Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Elk Lake Drinking Water System

2022 Annual/Summary Report

Prepared by the Ontario Clean Water Agency
on behalf of the Township of James

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INTRODUCTION

Municipalities throughout Ontario have been required to comply with Ontario Regulation 170/03 made under the *Safe Drinking Water Act* (SDWA) since June 2003. The Act was enacted following recommendations made by Commissioner O'Conner after the Walkerton Inquiry. The Act's purpose is to protect human health through the control and regulation of drinking water systems. O. Reg. 170/03 regulates drinking water testing, use of licensed laboratories, treatment requirements and reporting requirements.

Section 11 of Regulation 170/03 requires the owner to produce an Annual Report. This report must include the following:

1. Description of system & chemical(s) used
2. Summary of any adverse water quality reports and corrective actions
3. Summary of all required testing
4. Description of any major expenses incurred to install, repair or replace equipment

This annual report must be completed by February 28th of each year.

Schedule 22 of the regulation also requires a Summary Report which must be presented & accepted by Council by March 31st of each year for the preceding calendar year.

The report must list the requirements of the Act, its regulations, the system's Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL), Certificate of Approval (if applicable), and any regulatory requirements the system failed to meet during the reporting period. The report must also specify the duration of the failure, and for each failure referred to, describe the measures that were taken to correct the failure.

The *Safe Drinking Water Act* (2002) and the drinking water regulations can be viewed at the following website: http://www.e-laws.gov.on.ca.

To enable the Owner to assess the rated capacity of their system to meet existing and future planned water uses, the following information is also required in the report.

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

2. A comparison of the summary to the rated capacity and flow rates approved in the systems approval, drinking water works permit or municipal drinking water licence or a written agreement if the system is receiving all its water from another system under an agreement.

The reports have been prepared by the Ontario Clean Water Agency (OCWA) on behalf of the Owner and presented to council as the 2022 Annual/Summary Report.

Elk Lake Drinking Water System

Section 11

2022 Annual Report

Section 11 - ANNUAL REPORT

1.0 INTRODUCTION

Drinking-Water System Name:	**Elk Lake Drinking Water System**
Drinking-Water System No.:	220007329
Drinking-Water System Owner:	The Corporation of the Township of James
Drinking-Water System Category:	Large Municipal, Residential System
Period being reported:	January 1, 2022 to December 31, 2022

Does your Drinking Water System serve more than 10,000 people? No

Is your annual report available to the public at no charge on a web site on the Internet? Yes at http://www.elklake.ca/

Location where the report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

Elk Lake Municipal Office
33 Third Street
Elk Lake, Ontario P0J 1G0

Drinking Water Systems that receive drinking water from the Elk Lake Drinking Water System

The Elk Lake Drinking Water System provides all drinking water to the community of Elk Lake.

The Annual Report was not provided to any other Drinking Water System Owners.

The Ontario Clean Water Agency prepared the 2022 Annual/Summary Report for the Elk Lake Drinking Water System and provided a copy to the system owner; the Township of James. The Elk Lake Drinking Water System is a stand-alone system that does not receive water from or send water to another system.

Notification to system users that the Annual Report is available for viewing is accomplished through:

- Notice via the local newspaper and Facebook

2.0 ELK LAKE DRINKING WATER SYSTEM (DWS No. 220007329)

The Elk Lake Drinking Water System is owned by the Corporation of the Township of James and consists of a Class 1 water treatment subsystem and a Class 1 water distribution subsystem. The system is a communal ground water well supply that services the Town of Elk Lake. The Ontario Clean Water Agency is the accredited operating authority and is designated as the Overall Responsible Operator for both the water treatment and water distribution facilities.

Raw Water Supply

The water treatment facility is located on Lot 83 First Street in the Township of James and is supplied by one 65 m deep, double steel casing production well. The well is located in water treatment plant and is equipped with a vertical turbine pump, rated at 63 L/s with a 250 mm diameter magnetic flow meter installed on the discharge line. The well includes pump-to-waste capabilities from the pump discharge line.

A second well located in the vicinity of the east end of the bridge across the Montreal River on Lot 5, Concession 5 in the Township of James acts as a monitoring/observation well. It is drilled to a depth of 79 meters and consists of a steel casing. This well is not equipped with a well pump and is not connected to the water treatment plant.

Water Treatment

The production well feeds the water treatment plant that has a maximum rated capacity of 2790 cubic meters per day (m^3/d).

