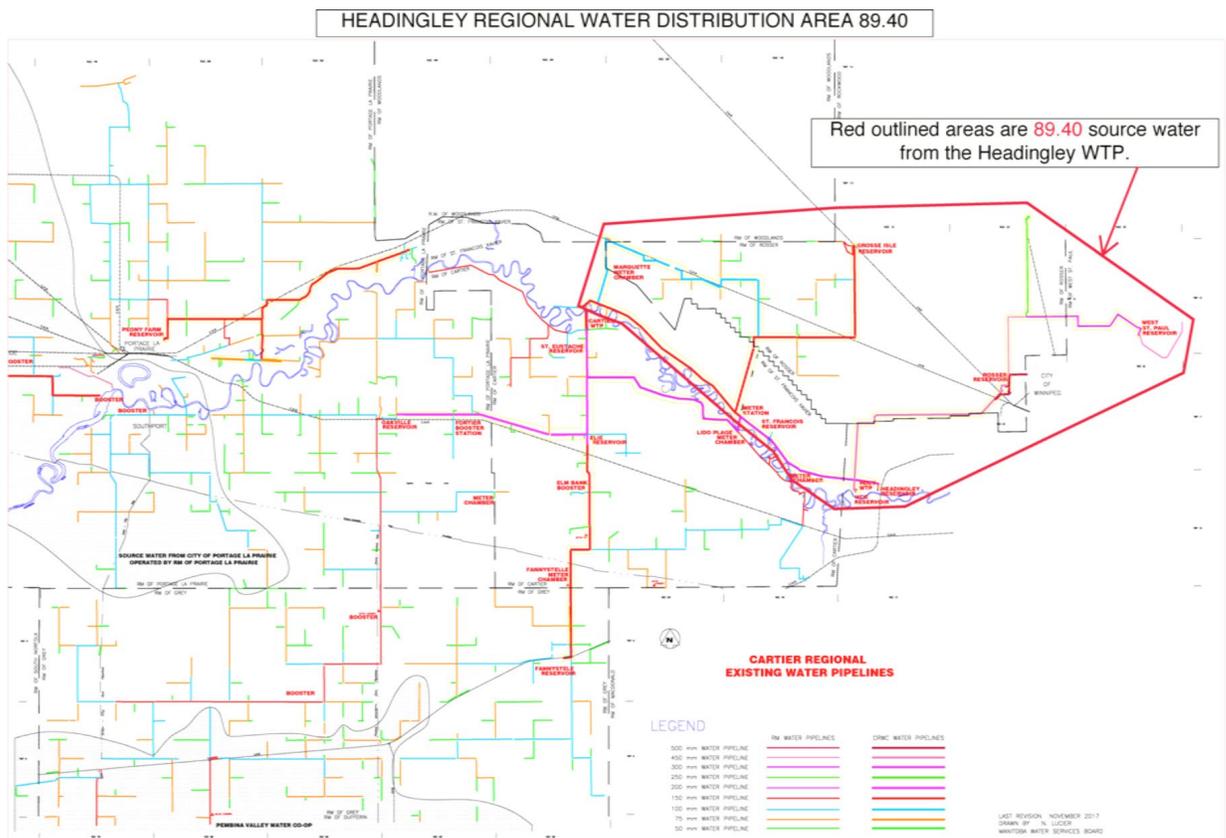


Figure 5 - 89.40 Headingley Regional Water Distribution System Map

1.5. Storage Reservoirs:

<u>Location</u>	<u>Storage Reservoir</u>	<u>Capacity</u>
Cartier Regional WTF	Raw Storage Reservoir	120,000 M ³
Cartier Regional WTF	Treated Reservoir	3000 M ³
Elie Reservoir		960 M ³
St. Eustache Reservoir		76 M ³
Oakville Reservoir		670 M ³
Fannystelle Reservoir		150 M ³
Peony Farm Reservoir	Treated Reservoir	230 M ³
Headingley Regional WTF	Raw Storage Reservoir	135,107 M ³
Headingley Regional WTF	Treated Reservoir	4400 M ³
Headingley Reservoir		2400 M ³
SFX Reservoir		400 M ³
Grosse Isle Reservoir		400 M ³
Rosser Reservoir		7600 M ³
West St. Paul Reservoir		4809 M ³

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

The Cartier Regional water distribution system is comprised of 5162 service connections (all metered) serving a population of greater than 14,556 people in 8 different rural municipalities; the RM of Cartier, RM of Portage la Prairie, RM of St. François Xavier, RM of Headingley, RM of Grey, R.M. of Rockwood, and the RM of Rosser and RM of West St. Paul.

Table 1 - CRWC Population Served (as of 30 Jun 21)

All RMs combined	
BY METER SIZE	
5/8"	4,541
3/4"	38
1"	129
1.5"	208
2"	62
3"	1
8"	2
TOTAL	4,981
ESTIMATED PURPOSE	
Residential	4,803
Commercial	249
Industrial	7
Other	103
TOTAL	5,162
Over 500 M3/quarter	48
2 YEAR FORECAST	
Residential	545
Commercial	51
Other	6
	602
CONSUMPTION	1,894,151 cubic meters
ESTIMATED SERVED POP. *	14,556
FARMS	
Colonies	5
Crops	0
Cattle all forms	10
Hogs	1
Poultry	0
Market	3
Other	1

* Also includes H.C.C. 549; S.M.I. 797 (per Wikipedia, rated population)

1.7 Classification and Certification:

Table 2 - Classification and Certification for CRWC Facilities and Operators

Cartier Water Treatment Facility	Water Treatment Water Distribution	Class 4 Class 2
Headingley Water Treatment Facility	Water Treatment Water Distribution	Class 3 Class 2
Danielle Vaillant <i>Manager</i> <i>Cartier Regional Water Co-op</i>	Water Treatment Water Distribution Wastewater Treatment Wastewater Collection	Class 4 Class 2 Class 2 Class 2
Grant McGorman <i>Lead Operator</i> <i>Cartier Regional Water Treatment Facility</i>	Water Treatment Water Distribution Wastewater Treatment Wastewater Collection	Class 4 Class 2 Class 2 Class 2
Jason Tanguay <i>Operator</i> <i>Cartier Regional Water Treatment Facility</i>	Water Treatment Water Distribution Wastewater Treatment Wastewater Collection	Class 3 Class 2 Class 1 Class 1
Parker Page <i>Operator</i> <i>Cartier Regional Water Treatment Facility</i>	Water Treatment Water Distribution Wastewater Treatment Wastewater Collection	Class 1 Class 1 Class 1 Class 1
Chris Laramée <i>Operator</i> <i>Cartier Regional Water Treatment Facility</i>	Water Treatment Water Distribution Wastewater Treatment Wastewater Collection	OIT OIT OIT OIT
David Epler <i>Lead Operator</i> <i>Headingley Regional Water Treatment Facility</i>	Water Treatment Water Distribution Wastewater Treatment Wastewater Collection	Class 4 Class 2 Class 2 Class 2
Colter Milne <i>Operator</i> <i>Headingley Regional Water Treatment Facility</i>	Water Treatment Water Distribution	Class 3 Class 2
Paige Jepsen <i>Operator</i> <i>Headingley Regional Water Treatment Facility</i>	Water Treatment Water Distribution	Class 2 Class 2
Travis Reinsch <i>Operator</i> <i>Headingley Regional Water Treatment Facility</i>	Water Treatment Water Distribution	Class 2 Class 2

*Facility classification and Operator certification falls under The Environment Act's Water and Wastewater Facility Operators Regulation.

2. 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 the water. As per the license issued under the *Drinking Water Safety Act*, the Cartier Regional Water Co-op must ensure that the water has a measurable amount of Free chlorine residual of at least:

- 0.5 mg/L in water entering the distribution system following a minimum contact time of 20 minutes
- 0.1 mg/L at all times at any point in the water distribution system

2.1. Type of disinfection system used:

The Cartier and Headingley Regional Water Treatment Facilities disinfect by adding chlorine gas to the treated water via Regal brand gas chlorinator systems. Sodium Hypochlorite can also be added to all the reservoirs if and when required.

2.2. Equipment redundancy and monitoring requirements:

As required by the *Drinking Water Safety Act*, the Cartier and Headingley Regional Water Treatment Facilities ensure that continuous disinfection is maintained at the facilities by keeping in stock all spare parts required for the chlorination systems. As an additional backup, a complete spare chlorinator is also kept at the facilities. At the Cartier WTF, two identical trains of UF and RO membranes are in place, each RO with a capacity of 30 liters per second. At the Headingley WTF, 3 identical trains of UF and RO membranes are in place, each RO with a capacity of 50 liters per second.

Disinfectant residuals are monitored continuously, capturing readings every 5 minutes at the Water Treatment facilities and at the Reservoirs. Residuals are also monitored on a regular basis when water samples are taken for bacterial analysis in the distribution system and recorded on the appropriate monitoring forms. Monthly chlorination report forms are sent into the regional Drinking Water Officer at the end of each month.

2.3. Disinfectant residual overall performance / results:

The Cartier Regional Water System has met all regulatory requirements in 2022 for monitoring and reporting disinfection residuals leaving the Water Treatment Facilities and in the distribution system.

