Markstay Distribution System Large Municipal Residential Drinking Water System Reports Covering April 1, 2022– December 31, 2022

Reg 170/03 Schedule 22 Annual Water Summary Report
Reg 170/03 Section 11 Annual Water Quality Report

Prepared by the City of Greater Sudbury for The Corporation of the Municipality of Markstay-Warren

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Introduction

This document is prepared to satisfy Section 11, Schedule 22 of the Ontario Regulation 170/03 (O.Reg 170/03) under the Safe Drinking Water Act. The City of Greater Sudbury (CGS) is the operating authority and therefore is responsible for creating and reporting the document to the owner, The Corporation of the Municipality of Markstay-Warren. As CGS took over operations April 1rst, the document will cover from this date to December 31rst of 2022.

Section 11 of Schedule 22 of O.Reg 170/03 states that the annual water quality report must contain the following information:

- A description of the drinking water system along with a list of chemicals used by the system.
- A description of any major expenses incurred during the period covered by the report to install, repair, or replace required equipment.
- A summary of all adverse water quality incidents (AWQI) reported to the Ministry along with the list of corrective actions taken in response all AWQIs
- A summary of all test results required under the regulation, under an approval, municipal drinking water licence or order.
- A statement of where the report will be available for inspection.

Schedule 22 of O.Reg 170/03 states that the report must list the requirements of the Act, the regulations, the system's approval, and any order that the system failed to meet at any time during the period covered by the report. The quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows must also be included in the report along with a comparison to the rated capacity and flow rates approved in the systems approvals document. As Markstay is a receiving system supplied by the Wanapetei Water Treatment plant the flows will represent the systems demand and not supplied.

System Description

The Markstay Distribution System, 220013605, is within the Large Municipal Residential category under the O.Reg 170/03 descriptor. The Municipality of Markstay purchases water Sudbury's Wanapitei Water Treatment Plant. The source for the Wanapetei plant is the Wanapetei river. The Stinson Water Metering Station located at the boundary between the region of Sudbury and the Township of Awery is where the delivery of potable water occurs.
The system has a re-chlorination station that uses 12% sodium hypochlorite as the disinfectant. An elevated storage tank which operates a fill cycle via SCADA.
All is monitored 24/7, 365 days from the Wanapetei plant with the use of the CGS SCADA system.

Table 1 Information to be provided under Section 11 (O.Reg.170/03)

Population Served	<500
Does your Drinking Water System serve more then 10 000 people?	No
Location where Summary Report required under O. Reg. 170/03	Markstay Municipal Office, 21 Main Street South, Markstay, ON P0M 2G0
Number of Designated Facilities served:	None
Did you provide a copy of your annual report to all Designated Facilities you serve?	NA
Number of Interested Authorities you report to	None
Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?	NA
List all Drinking-Water Systems (if any), and their DWS Number which receive all their drinking water from your system	NA
Indicate how you notified system users that your annual report is available and free of charge	notice via the web - notice via a Public Library - notice via Government Office
Indicate if you notified system users that your annual report is available and is free of charge using alternate methods	Yes

Expenditures

Hypo tanks at the re-chlorination station received new level floats, one new chemical feed pump was installed. The chlorination system feed piping and valves were replaced, and the ventilation system was repaired. This maintenance had a monetary value of approximately $4 700.

System Failures and Corrective Actions

Operations has been reducing the water towers residency time, have stopped re-chlorinating at the tank as well as reduced the free chlorine residual in the system. This is being done in attempt to optimise the disinfection and future formation of haloacetic acids (HAA) which is a type of disinfection by-product that are formed when chlorine reacts with natural organic matter present in the water. Currently the running average is over the regulatory limit. Operations will continue to monitor and adjust the system to reduce the presence of HAAs.

Table 2 Adverse Water Quality Incidents (AWQI)

AWQI#	Date	Parameter	Result	Corrective Action
159023	22/07/06	HAA	80ug running average	Changed the tank fill cycle to shorten residency time and stopped the re-chlorination at the tank to lower free chlorine residuals
160214	22/10/03	HAA	83ug running average	Lowered the overall system free chlorine residual
161067	22/12/29	HAA	87ug running average	Hold study to be completed for system optimization

Annual Water Quality Data

Haloacetic acid is a disinfection by-product with a provincial maximum allowable limit is 80 ug. The haloacetic acids results have varied from quarter to quarter and the end of year running average resulted in 87 ug. This parameter is showing a downward trend. Trihalomethanes is another disinfection by-product that the potable water has a limit of 100 ug under regulatory requirements. As of the fourth quarter the running average was 94 ug. This parameter is also showing a downward trend. Lead analysis completed within the distribution system showed no trace residuals with a laboratory result below the detection limit of <0.1 ug/L. Alkalinity for the system was 19 mg/L with a pH of 7.7. One hundred and twenty bacterial samples were collected, and analysis showed no abnormal results for E-Coli, total coliform. Twenty five percent of the samples were tested for heterotrophic plate count with no abnormal results. A continuous analyser completes the free chlorine residual within the system. The maximum free chlorine for this term was 3.71 mg/L and the minimum residual was 0.33 mg/L. The disinfection residual was within regulatory requirements. The systems total flows received from the Wanapetei Water Treatment plant during this reporting time frame was 35 070 m^3.

Conclusion

CGS has operated the system from April 1st of 2022 to December 31st of 2022 within all regulatory requirements. CGS operations will continue to monitor disinfection by-products while optimizing the disinfection process to reduce the systems residuals. As demonstrated within this report Markstay has provided its residents with safe drinking water with no risk of ill health effects to the public.