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Town of Arnprior 2024 – Water Filtration Plant Summary Report

January 21, 2025

Please find below a discussion of the operational undertakings of the Town of Arnprior's Water Filtration Plant (WFP) for the 2024 calendar year. This report is provided to meet the Town's requirements to report annually on the operation of the WFP, as per Municipal Drinking Water License (MDWL) 170-101 Ver. 7 and Schedule 22 of O. Reg. 170/03 (Drinking Water Systems) and to provide residents of the Town of Arnprior with information on an important piece of the Town's municipal infrastructure.

1.0 Regulatory Reporting Requirements

Hereafter, for clarity all requirements of Schedule 22 of O. Reg. 170/03 are listed in blue italics below.

22-2. *(1) The owner of a drinking water system shall ensure that, not later than March 31 of each year after 2003, a report is prepared in accordance with subsections (2) and (3) for the preceding calendar year and is given to,*

(a) in the case of a drinking water system owned by a municipality, the members of the municipal council.

This report is to be presented to the Council of the Town of Arnprior during the regular meeting of Council on March XX, 2025 reporting on the Arnprior Drinking Water System for the period covering January to December 2024.

(2) The report must,

(a) list the requirements of the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at any time during the period covered by the report; and

The Town of Arnprior's Drinking Water System Number is 220000932 and is operated under Municipal Drinking Water Licence (MDWL) 170-101, Ver. 7. The Drinking Water Works Permit (DWWP) number is 170-201 Ver. 3 and the current Permit to Take Water (PTTW) P-300-1179150700 Ver. 1.

2.0 Compliance with Terms and Conditions of the MDWL

The Town of Arnprior owns and operates the Water Filtration Plant and complies with the conditions of the DWWP, PTTW, and MDWL.

3.0 WFP Plant changes and Improvements

- Maintenance parts purchased for soda ash dosing pumps.
- Annual chlorine gas safety maintenance completed by contractor including service, components, and equipment.
- Online fluoride analyzer purchased and commissioned.
- Online free chlorine analyzer purchased and commissioned.
- Online total chlorine analyzer purchased and commissioned.
- Annual calibration of analyzers completed by contracted technician.
- Filters 2 and 3 complete refurb with new underdrains and media.
- Pocket colorimeter for chlorine purchased.
- Gas sensor annual calibration by contracted technician.
- Repair of Actiflo overload relays and purchase of timing relays.
- Onsite training, chlorine handling and SCBA

In accordance with Ontario Regulation 107/03, all required sampling and laboratory analysis of the raw and treated water is carried out in the plant laboratory, as well as a certified contracted laboratory, which includes annual, quarterly and weekly sampling requirements.

Flow meters are calibrated annually by an outside contractor for flow measurement of the water taken from the Madawaska River and to the distribution system.

Continuous water quality analyzers with alarm systems are installed for chlorine residual, turbidity of filtered water and fluoride residual.

All operators are certified to the appropriate level, with ongoing training taking place throughout the year.

4.0 Non-Compliance with Terms and Conditions of PTTW and MDWL

(2) The report must,

(b) for each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure.

In regards to non-compliance of PTTW and MDWL, there were no occurrences to report this period.

5.0 Adverse Test Results and Other Operational Problems

- Early in January 2024 operators observed that filter drain down time was increasing and filter backwash flows were not even across the area of the filters. On physical

inspection of the filters, underdrains were found to be blocked in some area and breached in others. Also media was not in uniform layers.

- Two of the three filters have been fully refurbished, complete with new underdrains and media. Filter #2 was completed in April 2024 and filter #3 in November 2024.
- The remaining filter #1 is to be refurbished April 2025.

6.0 Water Production Flow Measurement

The raw water and the backwash flows at the plant are measured by Endress + Hauser electromagnetic flow meters. These flow meters are calibrated annually by an outside contractor.

7.0 Raw Water Production

(3) The report must also include the following information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system:

1. A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.

2. A comparison of the summary referred to in paragraph 1 to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water licence.

The average daily raw water flow was measured at 4,431 m^3. The maximum daily flow recorded was 5,836 m^3 on August 7th, 2024. The maximum daily raw water flow permitted under the Town's current PTTW from the Madawaska River is 10,340 m^3/day.