3. List of Water Quality Standards:

The Province of Manitoba has adopted a number of water quality standards from the [Guidelines for Canadian Drinking Water Quality](#) developed by Health Canada. The health-based parameters express the maximum acceptable concentration. Concentration values in excess constitute a health-related issue and require corrective actions. The 2022 results for the Cartier and Headingley Regional Water Systems are summarized in the following tables:

Table 3 - Cartier WTF (36.00) Chemistry Results 2022

<u>Parameter</u>	<u>Standard</u>	<u>Frequency</u>	<u>Test Results</u>
Bacterial; TC & EC **	0 TC, 0 EC	Weekly	100 % passed
Disinfectant Residual	WTF (> 0.5 mg/L)	Continuously	100 % compliance
“	Distribution (> 0.1 mg/L)	Continuously	100 % compliance
Turbidity	0.10 NTU *	Continuously	100 % compliance
Lead	0.005 mg/L	Annually	See appendix G
Fluoride	1.5 mg/L	“	“
Aluminum	0.1 mg/L	“	“
Arsenic	0.01 mg/L	“	“
Antimony	0.006 mg/L	“	“
Barium	2 mg/L	“	“
Boron	5 mg/L	“	“
Cadmium	0.005 mg/L	“	“
Chromium	0.05 mg/L	“	“
Copper	1 mg/L	“	“
Iron	0.30 mg/L	Regularly	“
Manganese	0.02 mg/L	“	“
Nitrate	As Nitrogen; 10 mg/L	“	“
Selenium	0.05 mg/L	“	“
Uranium	0.02 mg/L	“	“
Trihalomethane (THM) ***	0.100 mg/L	Quarterly	See appendix F
Haloacetic Acids (HAA's) ****	0.08 mg/L	Quarterly	See appendix F

* NTU (Nephelometric turbidity unit)

** Bacterial testing: The raw water (untreated surface water), the treated water (leaving the water treatment facility) and the water in the distribution system is tested bi-weekly for the presence of Total Coliform (TC) and *E. coli* (EC) bacteria. If these bacteria are present in the water, it is an indication that disease-causing organisms may also be present. Please see Appendix A, B, C, D, & E for a summary of the results.

*** THM: Trihalomethanes are formed when chlorine reacts with naturally occurring organic matter in the water. Studies have shown a link between high levels of THM's and Cancer. For that reason, the province has set a health-based standard for THM's of 0.100 mg/L. The THM standard is based on an average of four samples per year. THM levels in four locations in the distribution system are tested on a quarterly basis every year. Please see Appendix F for a summary of the results.

****HAA: Haloacetic Acids are formed when chlorine reacts with naturally occurring organic matter in the water. Studies have shown a link between high levels of HAA's and Cancer. For that reason, the province has set a health-based standard for HAA's of 0.08 mg/L. The HAA standard is based on an average of four samples per year. HAA levels in four locations in the distribution system are tested on a quarterly basis every year. Please see Appendix F for a summary of the results.

A copy of the annual lab results can be found on our website at [Cartier WTF Chemistry](#)

Table 4 – Headingley WTF (89.40) Chemistry Results 2022

<u>Parameter</u>	<u>Standard</u>	<u>Frequency</u>	<u>Test Results</u>
Bacterial; TC & EC **	0 TC, 0 EC	Biweekly	100 % passed
Disinfectant Residual	WTF (> 0.5 mg/L)	Continuously	100 % compliance
“	Distribution (> 0.1mg/L)	Continuously	100 % compliance
Turbidity	0.10 NTU *	Continuously	100 % compliance
Lead	0.005 mg/L	Annually	See appendix H
Fluoride	1.5 mg/L	“	“
Aluminum	0.1 mg/L	“	“
Arsenic	0.01 mg/L	“	“
Antimony	0.006 mg/L	“	“
Barium	2 mg/L	“	“
Boron	5 mg/L	“	“
Cadmium	0.005 mg/L	“	“
Chromium	0.05 mg/L	“	“
Copper	1 mg/L	“	“
Iron	0.30 mg/L	Regularly	“
Manganese	0.02 mg/L	“	“
Nitrate	As Nitrogen; 10 mg/L	“	“
Selenium	0.05 mg/L	“	“
Uranium	0.02 mg/L	“	“
Trihalomethane (THM) ***	0.100 mg/L	Quarterly	See appendix F
Haloacetic Acids (HAA's) ****	0.08 mg/L	Quarterly	See appendix F

* NTU (Nephelometric turbidity unit)

** Bacterial testing: The raw water (untreated surface water), the treated water (leaving the water treatment facility) and the water in the distribution system is tested bi-weekly for the presence of Total Coliform (TC) and *E. coli* (EC) bacteria. If these bacteria are present in the water, it is an indication that disease-causing organisms may also be present. Please see Appendix A, B, C, D, & E for a summary of the results.

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****HAA: Haloacetic Acids are formed when chlorine reacts with naturally occurring organic matter in the water. Studies have shown a link between high levels of HAA's and Cancer. For that reason, the province has set a health-based standard for HAA's of 0.08 mg/L. The HAA standard is based on an average of four samples per year. HAA levels in four locations in the distribution system are tested on a quarterly basis every year. Please see Appendix F for a summary of the results.

A copy of the annual lab results can be found on our website at [Headingley WTF Chemistry](#)

Table 5 – Water Quality and Treatment Standards – Peony Farm Reservoir (PWS 162.75)

Parameter	Quality Standard
Total Coliform	Less than one total coliform bacteria detectable per 100 mL in all distributed water
E. coli	Less than one E. coli bacteria detectable per 100 mL in all distributed water
Chlorine residual	A free chlorine residual of at least 0.10 mg/L at all times at any point in the distribution system
Total trihalomethanes (THMs)	Less than or equal to 0.10 mg/L as locational annual average of quarterly samples – Sampled Every 2 Years
Total Haloacetic acids (HAAs)	Less than or equal to 0.08 mg/L as locational annual average of quarterly samples – Sampled Every 2 Years
Total Metals and Manganese (Distribution System)	One sample every two years at a mid-point in the distribution system
Lead	Less than or equal to 0.005 mg/L in the water distribution system – Sampling done upon direction of the DWO

A summary of the analysis for each of these parameters can be found on the annual water system report for the city of Portage la Prairie. A link to the City of Portage La Prairie annual water system report can be found at [Water & Sewer - City of Portage la Prairie](#)

3.1 Result improvement

The Cartier Regional Water Co-op has been monitoring Trihalomethanes (THM) for the past several years and has met the Provincial and Federal guidelines. The THM standard of 0.1 mg/L is based on a running average of quarterly samples and the health risks associated with elevated THM's are based on lifetime exposure. The average THM result for 2022 was below the 0.100 mg/L regulation, with the exception of the Peony Farm (162.75) service area.

4. Water System Incidents and Corrective Actions

There were no major water system incidents in 2022. Corrective actions were taken and reported as required for normal minor variations during the course of routine operations.

5. Additional Records Required

As part of Manitoba Health's fluoridation program, which is funded by the Manitoba Health, Seniors and Active Living, the Cartier WTF (36.00) collects water samples daily from the treated water reservoir and is tested on-site. Daily fluoride results are recorded, and a 14-day composite sample is submitted bi-weekly for analysis. The recommended level of fluoride in drinking water is 0.70 mg/L and the operating range set by Manitoba Health is 0.50-0.90 mg/L.

6. *Emergencies, Compliance Issues and Operational Issues*

In 2022, no Emergencies or Operational Issues occurred for the Cartier (36.00) or Headingley Regional Water System (89.40). The annual inspection letter identified a few non-compliance incidents. Headingley Regional Water System (89.40) was non-compliant for failure to take and/or record turbidity at the same time and location as the bacteriological distribution system sampling for the first sampling period (January 11th) of 2022. This is due to the region relying on the local certified distribution operators to collect these samples for our community code. Testing equipment for this parameter at each facility is currently not available and the Headingley Regional staff has taken over the testing at all facilities since.

The Peony Farm (162.75) service area was non-compliance with treatment standards for THM due to no treatment barrier. The 2022 average THM result was 0.10588 mg/L, exceeding the regulatory limit of 0.100 mg/L. The only tool we have to control THM's in the distribution system is to flush the distribution system seasonally. We have no control over the treatment process of the water that receives into the Peony Farm Reservoir.

7. *Drinking Water Safety Orders on your System and Actions Taken in Response*

In 2022, no Drinking Water Safety Orders were issued for the Cartier or Headingley Regional Water Systems.

8. *Boil Water Advisories Issued and Actions Taken in Response*

In 2022, no Boil Water Advisories were issued for the Cartier or Headingley Regional Water System.

9. *Warnings Issued 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 Cartier and Headingley Regional Water System in 2022.