The raw water is directed to an iron and manganese removal system (Filtronics brand) consisting of two reaction vessels fed with sodium hypochlorite, three pressure filters each having a rated capacity of 646 L/min, three flow meters dedicated to each filter and continuous monitoring of chlorine residual and filter operation. The filter backwash recycling system is equipped with a 40 m^3 underground holding tank, a submersible pump rated at 3.8 L/s with a discharge line that re-circulates the supernatant with raw water at the well pump header and a sludge pump for residual disposal to a tanker truck.

The disinfection system consists of a 450 L sodium hypochlorite solution tank equipped with spill containment and duplicate pace-to-flow chemical feed injection pumps (one duty and one standby). Chemical injection is accomplished at the raw water pipe header, prior to entering the reaction vessels.

Water Storage and Pumping Capabilities

The treated water discharges into twin cell storage clearwells, connected in series and having a total volume of 540 m^3. Curtain baffling was installed in Cell #2 of the clearwell to provide sufficient chlorine contact time.

Three vertical turbine pumps (one duty, one standby draw from clearwell #1, and one fire pump installed over clearwell #2) with variable frequency drives each rated at 37.5 L/s. A magnetic finished flow meter, chlorine residual analyzer, and a surge anticipator are installed on the discharge main prior to exiting the pump house and entering the distribution system. The water treatment process is controlled by a dedicated Program Logic Controller (PLC) and monitored through the SCADA computer system.

Control System

Control System Supervisory Control and Data Acquisition (SCADA) is the method of control implemented for the Elk Lake Water Treatment System. All analyzing, monitoring and control module equipment information is routed through the SCADA system for operator monitoring and control. Control of equipment can be accomplished locally using the SCADA computer located at the Elk Lake water treatment plant or remotely using operator computers and cell phones. Alarm capability and set point adjustment along with trend monitoring are also available through SCADA system controls.

Emergency Power

A 160 kW emergency stand-by power generator is available at the plant and is capable of supplying power to the entire facility during power failures.

Distribution System

The Elk Lake Drinking Water System is classified as a Large Municipal Residential Drinking Water System and provides water to a population of approximately 460 residents through an estimated 220 service connections. The distribution system was constructed in 1992 and consists of mainly of PVC constructed pipe. Approximately 60 fire hydrants are connected to the system to aid in fire protection. There are no off-site water storage facilities in the distribution system, as storage is incorporated within the treatment plant.

3.0 LIST OF WATER CHEMICALS USED OVER THE REPORTING PERIOD

The following chemicals were used in the treatment process at the Elk Lake Water Treatment Plant.

- Sodium hypochlorite – Oxidation and Disinfection

This treatment chemical meets AWWA and NSF/ANSI standards.

4.0 SIGNIFICANT EXPENSES INCURRED IN THE DRINKING WATER SYSTEM

OCWA is committed to maintaining the assets of the drinking water system and sustains a program of scheduled inspection and maintenance activities using a computerized Work Management System (WMS).

Significant expenses incurred in the drinking water system include:

- SAI Global Quality and Environmental Management System (QEM) surveillance and re-accreditation audits. Accreditation achieved on October 18, 2022.
- Permit to Take Water renewal application submitted December 29, 2022
- Cleaning and inspections of both Clearwell No. 1 and No. 2
- Purchased new SCADA computer
- Purchase new portable pH meter
- Purchase two sodium hypochlorite pumps
- New battery for generator

5.0 DETAILS ON NOTICES OF ADVERSE TEST RESULTS AND OTHER PROBLEMS REPORTED TO & SUBMITTED TO THE SPILLS ACTION CENTER

Based on information kept on record by OCWA, the Elk Lake Drinking Water System was in full compliance in 2022 with no adverse water quality incidents reported to the Ministry's Spills Action Centre.

6.0 MICROBIOLOGICAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Microbiological Data

Sample Type	# of Samples	Range of *E. coli* Results *(min to max)*	Range of Total Coliform Results *(min to max)*	# of HPC Samples	Range of HPC Results *(min to max)*
Raw (Production Well)	52	0 to 2	0 to 2	0	N/A
Treated	52	0 to 0	0 to 0	52	< 10 to 30
Distribution	104	0 to 0	0 to 0	52	< 10 to 60

Maximum Allowable Concentration (MAC) for *E. coli* = 0 Counts/100 mL
MAC for Total Coliforms = 0 Counts/100 mL
"<" denotes less than the laboratory's method detection limit
">" denotes greater than the laboratory's method detection limit.

Notes:

1. One microbiological sample is collected and tested each week from the raw and treated water supply. A total of two microbiological samples are collected and tested each week from the Elk Lake distribution system. At least 25% of the distribution samples must be tested for HPC bacteria.

Refer to *Appendix A* for a monthly summary of microbiological test results.

7.0 OPERATIONAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Raw Water Turbidity Data

Parameter	# of Samples	Range of Results *(min to max)*	Unit of Measure
Turbidity (Well)	24	0.36 to 2.38	NTU

Note: Turbidity samples are required once every month.