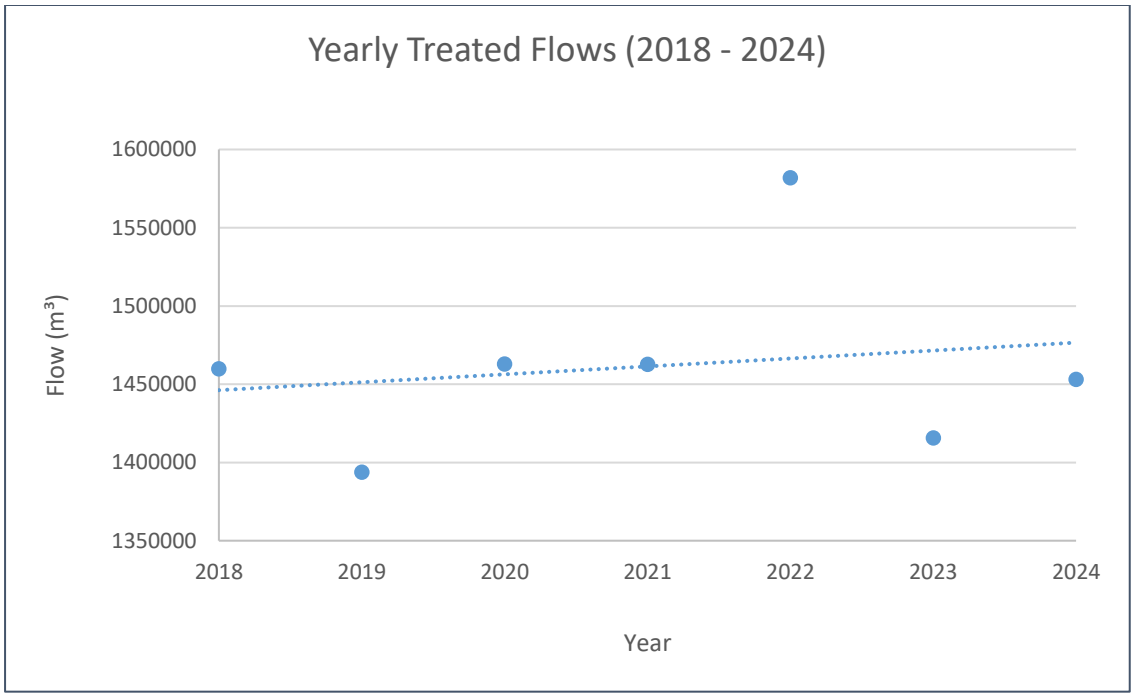
The total annual raw water flow for 2024 was 1,622,110 m^3. This volume has decreased slightly since 2023 which had a total flow of 1,643,630 m^3, a decrease of 1.0 %.

8.0 Treated Water Production

The maximum daily volume of water permitted to be treated by the Town at the WFP under the MDWL in 2024 was 10,340 m^3/day. There were no flow exceedances in 2024 and the average daily treated water flow was measured at 3,978 m^3/day. The maximum daily treated water flow was 5,797 m^3 on December 11th, 2024.

The total annual treated water flow for 2024 was 1,453,021 m^3. This volume has increased slightly as compared to 2023 which had a total flow of 1,415,563 m^3, an increase of 3%.

Please see following chart showing annual treated water flows for the years 2018 to 2024.



9.0 Backwash Water Production

The average daily backwash water flow was 297 m^3 as compared to 471 m^3 in 2023. This decrease can be attributed to longer filter run times and less filter backwashes. The total annual backwash water flow was 108,339 m^3. The backwash water is treated in a residuals treatment system where the solids are removed and pumped to the Water Pollution Control Centre (WPCC) for treatment and the clear supernatant is directed to the Madawaska River. The WFP MDWL stipulates a maximum permitted concentration of Total Suspended Solids (TSS) of 25 mg/L in the supernatant and in 2024 the average was 3.3 mg/L.

10.0 Water Quality

The Town of Arnprior carries out all the sampling and analysis of the raw and treated water as per the requirements of the MDWL and O. Reg. 170/03, schedules 10, 13, 23 and 24. s. Certain parameters are done at different frequencies such as daily weekly, quarterly and annually.

11.0 Zebra Mussels

Zebra mussels are evident at the Low Lift Pumphouse. At this time, they are manageable with semi-annual cleaning of the intake screens.

12.0 Turbidity

The Madawaska River is an excellent source of raw water with stable water turbidity. The performance criterion for filtered water is a turbidity of less than or equal to 0.30 Nephelometric Turbidity Units (NTU) in 95% of the measurements each month without exceeding 1.0 NTU. The filtered water maximum turbidity was 0.19 NTU on April 24, 2024.

13.0 Quarterly and Annual Water Sampling

Sampling and testing were carried out at various frequencies for Volatile Organic Compounds, Inorganic compounds, Pesticides and PCB as per Schedule 23 and 24 of O. Reg. 170/03. These samples are taken by operators and sent to a certified laboratory. The analytical revealed that all samples were within acceptable concentrations under the Ontario Drinking Water Standards.

14.0 Hardness

The recommended operational guideline for hardness is 80 mg/L expressed as Calcium Carbonate. This provides an acceptable balance between corrosion control and incrustation. Hardness is caused by the presence of certain dissolved chemical compounds with calcium and magnesium being the primary elements. The amount of hardness varies significantly depending on the source. The Arnprior raw water source has an average hardness of 44 mg/L, which would be considered soft water.

15.0 Alkalinity

Alkalinity is a measure of the capacity of water to neutralize acids and is known as the buffering capacity. The recommended operational range for alkalinity in treated drinking water is 30 mg/l to 500 mg/l as Calcium Carbonate. The Arnprior raw water has an average alkalinity of 42 mg/L and the treated water an average of 44 mg/L.

16.0 Fluoride

Hydrofluorosilicic acid is added to the treated water to attain an average fluoride residual in 2024 of 0.67 mg/L with a Maximum Acceptable Concentration of 1.5 mg/L. The fluoride residual is monitored with an online analyzer and in laboratory analysis.

17.0 Water Treatment Chemicals

The WFP uses Chlorine gas, polymer, Ammonium Sulphate (Chloramination), Polyaluminum Chloride (Coagulant), Sodium Carbonate (Soda Ash), Phosphoric Acid (Corrosion Control), and Hydrofluorosilicic Acid (Fluoride).

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