10. *Major Expenses Incurred*

Upgrades and Repairs

Cartier WTF:

- Fannystelle Reservoir water break and repair – \$7,411.43
- Caustic Soda fill line improvements – \$4,099.90
- Install VFD and Milltronics at River Barrel – \$12,741.12
- River Pump Rental due to intake problems – \$23,681.10
- Cartier WTF raw water valve replacement – \$8,227
- Dominion Divers to clean River intake – \$4,830.00
- Replacement of Forklift batteries – \$10,745

- Oakville Reservoir replacement influent valve – \$10,976.00

Headingley WTF

- Headingley WTF UF CIP Pump Rebuild – ~\$6000
- Headingley WTF UF CIP Pump Replacement – ~\$15,000
- Headingley WTF UF #3 Replacement Stainless pipe headers - ~\$5000
- H.C.C. Water main leak repair – ~\$9000
- Headingley WTF UF #2 Feed Pump VFD Replacement – ~\$25,000
- St. Francois Xavier Reservoir DP2 VFD replacement - ~\$5000
- New UF #3 Membranes – ~\$228,000
- Various Facility HVAC Improvements – ~\$5000

11. *Future System Expansion and/or Increased Production*

Elie Reservoir - In early 2022, the new Elie Reservoir was fully commissioned and online. The old facility will be decommissioned. This facility is built to satisfy RM development and fire protection needs

Elie By-pass - A by-pass distribution line was installed and completed and in service

System Capacity Study & St. Eustache Reservoir Upgrade Study - The CRWC is currently undergoing a comprehensive Capacity Study for the entire system to review its current and future capacity to service the Co-op region. Under the same agreement, an upgrade study for the St. Eustache reservoir was completed. Final decisions on how to proceed on providing better service to the town of St. Eustache, MB are still ongoing. The RM of W.S.P. and the CenterPort area in the RM of Rosser are the fastest growing areas that the CRWC services

Membrane Fouling Study – WSP Engineering will continue the second phase of the membrane fouling study. A pilot plant has been constructed and alternate production and cleaning strategies continue to be tested

Cartier Water Treatment Plant Facilities Upgrade – Equipment no longer in service will be removed from the Cartier WTF, and a new lunchroom and office facilities are scheduled to be constructed in 2023

SCADA Upgrade – CRWC continues with a SCADA and computer upgrade for 2023

Headingley WTF – a set of UF Membranes purchased in early 2022 were installed in December of 2022 to return UF treatment production capacity back to design levels

The bulk Truck-fill water rate will increase from \$3.91 per cubic meter in 2022 to \$4.10 per cubic meter as of April 1, 2023.

Appendix A: Cartier WTF 36.00 2022 Bacteriological Results

Date Sampled	Sample Identification	TC	EC	Free Cl2	Total Cl2	Turbidity
4-Jan-22	CARTIER REGIONAL 1 - RAW	14	0	-	-	3.400
4-Jan-22	CARTIER REGIONAL 2 - TREATED	0	0	1.68	1.81	0.030
4-Jan-22	CARTIER REGIONAL 3 - DIST @ ST. EUSTACHE RES IN	0	0	1.73	2.00	0.070
4-Jan-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.56	1.67	0.070
4-Jan-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.63	1.82	0.090
4-Jan-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.46	1.64	0.070
4-Jan-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.46	1.69	0.070
18-Jan-22	CARTIER REGIONAL 1 - RAW	6	0	-	-	3.590
18-Jan-22	CARTIER REGIONAL 2 - TREATED	0	0	1.37	1.58	0.066
18-Jan-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.44	1.60	0.060
18-Jan-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.48	1.68	0.060
18-Jan-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.36	1.61	0.090
18-Jan-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.32	1.52	0.060
18-Jan-22	CARTIER REGIONAL 3- DIST @ -----> FORTIER BOOSTER	0	0	1.41	1.60	0.070
31-Jan-22	CARTIER REGIONAL 1 - RAW	4	0	-	-	3.410
31-Jan-22	CARTIER REGIONAL 2 - TREATED	0	0	1.39	1.54	0.039
31-Jan-22	CARTIER REGIONAL 3 - DIST @ OAKVILLE RESERVOIR IN	0	0	1.26	1.52	0.040
31-Jan-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.37	1.58	0.080
31-Jan-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.42	1.61	0.080
31-Jan-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.26	1.55	0.090
31-Jan-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.22	1.50	0.070
31-Jan-22	CARTIER REGIONAL 1 - RAW - UF BREAK TANK	0	0	0.37	0.47	0.100
15-Feb-22	CARTIER REGIONAL 1 - RAW	8	0	-	-	5.880
15-Feb-22	CARTIER REGIONAL 2 - TREATED	0	0	1.37	1.58	0.037
15-Feb-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE RES IN	0	0	1.33	1.49	0.062
15-Feb-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.39	1.48	0.070
15-Feb-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.38	1.46	0.060
15-Feb-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.33	1.46	0.084
15-Feb-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.34	1.50	0.092
1-Mar-22	CARTIER REGIONAL 1 - RAW	11	0	-	-	7.600
1-Mar-22	CARTIER REGIONAL 2 - TREATED	0	0	1.49	1.65	0.046
1-Mar-22	CARTIER REGIONAL 3 - DIST - ELIE RES IN	0	0	1.51	1.71	0.070
1-Mar-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.49	1.67	0.090
1-Mar-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.49	1.67	0.050
1-Mar-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.42	1.60	0.080
1-Mar-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.30	1.49	0.040
15-Mar-22	CARTIER REGIONAL 1 - RAW	10	1	-	-	8.470
15-Mar-22	CARTIER REGIONAL 2 - TREATED	0	0	1.52	1.71	0.079

15-Mar-22	CARTIER REGIONAL 3 - DIST @ ST. EUSTACHE RES IN	0	0	1.68	1.87	0.060
15-Mar-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.50	1.73	0.050
15-Mar-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.50	1.67	0.040
15-Mar-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.38	1.55	0.080
15-Mar-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.27	1.59	0.060
29-Mar-22	CARTIER REGIONAL 1 - RAW	10	0	-	-	8.080
29-Mar-22	CARTIER REGIONAL 2 - TREATED	0	0	1.59	1.77	0.047
29-Mar-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.61	1.78	0.110
29-Mar-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.60	1.87	0.080
29-Mar-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.66	1.88	0.100
29-Mar-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.50	1.73	0.090
29-Mar-22	CARTIER REGIONAL 3- DIST @ -----> ELM BANK BOOSTER	0	0	1.46	1.64	0.090
12-Apr-22	CARTIER REGIONAL 1 - RAW	Present	Absent	-	-	9.580
12-Apr-22	CARTIER REGIONAL 2 - TREATED	Absent	Absent	1.59	1.78	0.044
12-Apr-22	CARTIER REGIONAL 3 - DIST @ OAKVILLE RESERVOIR IN	Absent	Absent	1.21	1.47	0.100
12-Apr-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	Absent	Absent	1.53	1.67	0.060
12-Apr-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	Absent	Absent	1.50	1.65	0.080
12-Apr-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	Absent	Absent	1.53	1.66	0.080
12-Apr-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	Absent	Absent	1.17	1.38	0.100
12-Apr-22	CARTIER REGIONAL 1 - RAW - UF BREAK TANK	Absent	Absent	0.27	0.55	0.110
26-Apr-22	CARTIER REGIONAL 1 - RAW	16	0	-	-	12.300
28-Apr-22	CARTIER REGIONAL 2 - TREATED	0	0	1.61	1.75	0.054
26-Apr-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE RES IN	0	0	1.52	1.67	0.080
26-Apr-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.56	1.75	0.080
26-Apr-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.59	1.73	0.070
26-Apr-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.47	1.61	0.080
26-Apr-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.61	1.76	0.070
10-May-22	CARTIER REGIONAL 1 - RAW	32	8	-	-	14.600
10-May-22	CARTIER REGIONAL 2 - TREATED	0	0	0.96	1.09	0.038
10-May-22	CARTIER REGIONAL 3 - DIST - ELIE RES IN	0	0	1.18	1.42	0.060
10-May-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.50	1.70	0.040
10-May-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.49	1.70	0.080
10-May-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.48	1.61	0.070
10-May-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.48	1.61	0.060
24-May-22	CARTIER REGIONAL 1 - RAW	130	4	-	-	30.100
24-May-22	CARTIER REGIONAL 2 - TREATED	0	0	1.47	1.58	0.035
24-May-22	CARTIER REGIONAL 3 - DIST @ ST. EUSTACHE RES IN	0	0	1.40	1.51	0.090
24-May-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.25	1.52	0.080
24-May-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.35	1.48	0.070
24-May-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.69	1.73	0.090
24-May-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.38	1.58	0.090
7-Jun-22	CARTIER REGIONAL 1 - RAW	130	41	-	-	14.500
7-Jun-22	CARTIER REGIONAL 2 - TREATED	0	0	1.18	1.30	0.039
7-Jun-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.16	1.33	0.070