Continuous Monitoring in the Treatment Process

Parameter	# of Samples	Range of Results *(min to max)*	Unit of Measure	Standard
Free Chlorine Residual	8760	0.38 to 2.04	mg/L	CT

Notes:

1. For continuous monitors 8760 is used as the number of samples for one year.

2. CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed for the Elk Lake water plant if the free chlorine residual level drops below 0.330 mg/L to ensure primary disinfection is achieved.

Summary of Chlorine Residual Data in the Distribution System

Parameter	No. of Samples	Range of Results *(min to max)*	Unit of Measure	Standard
Free Chlorine Residual	364	0.54 to 1.75	mg/L	≥ 0.05

Note: A total of seven operational checks for chlorine residual in the distribution system are collected each week. Four (4) samples are tested one day and three (3) on a second day. The sample sets are collected at least 48-hours apart and samples collected on the same day are from different locations.

Refer to *Appendix B* for a monthly summary of the above operational data.

Summary of Nitrate & Nitrite Data *(sampled at the water treatment plant every quarter)*

Date of Sample	Nitrate Result	Nitrite Result	Unit of Measure	Exceedance
January 11	< 0.1	< 0.01	mg/L	No
April 11	< 0.1	< 0.01	mg/L	No
July 11	< 0.1	< 0.01	mg/L	No
October 11	< 0.1	< 0.01	mg/L	No

Maximum Allowable Concentration (MAC) for Nitrate = 10 mg/L
MAC for Nitrite = 1 mg/L

Summary of Total Trihalomethane Data *(sampled in the distribution system every quarter)*

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 11	18.5	ug/L	20.1	No
April 11	22.5	ug/L		
July 11	23.4	ug/L		

Summary of Total Trihalomethane Data *(sampled in the distribution system every quarter)*

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
October 11	15.9	ug/L		

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/L (Four Quarter Running Average)

Summary of Total Haloacetic Acid Data *(sampled in the distribution system every quarter)*

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 11	21	ug/L	20.5	No
April 11	14	ug/L		
July 11	25	ug/L		
October 11	22	ug/L		

Maximum Allowable Concentration (MAC) for Total Haloacetic Acids = 80 ug/L (Four Quarter Running Average)

Summary of Most Recent Lead Data under Schedule 15.1

(applicable to the following drinking water systems; large municipal residential systems, small, municipal residential systems, and non-municipal year-round residential systems)

The Elk Lake Drinking Water System was eligible to follow the "Exemption from Plumbing Sampling" as described in section 15.1-5(9) and 15.1-5(10) of Schedule 15.1 of Ontario Regulation 170/03. The exemption applies to a drinking water system if, in two consecutive periods at reduced sampling, not more than 10% of all samples from plumbing exceed the maximum allowable concentration (MAC) of 10 ug/L for lead. As such, the system was required to test for total alkalinity and pH in one distribution sample collected during the periods of December 15 to April 15 (winter period) and June 15 to October 15 (summer period). This testing is required in every 12-month period with lead testing in every third 12-month period.

Lead samples were last collected in 2020 and results fell well below the MAC. Two rounds of alkalinity and pH testing were carried out on March 7th and September 12th of 2022. Results are summarized in the table below.

Summary of Lead Data *(sampled in the distribution system)*

Date of Sample	# of Samples	Field pH	Field Temperature (°C)	Alkalinity (mg/L)	Lead (ug/L)
March 7	1	7.43	6.0	259	N/A
September 12	1	7.92	16.8	244	N/A

Note: Next lead sampling scheduled for 2023

Most Recent Schedule 23 Inorganic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Antimony	< 0.5	ug/L	6	No	No
Arsenic	1.0	ug/L	10	No	No
Barium	420.0	ug/L	1000	No	No
Boron	15.0	ug/L	5000	No	No
Cadmium	< 0.1	ug/L	5	No	No
Chromium	< 1.0	ug/L	50	No	No
Mercury	< 0.1	ug/L	1	No	No
Selenium	< 0.2	ug/L	50	No	No
Uranium	< 1.0	ug/L	20	No	No

Note: Sample required every 36 months (sample date = *October 6, 2020).* Next sampling scheduled for October 2023

Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Alachlor	< 0.36	ug/L	5	No	No
Atrazine + N-dealkylated metobolites	< 0.5	ug/L	5	No	No
Azinphos-methyl	< 0.27	ug/L	20	No	No
Benzene	< 0.1	ug/L	1	No	No
Benzo(a)pyrene	< 0.01	ug/L	0.01	No	No
Bromoxynil	< 0.109	ug/L	5	No	No
Carbaryl	< 1.0	ug/L	90	No	No
Carbofuran	< 2.0	ug/L	90	No	No
Carbon Tetrachloride	< 0.2	ug/L	2	No	No
Chlorpyrifos	< 0.27	ug/L	90	No	No
Diazinon	< 0.27	ug/L	20	No	No
Dicamba	< 0.342	ug/L	120	No	No
1,2-Dichlorobenzene	< 0.3	ug/L	200	No	No
1,4-Dichlorobenzene	< 0.3	ug/L	5	No	No
1,2-Dichloroethane	< 0.3	ug/L	5	No	No
1,1-Dichloroethylene (vinylidene chloride)	< 0.3	ug/L	14	No	No
Dichloromethane	< 1.0	ug/L	50	No	No
2-4 Dichlorophenol	< 0.2	ug/L	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	< 0.41	ug/L	100	No	No
Diclofop-methyl	< 0.137	ug/L	9	No	No
Dimethoate	< 0.27	ug/L	20	No	No
Diquat	< 0.2	ug/L	70	No	No
Diuron	< 7.0	ug/L	150	No	No
Glyphosate	< 20.0	ug/L	280	No	No
Malathion	< 0.27	ug/L	190	No	No

Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Metolachlor	< 0.18	ug/L	50	No	No
Metribuzin	< 0.18	ug/L	80	No	No
Monochlorobenzene	< 0.5	ug/L	80	No	No
Paraquat	< 0.2	ug/L	10	No	No
Polychlorinated Biphenyls (PCBs)	< 0.06	ug/L	3.0	No	No
Pentachlorophenol	< 0.3	ug/L	60	No	No
Phorate	< 0.18	ug/L	2	No	No
Picloram	< 0.096	ug/L	190	No	No
Prometryne	< 0.09	ug/L	1	No	No
Simazine	< 0.27	ug/L	10	No	No
Terbufos	< 0.18	ug/L	1	No	No
Tetrachloroethylene	< 0.3	ug/L	10	No	No
2,3,4,6-Tetrachlorophenol	< 0.2	ug/L	100	No	No
Triallate	< 0.18	ug/L	230	No	No
Trichloroethylene	< 0.2	ug/L	5	No	No
2,4,6-Trichlorophenol	< 0.2	ug/L	5	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA)	< 6.83	ug/L	100	No	No
Trifluralin	< 0.18	ug/L	45	No	No
Vinyl Chloride	< 0.1	ug/L	1	No	No

Note: Sample required every 36 months (sample date = *October 6, 2020).* Next sampling scheduled for October 2023

Inorganic or Organic Test Results that Exceeded Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

No inorganic or organic parameter(s) listed in Schedule 23 and 24 of Ontario Regulation 170/03 exceeded half the standard found in Schedule 2 of the Ontario Drinking Water Standard (O. Reg. 169/03) during the reporting period.

Most Recent Sodium Data Sampled at the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 6, 2020	1	7.18	mg/L	20	No

Note: Sample required every 60 months. Next sampling scheduled for October 2025

Most Recent Fluoride Data Sampled at the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 6, 2020	1	0.09	mg/L	1.5	No

Note: Sample required every 60 months. Next sampling scheduled for October 2025

Additional Testing Performed in Accordance with an Approval, Order or Legal Instrument

No additional regulatory sampling and testing was required for the Elk Lake Drinking Water System during the 2022 reporting period.

Elk Lake Drinking Water System

Schedule 22

2022 SUMMARY REPORT

FOR MUNICIPALITIES

Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES

1.0 INTRODUCTION

Drinking-Water System Name:	**Elk Lake Drinking Water System**
Municipal Drinking Water Licence (MDWL) No.:	274-101-4 (issued February 16, 2021)
Drinking Water Work Permit (DWWP) No.:	274-201-3 (issued February 16, 2021)
Permit to Take Water (PTTW) No.:	6352-972Q3Y (issued April 24, 2013)
Period being reported:	January 1, 2022 to December 31, 2022

2.0 REQUIREMENTS THE SYSTEM FAILED TO MEET

According to information kept on record by OCWA, the Elk Lake Drinking Water System failed to meet the following requirements during the 2022 reporting period:

Drinking Water Legislation	Requirement(s) the System Failed to Meet	Duration	Corrective Action(s)	Status
Section 20(1) of Reg. 903, and Section 1-2(1)1 of Schedule 1 of O. Reg. 170/03	The owner was not maintaining the production well(s) in a manner sufficient to prevent entry into the well of surface water and other foreign materials. Well No. 2 (monitoring well) located on the east end of the bridge across the Montreal River is not well maintained. The locked wooden enclosure can be completely lifted off the well, and the top cap of the well casing can be removed easily. Even though Well No. 2 is not the primary source for drinking water, any tampering or infiltration from an outside source well can pose a threat to the aquifer of Well No. 1.	Discovered: August 10, 2022	September 9 - the well cap was secured in place and locked. The wooden box will remain in place. It has reflective markings for visibility; preventing damage from snow plows.	Complete
Section 6-5(1) 10 (i) of Schedule 6 of O. Reg. 170/03	All continuous analysers were not calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation. The operating authority indicated that the operators will verify the analyzer to within a +/- 5% accuracy. The following dates are where calibration checks were done improperly:	Discovered: August 10th, 2022 Dates: December 9th, 2021 & December 14th, 2021	September 9th - a training session was held with all operators to ensure proper checks and verification of the on-line analyzer is being done. A review of the procedure and a hands-on demonstration was done as part of the training. Training records were submitted to MECP Water Inspector Rachel Hamelin on	Complete

Drinking Water Legislation	Requirement(s) the System Failed to Meet	Duration	Corrective Action(s)	Status
	-December 9, 2021, the operator took a handheld residual of 0.78 mg/L and calibrated the online analyzer at the WTP as 0.80 mg/L. -December 14, 2021, the operator took a handheld residual of 0.50 mg/L and calibrated the online analyzer at the WTP as 0.53 mg/L.		September 9, 2022.	

3.0 SUMMARY OF FLOWS AND COMPARISON TO REGULATORY LIMITS

Flow Monitoring

MDWL No. 274-101 requires the owner to install a sufficient number of flow measuring devices to permit the continuous measurement and recording of:

- the flow rate and daily volume of treated water that flows from the treatment subsystem the distribution system, and
- the flow rate and daily volume of water that flows into the treatment subsystem.

The flow monitoring equipment identified in the MDWL is present and operating as required. These flow meters are calibrated on an annual basis as specified in the manufacturers' instructions.

Water Usage

The following water usage tables summarize the quantities and flow rates of water taken and produced during the 2022 reporting period, including total monthly volumes, average monthly volumes, maximum monthly volumes, and maximum flow rates.

Raw Water

2022 - Monthly Summary of Water Takings from the Source (Well No. 1)

Regulated by by Permit to Take Water (PTTW) #6352-972Q37 issued April 24, 2013

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m^3)	3552	3264	3533	3246	3640	4209	4190	4480	3518	3885	3334	3253	44104
Average Volume (m^3/d)	114.6	116.6	114.0	108.2	117.4	140.3	135.2	144.5	117.3	125.3	111.1	104.9	121
Maximum Volume (m^3/d)	204	156	264	163	155	353	371	333	190	281	155	201	371
PTTW - Maximum Allowable Volume (m^3/day)	2162	2162	2162	2162	2162	2162	2162	2162	2162	2162	2162	2162	2162
Maximum Flow Rate (L/min)	3360	3420	3480	3360	3540	3360	3540	3360	3420	3600	3540	3540	3600
PTTW - Maximum Allowable Flow Rate (L/min)	3840	3840	3840	3840	3840	3840	3840	3840	3840	3840	3840	3840	3840

The system's Permit to Take Water #6352-972Q3Y, allows the Township to withdraw water at the following rates:

Well No. 1 (Production Well):	2,162 m^3/day	3,840 L/minute
Well No. 2 (Observation Well):	217 m^3/day	227 L/minute
Total Combined Daily Volume:	2,489 m^3/day	

A review of the raw water flow data indicates that the system did not exceed the maximum allowable volume or maximum flow rate during the reporting period.

Well No. 2 is a stand-alone observation well that is not equipped with a well pump. No water was taken from this well in 2022.

Treated Water

2022 - Monthly Summary of Treated Water Supplied to the Distribution System

Regulated Municipal Drinking Water Licence (MDWL) #274-101 (issue 4), issued February 16, 2021

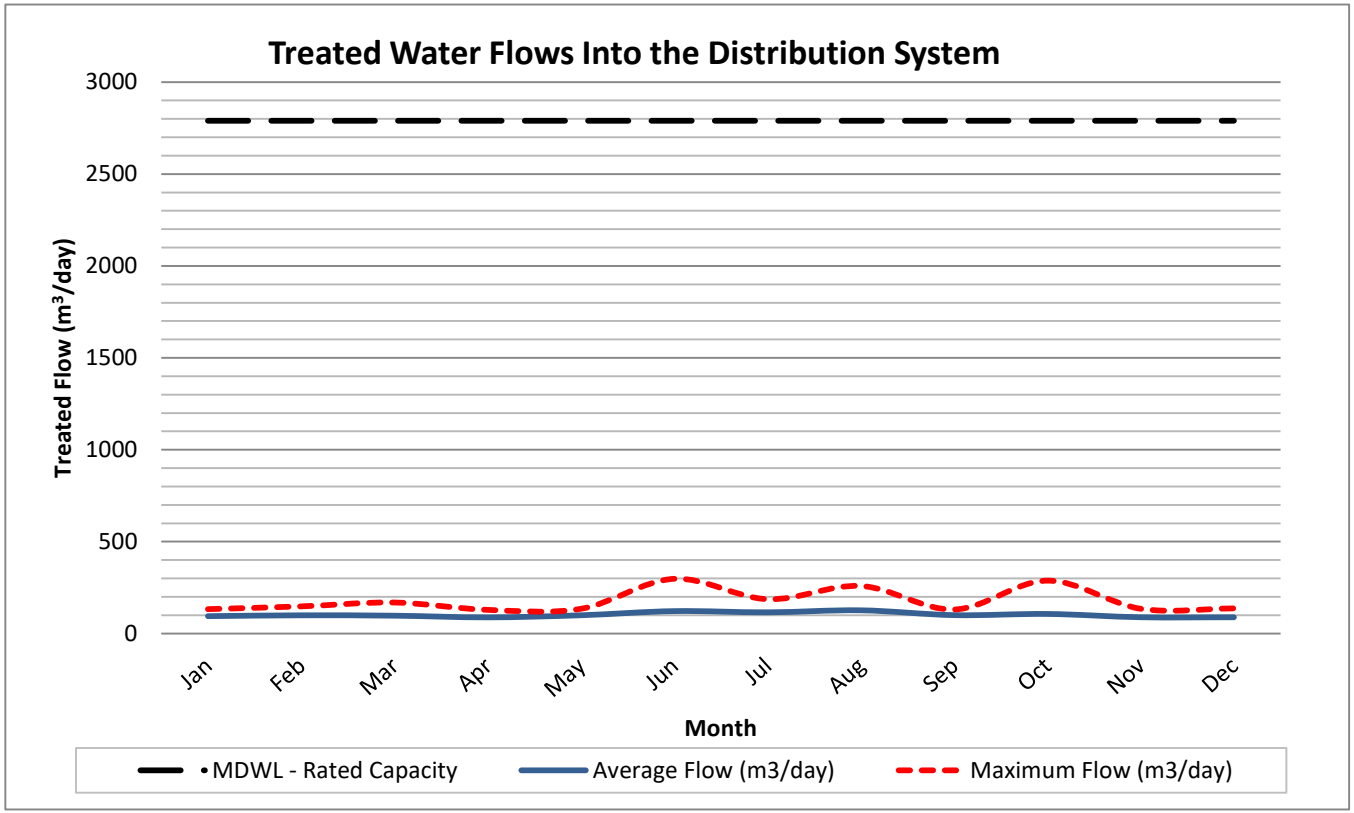
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m^3)	2938	2784	3017	2646	3090	3666	3587	3925	3009	3309	2665	2750	37386
Average Volume (m^3/d)	95	99	97	88	100	122	116	127	100	107	89	89	102
Maximum Volume (m^3/d)	133	148	169	129	135	298	187	259	131	288	135	137	298
MDWL/C of A - Rated Capacity (m^3/day)	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790

Schedule C, Section 1.0 (1.1) of MDWL No. 274-101 states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 2790 m^3/day. The Elk Lake DWS complied with this limit having a recorded maximum volume of 298 m^3/day on June 7th. This represents 10.7% of the rated capacity.

Figure 1 compares the average and maximum flow rates into the distribution system to the rated capacity of the system identified in the MDWL.

Figure 1: 2022 - Comparison of Treated Water Flows to the Rated Capacity

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Flow (m^3/day)	95	99	97	88	100	122	116	127	100	107	89	89
Maximum Flow (m^3/day)	133	148	169	129	135	298	187	259	131	288	135	137
MDWL - Rated Capacity	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790
% Rated Capacity	5	5	6	5	5	11	7	9	5	10	5	5



Summary of System Performance

The following information is provided to enable the Owner to assess the capability of the system to meet existing and future water usage needs.