7-Jun-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.04	1.17	0.080
7-Jun-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.01	1.17	0.050
7-Jun-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.12	1.31	0.060
7-Jun-22	CARTIER REGIONAL 3- DIST @ -----> FORTIER BOOSTER	0	0	1.14	1.28	0.060
21-Jun-22	CARTIER REGIONAL 1 - RAW	>200	25	-	-	9.600
21-Jun-22	CARTIER REGIONAL 2 - TREATED	0	0	1.23	1.33	0.049
21-Jun-22	CARTIER REGIONAL 3 - DIST @ ELMBANK IN	0	0	1.43	1.59	0.090
21-Jun-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.29	1.45	0.090
21-Jun-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.34	1.50	0.100
21-Jun-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.36	1.46	0.090
21-Jun-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.41	1.64	0.090
5-Jul-22	CARTIER REGIONAL 1 - RAW	165	32	-	-	19.100
5-Jul-22	CARTIER REGIONAL 2 - TREATED	0	0	1.35	1.46	0.052
5-Jul-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE RES IN	0	0	1.11	1.24	0.080
5-Jul-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.15	1.33	0.080
5-Jul-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	0.97	1.14	0.090
5-Jul-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.11	1.24	0.090
5-Jul-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.29	1.42	0.090
19-Jul-22	CARTIER REGIONAL 1 - RAW	present	present	-	-	29.600
19-Jul-22	CARTIER REGIONAL 2 - TREATED	absent	absent	1.17	1.30	0.042
19-Jul-22	CARTIER REGIONAL 3 - DIST - ELIE RES IN	absent	absent	1.16	1.33	0.040
19-Jul-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.22	1.33	0.040
19-Jul-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	0.97	1.14	0.060
19-Jul-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.07	1.17	0.060
19-Jul-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.21	1.32	0.080
2-Aug-22	CARTIER REGIONAL 1 - RAW	>200	5	-	-	13.000
2-Aug-22	CARTIER REGIONAL 2 - TREATED	0	0	1.56	1.66	0.067
2-Aug-22	CARTIER REGIONAL 3 - DIST @ ST. EUSTACHE RES IN	0	0	1.46	1.64	0.080
2-Aug-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.33	1.49	0.070
2-Aug-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.18	1.28	0.080
2-Aug-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.03	1.37	0.080
2-Aug-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.18	1.40	0.090
16-Aug-22	CARTIER REGIONAL 1 - RAW	>200	34	-	-	10.800
16-Aug-22	CARTIER REGIONAL 2 - TREATED	0	0	1.41	1.57	0.053
16-Aug-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.32	1.48	0.070
16-Aug-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.03	1.20	0.050
16-Aug-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.08	1.20	0.050
16-Aug-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.26	1.39	0.050
16-Aug-22	CARTIER REGIONAL 3- DIST @ -----> ELM BANK BOOSTER	0	0	1.16	1.29	0.050
30-Aug-22	CARTIER REGIONAL 1 - RAW	>200	50	-	-	8.810
30-Aug-22	CARTIER REGIONAL 2 - TREATED	0	0	1.53	1.67	0.042
30-Aug-22	CARTIER REGIONAL 3 - DIST @ OAKVILLE RESERVOIR IN	0	0	1.24	1.42	0.060
30-Aug-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.29	1.46	0.060

30-Aug-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.08	1.20	0.060
30-Aug-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.11	1.27	0.050
30-Aug-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.20	1.32	0.080
13-Sep-22	CARTIER REGIONAL 1 - RAW	>200	32	-	-	4.890
13-Sep-22	CARTIER REGIONAL 2 - TREATED	0	0	1.53	1.68	0.040
13-Sep-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE RES IN	0	0	1.21	1.32	0.100
13-Sep-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.46	1.62	0.080
13-Sep-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.29	1.40	0.090
13-Sep-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.19	1.29	0.090
13-Sep-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.34	1.49	0.080
27-Sep-22	CARTIER REGIONAL 1 - RAW	>200	11	-	-	2.180
27-Sep-22	CARTIER REGIONAL 2 - TREATED	0	0	1.65	1.83	0.043
27-Sep-22	CARTIER REGIONAL 3 - DIST - ELIE RES IN	0	0	1.50	1.70	0.070
27-Sep-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.58	1.71	0.090
27-Sep-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.37	1.53	0.070
27-Sep-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.38	1.52	0.100
27-Sep-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.02	1.22	0.100
11-Oct-22	CARTIER REGIONAL 1 - RAW	109	4	-	-	1.67
11-Oct-22	CARTIER REGIONAL 2 - TREATED	0	0	1.85	2.00	0.038
11-Oct-22	CARTIER REGIONAL 3 - DIST @ ST. EUSTACHE RES IN	0	0	1.69	1.93	0.050
11-Oct-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.41	1.64	0.070
11-Oct-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.51	1.92	0.040
11-Oct-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.48	1.74	0.060
11-Oct-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.46	1.79	0.070
25-Oct-22	CARTIER REGIONAL 1 - RAW	109	8	-	-	2.610
25-Oct-22	CARTIER REGIONAL 2 - TREATED	0	0	1.81	2.00	0.020
25-Oct-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.72	1.90	0.100
25-Oct-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.62	1.86	0.100
25-Oct-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.42	1.63	0.040
25-Oct-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.48	1.66	0.080
25-Oct-22	CARTIER REGIONAL 3- DIST @ -----> FORTIER BOOSTER	0	0	1.66	1.81	0.100
8-Nov-22	CARTIER REGIONAL 1 - RAW	22	2	-	-	3.330
8-Nov-22	CARTIER REGIONAL 2 - TREATED	0	0	1.94	2.20	0.048
8-Nov-22	CARTIER REGIONAL 3 - DIST @ OAKVILLE RESERVOIR IN	0	0	1.59	1.72	0.100
8-Nov-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.11	1.73	0.070
8-Nov-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.64	1.83	0.100
8-Nov-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.57	1.73	0.100
8-Nov-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.43	1.63	0.070
22-Nov-22	CARTIER REGIONAL 1 - RAW	0	0	-	-	3.180
22-Nov-22	CARTIER REGIONAL 2 - TREATED	0	0	2.00	2.00	0.044
22-Nov-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE RES IN	0	0	1.77	1.94	0.060
22-Nov-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.91	2.15	0.090
22-Nov-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.57	1.62	0.060
22-Nov-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.68	1.86	0.100

22-Nov-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.79	2.06	0.100
6-Dec-22	CARTIER REGIONAL 1 - RAW	0	0	-	-	3.390
6-Dec-22	CARTIER REGIONAL 2 - TREATED	0	0	1.74	1.95	0.054
6-Dec-22	CARTIER REGIONAL 3 - DIST - ELIE RES IN	0	0	2.03	2.20	0.100
6-Dec-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.65	1.81	0.080
6-Dec-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.47	1.66	0.080
6-Dec-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.42	1.60	0.110
6-Dec-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.42	1.63	0.100
19-Dec-22	CARTIER REGIONAL 1 - RAW	2	0	-	-	5.970
19-Dec-22	CARTIER REGIONAL 2 - TREATED	0	0	1.64	1.89	0.068
19-Dec-22	CARTIER REGIONAL 3 - DIST @ ST. EUSTACHE RES IN	0	0	1.68	1.89	0.070
19-Dec-22	CARTIER REGIONAL 3 - DIST - ST. EUSTACHE OUT	0	0	1.49	1.69	0.010
19-Dec-22	CARTIER REGIONAL 3 - DIST - ELIE OUT	0	0	1.39	1.58	0.076
19-Dec-22	CARTIER REGIONAL 3 - DIST - FANNYSTELLE OUT	0	0	1.32	1.50	0.098
19-Dec-22	CARTIER REGIONAL 3 - DIST - OAKVILLE OUT	0	0	1.36	1.59	0.075

Appendix B: Headingley WTF 89.40 2022 Bacteriological Result

Date Sampled	Sample Identification	TC	EC	Free CI2	Total CI2	Turbidity
11-Jan-22	HEADINGLEY REGIONAL 1 - RAW	109	1	-	-	4.67
11-Jan-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.34	1.44	0.06
11-Jan-22	HEADINGLEY REGIONAL 3 - DIST @ -----> HDLY RES. IN	0	0	1.47	1.53	-
11-Jan-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.43	1.49	-
11-Jan-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.30	1.38	-
11-Jan-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.39	1.43	-
11-Jan-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.10	1.20	-
11-Jan-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.36	1.38	-
25-Jan-22	HEADINGLEY REGIONAL 1 - RAW	22	1	-	-	5.18
25-Jan-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.22	1.29	0.05
25-Jan-22	HEADINGLEY REGIONAL 3 - DIST @ -----> ROSSER RES IN	0	0	1.28	1.37	0.07
24-Jan-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.31	1.39	0.05
25-Jan-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.23	1.32	0.07
24-Jan-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.25	1.31	0.06
25-Jan-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.07	1.17	0.07
25-Jan-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.22	1.27	0.06
8-Feb-22	HEADINGLEY REGIONAL 1 - RAW	8	0	-	-	5.33
8-Feb-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.28	1.33	0.06
7-Feb-22	HEADINGLEY REGIONAL 3 - DIST @ -----> SFX RES IN	0	0	1.11	1.16	0.07
7-Feb-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.23	1.33	0.07
8-Feb-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.29	1.32	0.08

7-Feb-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.34	1.39	0.07
8-Feb-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.00	1.10	0.08
8-Feb-22	HEADINGLEY REGIONAL 1 - RAW - UF BREAK TANK	0	0	0.05	0.43	-
8-Feb-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.22	1.30	0.08
23-Feb-22	HEADINGLEY REGIONAL 1 - RAW	12	2	-	-	9.59
23-Feb-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.27	1.37	0.04
23-Feb-22	HEADINGLEY REGIONAL 3 - DIST @ -----> G.I. RES IN	0	0	1.18	1.24	0.04
23-Feb-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.30	1.43	0.05
23-Feb-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.29	1.35	0.06
22-Feb-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.30	1.35	0.05
23-Feb-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.93	1.03	0.06
23-Feb-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.26	1.32	0.07
8-Mar-22	HEADINGLEY REGIONAL 1 - RAW	15	1	-	-	11.9
8-Mar-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.26	1.33	0.06
7-Mar-22	HEADINGLEY REGIONAL 3 - DIST @ -----> HCC IN	0	0	1.35	1.45	0.06
8-Mar-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.28	1.36	0.04
8-Mar-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.37	1.41	0.06
7-Mar-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.35	1.39	0.08
8-Mar-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.96	1.03	0.07
8-Mar-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.32	1.40	0.08
22-Mar-22	HEADINGLEY REGIONAL 1 - RAW	118	0	-	-	12.5
22-Mar-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.31	1.37	0.05
21-Mar-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.31	1.39	0.05
22-Mar-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.28	1.30	0.05
21-Mar-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.31	1.35	0.06
22-Mar-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.00	1.07	0.08
22-Mar-22	HEADINGLEY REGIONAL 3 - DIST @ -----> HDLY W.W.T.P.	0	0	1.45	1.49	0.08
22-Mar-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.14	1.35	0.08
5-Apr-22	HEADINGLEY REGIONAL 1 - RAW	62	0	-	-	17.6
5-Apr-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.40	1.43	0.05
4-Apr-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.49	1.52	0.04
5-Apr-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.24	1.28	0.07
4-Apr-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.30	1.36	0.06
5-Apr-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.01	1.12	0.06
5-Apr-22	HEADINGLEY REGIONAL 3 - DIST @ -----> COOP GAS BAR	0	0	0.48	0.54	0.06
5-Apr-22	HEADINGLEY REGIONAL 1 - RAW - UF BREAK TANK	0	0	0.28	0.60	0.05
5-Apr-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.24	1.37	0.07
20-Apr-22	HEADINGLEY REGIONAL 1 - RAW	78	4	-	-	46.8
20-Apr-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.23	1.28	0.05
20-Apr-22	HEADINGLEY REGIONAL 3 - DIST @ -----> W.S.P. RES. IN	0	0	1.18	1.36	0.05
19-Apr-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.30	1.36	0.05
20-Apr-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.22	1.27	0.07

19-Apr-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.27	1.31	0.07
20-Apr-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.11	1.21	0.06
20-Apr-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.22	1.38	0.06
4-May-22	HEADINGLEY REGIONAL 1 - RAW	>200	9	-	-	112.0
4-May-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.34	1.40	0.06
3-May-22	HEADINGLEY REGIONAL 3 - DIST @ -----> HDLY RES IN	0	0	1.40	1.49	0.05
3-May-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.35	1.42	0.08
4-May-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.31	1.39	0.05
3-May-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.40	1.46	0.06
4-May-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.13	1.23	0.06
4-May-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.18	1.24	0.06
18-May-22	HEADINGLEY REGIONAL 1 - RAW	>200	0	-	-	74.9
18-May-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.45	1.54	0.06
18-May-22	HEADINGLEY REGIONAL 3 - DIST @ -----> ROSSER RES IN	0	0	1.53	1.63	0.10
18-May-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.47	1.54	0.08
18-May-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.36	1.44	0.07
17-May-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.46	1.50	0.08
18-May-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.07	1.17	0.07
18-May-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.14	1.23	0.06
31-May-22	HEADINGLEY REGIONAL 1 - RAW	>200	200	-	-	75.6
31-May-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.39	1.44	0.06
30-May-22	HEADINGLEY REGIONAL 3 - DIST @ -----> SFX RES IN	0	0	0.51	1.57	0.05
31-May-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.49	1.58	0.09
31-May-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.36	1.54	0.09
30-May-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.48	1.54	0.05
31-May-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.20	1.31	0.07
31-May-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.35	1.41	0.08
14-Jun-22	HEADINGLEY REGIONAL 1 - RAW	>200	33	-	-	50.3
14-Jun-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.34	1.38	0.06
14-Jun-22	HEADINGLEY REGIONAL 3 - DIST @ -----> G.I. RES IN	0	0	1.25	1.31	0.05
13-Jun-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.48	1.54	0.08
14-Jun-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.46	1.51	0.06
13-Jun-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.51	1.57	0.11
14-Jun-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.11	1.19	0.07
14-Jun-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.42	1.48	0.08
29-Jun-22	HEADINGLEY REGIONAL 1 - RAW	>200	2	-	-	31.8
29-Jun-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.41	1.47	0.09
28-Jun-22	HEADINGLEY REGIONAL 3 - DIST @ -----> H.C.C. RES IN	0	0	1.58	1.62	0.09
28-Jun-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.47	1.50	0.11
29-Jun-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.35	1.42	0.12
28-Jun-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.39	1.42	0.11
29-Jun-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.98	1.06	0.06

29-Jun-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.37	1.42	0.10
13-Jul-22	HEADINGLEY REGIONAL 1 - RAW	>200	2	-	-	37.7
13-Jul-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.33	1.36	0.07
13-Jul-22	HEADINGLEY REGIONAL 3 - DIST @ -----> HDLY W.W.T.P.	0	0	1.23	1.30	0.06
12-Jul-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.40	1.43	0.13
13-Jul-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.31	1.35	0.10
12-Jul-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.42	1.43	0.11
13-Jul-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.93	1.00	0.09
13-Jul-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.28	1.42	0.11
26-Jul-22	HEADINGLEY REGIONAL 1 - RAW	>200	1	-	-	24.4
26-Jul-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.34	1.39	0.10
25-Jul-22	HEADINGLEY REGIONAL 3 - DIST @ -----> COOP GAS BAR	0	0	0.65	0.71	0.06
25-Jul-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.34	1.43	0.12
26-Jul-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.12	1.17	0.10
25-Jul-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.32	1.36	0.11
26-Jul-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.90	0.96	0.07
26-Jul-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.28	1.34	0.12
9-Aug-22	HEADINGLEY REGIONAL 1 - RAW	>200	2	-	-	44.3
9-Aug-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.37	1.38	0.09
9-Aug-22	HEADINGLEY REGIONAL 3 - DIST @ -----> W.S.P. RES. IN	0	0	1.29	1.35	0.09
9-Aug-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.38	1.44	0.11
9-Aug-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.23	1.28	0.10
8-Aug-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.33	1.37	0.14
9-Aug-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.90	0.98	0.07
9-Aug-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.11	1.16	0.18
24-Aug-22	HEADINGLEY REGIONAL 1 - RAW	200	4	-	-	13.6
24-Aug-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.33	1.36	0.11
22-Aug-22	HEADINGLEY REGIONAL 3 - DIST @ -----> W.S.P. RES. IN	0	0	1.33	1.39	0.16
24-Aug-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.40	1.43	0.10
24-Aug-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.29	1.34	0.22
24-Aug-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.45	1.48	0.14
24-Aug-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.86	0.95	0.06
24-Aug-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.28	1.34	0.17
7-Sep-22	HEADINGLEY REGIONAL 1 - RAW	>200	74	-	-	13.9
7-Sep-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.39	1.44	0.08
6-Sep-22	HEADINGLEY REGIONAL 3 - DIST @ -----> HDLY RES IN	0	0	1.41	1.45	0.08
6-Sep-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.40	1.47	0.12
7-Sep-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.16	1.22	0.11
6-Sep-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.42	1.48	0.10
7-Sep-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.80	0.89	0.08
7-Sep-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.31	1.38	0.11
20-Sep-22	HEADINGLEY REGIONAL 1 - RAW	>200	200	-	-	16.0

20-Sep-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.35	1.41	0.06
19-Sep-22	HEADINGLEY REGIONAL 3 - DIST @ -----> ROSSER RES IN	0	0	1.37	1.45	0.09
19-Sep-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.41	1.47	0.08
20-Sep-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.29	1.37	0.09
19-Sep-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.33	1.39	0.21
20-Sep-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.83	0.90	0.07
20-Sep-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.21	1.24	0.23
5-Oct-22	HEADINGLEY REGIONAL 1 - RAW	>200	>200	-	-	12.3
5-Oct-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.32	1.37	0.07
5-Oct-22	HEADINGLEY REGIONAL 3 - DIST @ -----> H.C.C. RES IN	0	0	1.37	1.39	0.10
5-Oct-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.32	1.38	0.11
5-Oct-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.26	1.33	0.08
4-Oct-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.37	1.42	0.07
5-Oct-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	2.00	2.19	0.21
5-Oct-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.27	1.34	0.09
18-Oct-22	HEADINGLEY REGIONAL 1 - RAW	66	22	-	-	3.98
18-Oct-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	0.99	1.01	0.07
17-Oct-22	HEADINGLEY REGIONAL 3 - DIST @ -----> G.I. RES IN	0	0	1.21	1.30	0.06
17-Oct-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.23	1.30	0.11
18-Oct-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.07	1.14	0.12
17-Oct-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.08	1.14	0.10
18-Oct-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	1.29	1.35	0.16
18-Oct-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.14	1.21	0.17
1-Nov-22	HEADINGLEY REGIONAL 1 - RAW	95	41	-	-	13.6
1-Nov-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.45	1.57	0.06
1-Nov-22	HEADINGLEY REGIONAL 3 - DIST @ -----> HDLY W.W.T.P.	0	0	1.32	1.39	0.08
1-Nov-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.60	1.72	0.12
1-Nov-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.40	1.50	0.13
31-Oct-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.44	1.52	0.08
1-Nov-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.98	1.08	0.13
1-Nov-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.04	1.13	0.13
15-Nov-22	HEADINGLEY REGIONAL 1 - RAW	62	21	-	-	13.9
15-Nov-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.68	1.80	0.07
14-Nov-22	HEADINGLEY REGIONAL 3 - DIST @ -----> COOP GAS BAR	0	0	0.46	0.51	0.16
14-Nov-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.69	1.82	0.07
15-Nov-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.49	1.61	0.08
14-Nov-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.55	1.69	0.06
15-Nov-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.84	0.92	0.11
15-Nov-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.51	1.63	0.11
29-Nov-22	HEADINGLEY REGIONAL 1 - RAW	22	1	-	-	10.5
29-Nov-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.47	1.57	0.07
29-Nov-22	HEADINGLEY REGIONAL 3 - DIST @ -----> W.S.P. RES. IN	0	0	1.69	1.85	0.17