Rated Capacity of the Plant (MDWL)	2,790 m^3/day	
Average Daily Flow for 2022	102 m^3/day	3.7 % of the rated capacity
Maximum Daily Flow for 2022	298 m^3/day	10.7 % of the rated capacity
Total Treated Water Produced in 2022	37,386 m^3	

Historical Flows

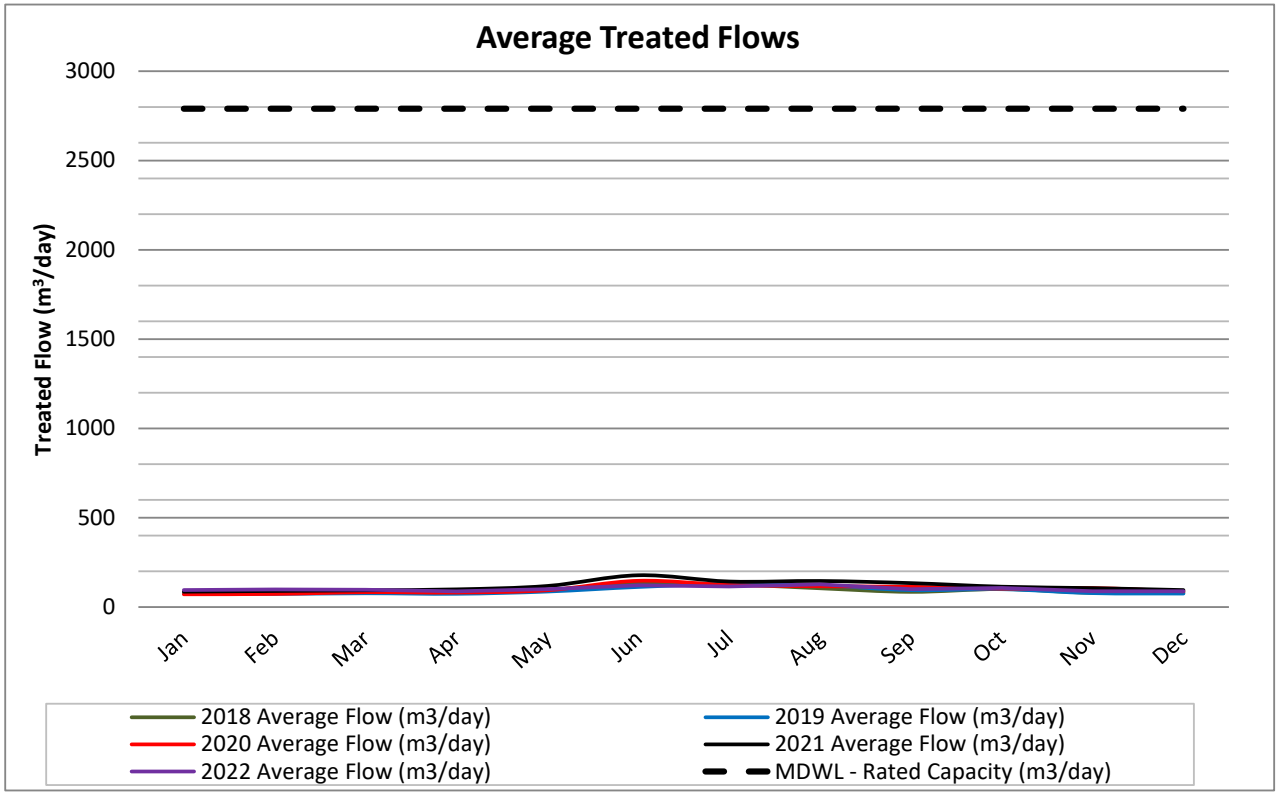
Elk Lake Water Treatment Plant – Historical Flow Comparison

Year	Maximum Treated Flow (m^3/d)	Average Daily Treated Flow (m^3/d)	Average Day % of Rated Capacity (2790 m^3/d)
2022	**298**	**102**	**3.7%**
2021	656	117	4.2%
2020	660	100	3.6%
2019	455	91	3.3%
2018	642	96	3.4%

Figure 2 compares the average treated water flows from 2018 to 2022.

Figure 2: Elk Lake Water Treatment System - Average Treated Water Flows from 2018 to 2022

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018 Average Flow (m^3/day)	76	93	84	88	96	131	127	105	85	101	80	81
2019 Average Flow (m^3/day)	74	73	77	74	87	113	129	122	95	100	78	76
2020 Average Flow (m^3/day)	71	73	83	81	94	147	123	116	113	103	106	88
2021 Average Flow (m^3/day)	86	90	94	99	118	178	143	146	134	114	106	95
2022 Average Flow (m^3/day)	95	99	97	88	100	122	116	127	100	107	89	89
MDWL - Rated Capacity (m^3/day)	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790



CONCLUSION

The water quality data collected in 2022 demonstrates that the Elk Lake drinking water system provided high quality drinking water to its users which met all the Ontario Drinking Water Standards having no incidents of non-compliance or adverse water quality incidents during the reporting period.

The system was able to operate in accordance with the terms and conditions of the Permit to Take Water and for most of the reporting period and in accordance with the rated capacity of the licence while meeting the community's demand for water use.