28-Nov-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.58	1.67	0.08
29-Nov-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.43	1.53	0.09
28-Nov-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.54	1.63	0.07
29-Nov-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.88	0.94	0.12
29-Nov-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.25	1.33	0.12
13-Dec-22	HEADINGLEY REGIONAL 1 - RAW	21	2	-	-	10.4
13-Dec-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.55	1.65	0.07
13-Dec-22	HEADINGLEY REGIONAL 3 - DIST @ -----> HDLY RES IN	0	0	1.64	1.74	0.06
13-Dec-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.56	1.64	0.06
13-Dec-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.08	1.15	0.07
12-Dec-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.40	1.46	0.08
13-Dec-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.97	1.11	0.09
13-Dec-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.37	1.47	0.13
28-Dec-22	HEADINGLEY REGIONAL 1 - RAW	9	2	-	-	10.2
28-Dec-22	HEADINGLEY REGIONAL 2 - TREATED	0	0	1.66	1.75	0.07
28-Dec-22	HEADINGLEY REGIONAL 3 - DIST @ -----> ROSSER RES IN	0	0	1.48	1.58	0.10
27-Dec-22	HEADINGLEY REGIONAL 3 - DIST - HDLY OUT	0	0	1.66	1.72	0.09
28-Dec-22	HEADINGLEY REGIONAL 3 - DIST - ROSSER OUT	0	0	1.41	1.51	0.07
27-Dec-22	HEADINGLEY REGIONAL 3 - DIST - ST. FX OUT	0	0	1.34	1.55	0.09
28-Dec-22	HEADINGLEY REGIONAL 3 - DIST - GI OUT	0	0	0.96	1.08	0.08
28-Dec-22	HEADINGLEY REGIONAL 3 - DIST - WSP OUT	0	0	1.30	1.38	0.09

Appendix C: RM of Headingley 89.50 2022 Bacteriological Results

Date Sampled	Sample Identification	TC	EC	Free CI2	Total CI2
11-Jan-22	HEADINGLEY 3 - DIST @ --> HDLY SPORT SHOP	0	0	1.40	1.43
24-Jan-22	HEADINGLEY 3 - DIST @ --> MOTEL 6	0	0	1.27	1.34
7-Feb-22	HEADINGLEY 3 - DIST @ --> FLYING J	0	0	1.01	1.06
23-Feb-22	HEADINGLEY 3 - DIST @ --> COLUMBIA INSURANCE	0	0	1.22	1.27
7-Mar-22	HEADINGLEY 3 - DIST @ --> PHOENIX SCHOOL	0	0	1.28	1.33
21-Mar-22	HEADINGLEY 3 - DIST @ --> HDLY SPORT SHOP	0	0	1.21	1.37
4-Apr-22	HEADINGLEY 3 - DIST @ --> MATIX LUMBER	0	0	1.42	1.48
19-Apr-22	HEADINGLEY 3 - DIST @ --> NOVENTIS CREDIT UNION	0	0	1.27	1.33
4-May-22	HEADINGLEY 3 - DIST @ --> MOTEL 6	0	0	1.23	1.36
17-May-22	HEADINGLEY 3 - DIST @ --> COLUMBIA INSURANCE	0	0	1.45	1.51
30-May-22	HEADINGLEY 3 - DIST @ --> TAILLIEU CONST.	0	0	1.24	1.32
13-Jun-22	HEADINGLEY 3 - DIST @ --> FLYING J	0	0	1.25	1.32
28-Jun-22	HEADINGLEY 3 - DIST @ --> HDLY SPORT SHOP	0	0	1.47	1.49
12-Jul-22	HEADINGLEY 3 - DIST @ --> MATIX LUMBER	0	0	1.42	1.50
25-Jul-22	HEADINGLEY 3 - DIST @ --> MOTEL 6	0	0	1.20	1.22
8-Aug-22	HEADINGLEY 3 - DIST @ --> TAILLIEU CONST.	0	0	1.15	1.19
23-Aug-22	HEADINGLEY 3 - DIST @ --> NOVENTIS CREDIT UNION	0	0	1.23	1.27
6-Sep-22	HEADINGLEY 3 - DIST @ --> PHOENIX SCHOOL	0	0	1.24	1.28
19-Sep-22	HEADINGLEY 3 - DIST @ --> LIBRARY	0	0	1.38	1.44
4-Oct-22	HEADINGLEY 3 - DIST @ --> HDLY SPORT SHOP	0	0	1.18	1.37
17-Oct-22	HEADINGLEY 3 - DIST @ --> COLUMBIA INSURANCE	0	0	1.18	1.25
31-Oct-22	HEADINGLEY 3 - DIST @ --> MOTEL 6	0	0	1.46	1.56
15-Nov-22	HEADINGLEY 3 - DIST @ --> MATIX LUMBER	0	0	1.62	1.72
28-Nov-22	HEADINGLEY 3 - DIST @ --> ACCESS CREDIT UNION	0	0	1.37	1.45
13-Dec-22	HEADINGLEY 3 - DIST @ --> FLYING J	0	0	1.33	1.41
28-Dec-22	HEADINGLEY 3 - DIST @ --> MOTEL 6	0	0	1.54	1.62

Appendix D: RM of St. Francois Xavier 211.50 2022 Bacteriological Results

Date Sampled	Sample Identification	TC	EC	Free Cl2	Total Cl2
11-Jan-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> RM OFFICE	0	0	1.35	1.40
24-Jan-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> COUNTRY KIDS LEARNING CENTER	0	0	1.21	1.32
7-Feb-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> ESSO	0	0	1.24	1.32
22-Feb-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> COUNTRY STORE	0	0	1.31	1.36
7-Mar-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> RM OFFICE	0	0	1.38	1.43
21-Mar-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> COUNTRY KIDS LEARNING CENTER	0	0	1.32	1.38
4-Apr-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> VET CLINIC	0	0	1.29	1.31
19-Apr-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> CAISSE CREDIT UNION	0	0	1.26	1.29
3-May-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> ESSO	0	0	1.29	1.34
17-May-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> RM OFFICE	0	0	1.48	1.54
30-May-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> COUNTRY STORE	0	0	1.50	1.56
13-Jun-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> COUNTRY KIDS LEARNING CENTER	0	0	1.49	1.58
28-Jun-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> VET CLINIC	0	0	1.37	1.42
12-Jul-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> CAISSE CREDIT UNION	0	0	1.30	1.40
25-Jul-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> RM OFFICE	0	0	1.27	1.30
8-Aug-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> ESSO	0	0	1.31	1.35
23-Aug-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> COUNTRY STORE	0	0	1.39	1.42
6-Sep-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> SFX ELEMENTARY SCHOOL	0	0	1.17	1.20
19-Sep-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> RM OFFICE	0	0	1.39	1.43
4-Oct-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> COUNTRY KIDS LEARNING CENTER	0	0	1.30	1.38
17-Oct-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> VET CLINIC	0	0	1.05	1.08
31-Oct-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> COUNTRY STORE	0	0	1.39	1.45
14-Nov-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> ESSO	0	0	1.45	1.57
28-Nov-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> SFX ELEMENTARY SCHOOL	0	0	1.32	1.42
12-Dec-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> RM OFFICE	0	0	1.39	1.43
27-Dec-22	ST. FRANCOIS XAVIER 3 - DIST @ ---> COUNTRY STORE	0	0	1.46	1.55

Appendix E: Peony Farm Reservoir 162.75 2022 Bacteriological Results

Date Sampled	Sample Identification	TC	EC	Free Cl2	Total Cl2
10-Jan-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.31	1.66
10-Jan-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.14	0.29
24-Jan-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	0.97	1.32
24-Jan-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.16	0.31
2-Feb-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.48	1.59
2-Feb-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.28	0.46
22-Feb-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.10	1.30
22-Feb-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.27	0.55
7-Mar-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.16	1.41
7-Mar-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.13	0.28
21-Mar-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.44	1.55
21-Mar-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.29	0.41
4-Apr-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.41	1.64
4-Apr-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.15	0.29
22-Apr-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.12	1.47
20-Apr-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.14	0.28
2-May-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.24	1.51
2-May-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.16	0.28
16-May-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.11	1.35
16-May-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.12	0.34
30-May-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	0.82	1.23
30-May-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.19	0.31
13-Jun-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.22	1.50
13-Jun-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.43	0.56
4-Jul-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.66	1.84
28-Jun-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.40	0.64
11-Jul-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.43	1.82
11-Jul-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.47	0.91
27-Jul-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.49	1.92
27-Jul-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.37	0.87
8-Aug-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.34	1.71
8-Aug-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.30	0.53
22-Aug-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.14	1.42
22-Aug-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.29	0.67
6-Sep-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.37	1.59
6-Sep-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.42	0.54
19-Sep-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.36	1.67
19-Sep-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.21	0.42
4-Oct-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.22	1.49
4-Oct-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.19	0.40

17-Oct-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.19	1.64
17-Oct-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.11	0.48
31-Oct-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.22	1.56
31-Oct-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.13	0.38
14-Nov-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.59	2.04
14-Nov-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.17	0.36
28-Nov-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.42	1.86
28-Nov-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.14	0.29
13-Dec-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.28	1.82
13-Dec-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.11	0.30
28-Dec-22	PEONY FARM 3 - DIST - PF OUTGOING	0	0	1.72	2.20
28-Dec-22	PEONY FARM 3 - DIST - PP @ RINK	0	0	0.13	0.43

Appendix F: Cartier and Headingley Regional Water System THM and HAA Results

Disinfection By-product Report - THMs and HAAs

Water System Name: **Cartier Regional Water Co-op** Water System Code: **36.00**
 Year: **2022** Operator -in-charge (Print): **Danielle Vaillant/Grant McGorman**

Total Trihalomethanes (THMs) [mg/L]	
Quality Standard: Less than or equal to 0.10 mg/L as locational running annual average of quarterly samples	
Sampling Location #1: Oakville In	
1st Quarter	0.0202
2nd Quarter	0.0471
3rd Quarter	0.0993
4th Quarter	0.0355
Yearly Average (mg/L)	0.0505
Yearly Average (ug/L)	50.53
Sampling Location #2: Fannystelle In	
1st Quarter	0.0283
2nd Quarter	0.0350
3rd Quarter	0.1120
4th Quarter	0.0460
Yearly Average (mg/L)	0.0553
Yearly Average (ug/L)	55.33

Total Halo Acetic Acids (HAAs) [mg/L]	
Quality Standard: Less than or equal to 0.08 mg/L as locational running annual average of quarterly samples	
Sampling Location #1: Fortier Booster	
1st Quarter	0.0106
2nd Quarter	0.0362
3rd Quarter	0.0632
4th Quarter	0.0261
Yearly Average (mg/L)	0.0340
Yearly Average (ug/L)	34.03
Sampling Location #2: Elm Bank Booster	
1st Quarter	0.0108
2nd Quarter	0.0402
3rd Quarter	0.0672
4th Quarter	0.0305
Yearly Average (mg/L)	0.0372
Yearly Average (ug/L)	37.18

Disinfection By-product Report - THMs and HAAs

Water System Name: **Peony Farm** Water System Code: **162.75**
 Year: **2022** Operator -in-charge (Print): **Danielle Vaillant/Grant McGorman**

Total Trihalomethanes (THMs) [mg/L]	
Quality Standard: Less than or equal to 0.10 mg/L as locational running average of quarterly samples	
Sampling Location #1: Poplar Point Rink	
1st Quarter	0.0999
2nd Quarter	0.1120
3rd Quarter	0.1210
4th Quarter	0.0906
Yearly Average (mg/L)	0.10588
Yearly Average (ug/L)	105.88

Total Halo Acetic Acids (HAAs) [mg/L]	
Quality Standard: Less than or equal to 0.08 mg/L as Locational running average of quarterly samples	
Sampling Location #1: High Bluff Community Hall	
1st Quarter	0.0256
2nd Quarter	0.0756
3rd Quarter	0.0449
4th Quarter	0.0322
Yearly Average (mg/L)	0.04458
Yearly Average (ug/L)	44.58

Disinfection By-product Report - THMs and HAAs

Water System Name: Headingley Regional Water System Water System Code: 89.40

Year: 2022

Operator -in-charge (Print): Danielle Vaillant/Dave Epler

Total Trihalomethanes (THMs) [mg/L]	
Quality Standard: Less than or equal to 0.1 mg/L as Locational running average of quarterly samples	
Sampling Location #1: GROSSE ISLE IN	
1st Quarter	0.0357
2nd Quarter	0.0222
3rd Quarter	0.1020
4th Quarter	0.0555
Yearly Average (mg/L)	0.0539
Yearly Average (ug/L)	53.85
Sampling Location #2: WEST ST. PAUL IN	
1st Quarter	0.0022
2nd Quarter	0.0072
3rd Quarter	0.0574
4th Quarter	0.0096
Yearly Average (mg/L)	0.0191
Yearly Average (ug/L)	19.10

Total Halo Acetic Acids (HAAs) [mg/L]		
Quality Standard: Less than or equal to 0.08 mg/L as Locational running average of quarterly samples		
Sampling Location #1: SFX IN		
1st Quarter	0.0018	*
2nd Quarter	0.0025	
3rd Quarter	0.0029	
4th Quarter	0.0020	
Yearly Average (mg/L)	0.0024	*
Yearly Average (ug/L)	2.47	*
*lower than (<)		
Sampling Location #2: ROSSER IN		
1st Quarter	0.0018	*
2nd Quarter	0.0021	
3rd Quarter	0.0035	
4th Quarter	0.0018	*
Yearly Average (mg/L)	0.0023	*
Yearly Average (ug/L)	2.30	*
*lower than (<)		

Appendix G: Cartier Water Treatment Facility Annual Lab Results

Results Summary L2730719

Job Reference	CARTIER REGIONAL - PWS 36.00
Report To	GRANT MCGORMAN, Manitoba Water Services Board - CRWC
Date Received	30-Aug-2022 11:04
Report Date	13-Sep-2022 12:14
Report Version	1

Client Sample ID			CARTIER REGIONAL 1 - RAW	CARTIER REGIONAL 2 TREATED	CARTIER REGIONAL 3 - DIST @ ELMBANK BOOST
Date Sampled			30-Aug-2022	30-Aug-2022	30-Aug-2022
Time Sampled			9:30	9:45	7:55
ALS Sample ID			L2730719-1	L2730719-2	L2730719-3
Parameter	Lowest Detection Limit	Units	Water	Water	Water

Physical Tests (Water)

Colour, True	5.0	CU	25.4	<5.0	
Conductivity	1.0	umhos/cm	840	237	
Hardness (as CaCO3)	0.20	mg/L	366	58	
Langelier Index (4 C)		-	1.1	-0.64	
Langelier Index (60 C)		-	1.9	0.14	
pH	0.10	pH units	8.62	8.08	
Total Dissolved Solids	13	mg/L	581	135	
Transmittance, UV (254 nm)	1.0	%T/cm	43.5	91.8	
Turbidity	0.10	NTU	7.75	<0.10	

Anions and Nutrients (Water)

Alkalinity, Total (as CaCO3)	1.0	mg/L	255	66.8	
Ammonia, Total (as N)	0.010	mg/L	0.036	<0.010	
Bicarbonate (HCO3)	1.2	mg/L	280	81.5	
Bromide (Br)	0.010	mg/L	0.066	<0.010	
Carbonate (CO3)	0.60	mg/L	15.7	<0.60	
Chloride (Cl)	0.10	mg/L	18.8	8.38	
Fluoride (F)	0.020	mg/L	0.165	0.421	
Hydroxide (OH)	0.34	mg/L	<0.34	<0.34	
Nitrate (as N)	0.0050	mg/L	0.181	0.113	
Nitrite (as N)	0.0010	mg/L	0.0017	<0.0010	
Sulfate (SO4)	0.30	mg/L	189	34.5	

Organic / Inorganic Carbon (Water)

Dissolved Organic Carbon	0.50	mg/L	11.9	1.55	
Total Organic Carbon	0.50	mg/L	11.8	1.71	

Total Metals (Water)

Aluminum (Al)-Total	0.0030	mg/L	0.202	0.0038	0.0099
Antimony (Sb)-Total	0.00010	mg/L	0.00034	<0.00010	<0.00010
Arsenic (As)-Total	0.00010	mg/L	0.00851	0.00119	0.00117
Barium (Ba)-Total	0.00010	mg/L	0.0676	0.0102	0.0118
Beryllium (Be)-Total	0.00010	mg/L	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	0.000050	mg/L	<0.000050	<0.000050	<0.000050
Boron (B)-Total	0.010	mg/L	0.118	0.110	0.110
Cadmium (Cd)-Total	0.0000050	mg/L	0.0000134	<0.0000050	<0.0000050
Calcium (Ca)-Total	0.050	mg/L	71.2	11.8	12.3
Cesium (Cs)-Total	0.000010	mg/L	0.000031	<0.000010	<0.000010

Chromium (Cr)-Total	0.00010	mg/L	0.00031	<0.00010	<0.00010
Cobalt (Co)-Total	0.00010	mg/L	0.00023	<0.00010	<0.00010
Copper (Cu)-Total	0.00050	mg/L	0.0521	0.0418	0.00779
Iron (Fe)-Total	0.010	mg/L	0.259	<0.010	<0.010
Lead (Pb)-Total	0.000050	mg/L	0.000165	<0.000050	<0.000050
Lithium (Li)-Total	0.0010	mg/L	0.0605	0.0184	0.0196
Magnesium (Mg)-Total	0.0050	mg/L	45.7	6.94	7.36
Manganese (Mn)-Total	0.00010	mg/L	0.0562	0.00355	0.00288
Molybdenum (Mo)-Total	0.000050	mg/L	0.00327	0.000462	0.000480
Nickel (Ni)-Total	0.00050	mg/L	0.00428	0.00064	0.00056
Phosphorus (P)-Total	0.030	mg/L	0.252	0.369	0.356
Potassium (K)-Total	0.050	mg/L	12.1	3.55	3.75
Rubidium (Rb)-Total	0.00020	mg/L	0.00305	0.00070	0.00112
Selenium (Se)-Total	0.000050	mg/L	0.000589	0.000091	0.000097
Silicon (Si)-Total	0.10	mg/L	11.7	3.89	4.74
Silver (Ag)-Total	0.000010	mg/L	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	0.050	mg/L	49.0	27.0	28.4
Strontium (Sr)-Total	0.00020	mg/L	0.321	0.0469	0.0503
Sulfur (S)-Total	0.50	mg/L	72.6	13.0	13.1
Tellurium (Te)-Total	0.00020	mg/L	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	0.000010	mg/L	0.000023	<0.000010	<0.000010
Thorium (Th)-Total	0.00010	mg/L	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total	0.00010	mg/L	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	0.00030	mg/L	0.00668	<0.00030	<0.00030
Tungsten (W)-Total	0.00010	mg/L	<0.00010	<0.00010	<0.00010
Uranium (U)-Total	0.000010	mg/L	0.00312	0.000386	0.000425
Vanadium (V)-Total	0.00050	mg/L	0.00480	0.00079	0.00084
Zinc (Zn)-Total	0.0030	mg/L	<0.0030	0.0050	<0.0030
Zirconium (Zr)-Total	0.00020	mg/L	0.00042	<0.00020	<0.00020

Results Summary L2730257

Job Reference	CARTIER REGIONAL - PWS 36.00
Report To	GRANT MCGORMAN, Manitoba Water Services Board - CRWC
Date Received	25-Aug-2022 11:45
Report Date	31-Aug-2022 7:32
Report Version	1

Client Sample ID	CARTIER REGIONAL 1 - RAW
Date Sampled	25-Aug-2022
Time Sampled	7:15
ALS Sample ID	L2730257-1

Parameter	Lowest Detection Limit	Units	Water
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Organic Parameters (Water)

Microcystin	0.20	ug/L	<0.20
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Appendix H: Headingley Water Treatment Facility Annual Lab Results

Results Summary L2690835

Job Reference	HEADINGLEY REGIONAL - PWS 89.40
Report To	DAVID EPLER, Cartier Regional Water Co-op - Headingley Regional - PWS
Date Received	8-Mar-2022 12:54
Report Date	14-Mar- 2022 15:01
Report Version	1
	Guideline: [Suite] - CA_CDWQ MAC and AO (includes "interim" MACs) - Federal Guidelines for Canadian Drinking Water Quality (MAR. 2021)
	Category:

Client Sample ID	HEADINGLEY REGIONAL 1 - RAW/RIPH	HEADINGLEY REGIONAL 2 - TREATED/ LAB TAP	HEADINGLEY REGIONAL 3 - DISTRIBUTION @ SFX RES INCOMING
Date Sampled	8-Mar-2022	8-Mar-2022	7-Mar-2022
Time Sampled	8:00	7:30	14:20
ALS Sample ID	L2690835-1	L2690835-2	L2690835-3

Parameter	Guideline Limit	Lowest Detection Limit	Units	Water	Water	Water
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Physical Tests (Water)

Colour, True		5.0	CU	11.4	<5.0	
Conductivity		1.0	umhos/cm	977	175	
Hardness (as CaCO3)		0.20	mg/L	464	68.8	
Langelier Index (4 C)			-	0.65	-1.3	
Langelier Index (60 C)			-	1.4	-0.53	
pH		0.10	pH units	7.95	7.24	
Total Dissolved Solids		13	mg/L	653	109	
Transmittance, UV (254 nm)		1.0	%T/cm	67.0	101	
Turbidity		0.10	NTU	57.9	<0.10	

Anions and Nutrients (Water)

Alkalinity, Total (as CaCO3)		1.0	mg/L	292	42.4	
Ammonia, Total (as N)		0.010	mg/L	0.082	0.026	
Bicarbonate (HCO3)		1.2	mg/L	356	51.7	
Bromide (Br)		0.010	mg/L	0.043	<0.010	
Carbonate (CO3)		0.60	mg/L	<0.60	<0.60	
Chloride (Cl)		0.10	mg/L	22.1	2.25	
Fluoride (F)		0.020	mg/L	0.171	<0.020	
Hydroxide (OH)		0.34	mg/L	<0.34	<0.34	
Nitrate (as N)		0.0050	mg/L	0.783	0.223	
Nitrite (as N)		0.0010	mg/L	0.0035	<0.0010	
Sulfate (SO4)		0.30	mg/L	226	38.1	

Organic / Inorganic Carbon (Water)

Dissolved Organic Carbon		0.50	mg/L	9.74	<0.50	
Total Organic Carbon		0.50	mg/L	9.97	<0.50	

Total Metals (Water)

Aluminum (Al)-Total		0.0030	mg/L	0.415	<0.0030	<0.0030
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Antimony (Sb)-Total	0.0001 0	mg/L	0.00018	<0.00010	<0.00010
Arsenic (As)-Total	0.0001 0	mg/L	0.00336	<0.00010	<0.00010
Barium (Ba)-Total	0.0001 0	mg/L	0.105	0.00109	0.00104
Beryllium (Be)-Total	0.0001 0	mg/L	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	0.0000 50	mg/L	<0.000050	<0.000050	<0.000050
Boron (B)-Total	0.010	mg/L	0.119	0.094	0.102
Cadmium (Cd)-Total	0.0000 050	mg/L	0.0000283	<0.0000050	<0.0000050
Calcium (Ca)-Total	0.050	mg/L	99.4	26.8	26.8
Cesium (Cs)-Total	0.0000 10	mg/L	0.000072	<0.000010	<0.000010
Chromium (Cr)-Total	0.0001 0	mg/L	0.00081	<0.00010	<0.00010
Cobalt (Co)-Total	0.0001 0	mg/L	0.00062	<0.00010	<0.00010
Copper (Cu)-Total	0.0005 0	mg/L	0.0980	0.0132	0.00264
Iron (Fe)-Total	0.010	mg/L	0.783	<0.010	<0.010
Lead (Pb)-Total	0.0000 50	mg/L	0.000874	<0.000050	0.000073
Lithium (Li)-Total	0.0010	mg/L	0.0562	0.0035	0.0037
Magnesium (Mg)-Total	0.0050	mg/L	52.4	0.483	0.465
Manganese (Mn)-Total	0.0001 0	mg/L	0.106	0.00475	0.00102
Molybdenum (Mo)-Total	0.0000 50	mg/L	0.00338	<0.000050	<0.000050
Nickel (Ni)-Total	0.0005 0	mg/L	0.00416	<0.00050	<0.00050
Phosphorus (P)-Total	0.030	mg/L	0.168	<0.030	<0.030
Potassium (K)-Total	0.050	mg/L	14.4	0.627	0.638
Rubidium (Rb)-Total	0.0002 0	mg/L	0.00334	<0.00020	<0.00020
Selenium (Se)-Total	0.0000 50	mg/L	0.000362	<0.000050	<0.000050
Silicon (Si)-Total	0.10	mg/L	9.81	0.37	0.39
Silver (Ag)-Total	0.0000 10	mg/L	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	0.050	mg/L	47.8	7.38	8.12
Strontium (Sr)-Total	0.0002 0	mg/L	0.368	0.0279	0.0281
Sulfur (S)-Total	0.50	mg/L	86.1	13.3	13.4
Tellurium (Te)-Total	0.0002 0	mg/L	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	0.0000 10	mg/L	0.000015	<0.000010	<0.000010
Thorium (Th)-Total	0.0001 0	mg/L	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total	0.0001 0	mg/L	0.00010	<0.00010	0.00033
Titanium (Ti)-Total	0.0003 0	mg/L	0.0109	<0.00030	<0.00030
Tungsten (W)-Total	0.0001 0	mg/L	<0.00010	<0.00010	<0.00010
Uranium (U)-Total	0.0000 10	mg/L	0.00389	0.000020	0.000020
Vanadium (V)-Total	0.0005 0	mg/L	0.00240	<0.00050	<0.00050
Zinc (Zn)-Total	0.0030	mg/L	0.0543	0.0031	<0.0030
Zirconium (Zr)-Total	0.0002 0	mg/L	0.00055	<0.00020	<0.00020

Results Summary L2730256

Job Reference HEADINGLEY REGIONAL - PWS 89.40
Report To DAVID EPLER, Cartier Regional Water Co-op - Headingley Regional - PWS
Date Received 25-Aug-2022 11:45
Report Date 29-Aug-2022 14:16
Report Version 1

Client Sample ID			HEADINGLEY REGIONAL 1 - RAW
Date Sampled			25-Aug-2022
Time Sampled			7:45
ALS Sample ID			L2730256-1
Parameter	Lowest Detection Limit	Units	Water

Organic Parameters (Water)

Microcystin	0.20	ug/L	<0.20
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Appendix I: Cartier Regional Water Audits 2022

In 2022 the Office of Drinking discontinued providing system Audit reports to facilities.

For all previous year CRWC DWO Audits please follow this link: [Annual ODW Audits](#)

Who can we call with questions or concerns regarding our drinking water?

For general questions during regular business hours, contact the:

Cartier Water Treatment Facility (204-353-4055) or email cartierwtp@crwc.ca

Headingley Water Treatment Facility (204-832-2555) or email headingleywtp@crwc.ca