APPENDIX A

Monthly Summary of Microbiological Test Results

ELK LAKE DRINKING WATER SYSTEM
2022 SUMMARY OF MICROBIOLOGICAL TEST RESULTS

Facility Works Number: 220007329
Facility Owner: Municipality: Township of James
Facility Classification: Class 1 Water Treatment

RAW WATER	01/2022	02/2022	03/2022	04/2022	05/2022	06/2022	07/2022	08/2022	09/2022	10/2022	11/2022	12/2022	Total	Avg	Max	Min
Well 1 (Production) / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	4	5	4	4	5	4	5	4	4	52			
Max Lab	0	0	0	0	0	0	< 2	0	0	0	0	0			2	
Mean Lab	0	0	0	0	0	0	< 0.5	0	0	0	0	0		< 0.038		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Well 1 (Production) / E. Coli: EC - cfu/100mL																
Count Lab	5	4	4	4	5	4	4	5	4	5	4	4	52			
Max Lab	0	0	0	0	0	0	< 2	0	0	0	0	0			< 2	
Mean Lab	0	0	0	0	0	0	< 0.5	0	0	0	0	0		< 0.038		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0

TREATED WATER	01/2022	02/2022	03/2022	04/2022	05/2022	06/2022	07/2022	08/2022	09/2022	10/2022	11/2022	12/2022	Total	Avg	Max	Min
Treated Water (POE) / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	4	5	4	4	5	4	5	4	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water (POE) / E. Coli: EC - cfu/100mL																
Count Lab	5	4	4	4	5	4	4	5	4	5	4	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water (POE) / HPC - cfu/mL																
Count Lab	5	4	4	4	5	4	4	5	4	5	4	4	52			
Max Lab	< 10	< 10	< 10	< 10	< 10	< 20	< 20	< 10	30	< 10	< 10	< 10			30	
Mean Lab	< 10	< 10	< 10	< 10	< 10	< 12.5	< 12.5	< 10	< 17.5	< 10	< 10	< 10		< 10.962		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10

DISTRIBUTION WATER	01/2022	02/2022	03/2022	04/2022	05/2022	06/2022	07/2022	08/2022	09/2022	10/2022	11/2022	12/2022	Total	Avg	Max	Min
EL-3 (Bacti) / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	4	5	4	4	5	4	5	4	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
EL-3 (Bacti) / E. Coli - cfu/100mL																
Count Lab	5	4	4	4	5	4	4	5	4	5	4	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
EL-3 (Bacti) / HPC - cfu/mL																
Count Lab	2	2	2	2	2	2	2	2	2	3	1	2	24			
Max Lab	< 10	< 10	< 20	< 10	< 20	< 10	< 20	< 10	< 10	< 10	20	< 10			20	
Mean Lab	< 10	< 10	< 15	< 10	< 15	< 10	< 15	< 10	< 10	< 10	20	< 10		< 11.667		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	20	< 10				< 10
EL-4 (Bacti) / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	4	5	4	4	5	4	5	4	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
EL-4 (Bacti) / E. Coli - cfu/100mL																
Count Lab	5	4	4	4	5	4	4	5	4	5	4	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
EL-4 (Bacti) / HPC - cfu/mL																
Count Lab	3	2	2	2	3	2	2	3	2	2	3	2	28			
Max Lab	< 10	< 20	< 10	< 10	< 20	< 10	< 60	< 60	< 10	10	20	< 10			60	
Mean Lab	< 10	< 15	< 10	< 10	< 13.333	< 10	< 35	< 33.333	< 10	10	16.667	< 10		< 15.714		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	10	10	< 10				< 10

APPENDIX B

Monthly Summary of Operational Data

ELK LAKE DRINKING WATER SYSTEM
2022 SUMMARY OF OPERATIONAL TEST RESULTS

Facility Works Number: **220007329**
Facility Owner: **Municipality: Township of James**
Facility Classification: **Class 1 Water Treatment**

RAW WATER	01/2022	02/2022	03/2022	04/2022	05/2022	06/2022	07/2022	08/2022	09/2022	10/2022	11/2022	12/2022	Total	Avg	Max	Min
Well 1 (Production) / Turbidity - NTU																
Count IH	2	2	2	2	2	2	2	2	2	2	2	2	24			
Max IH	1.22	0.83	0.49	0.39	0.55	0.46	0.86	1.96	2.38	1.18	0.98	0.55			2.38	
Mean IH	1.21	0.62	0.435	0.375	0.525	0.455	0.845	1.79	2.285	1.125	0.805	0.52		0.916		
Min IH	1.2	0.41	0.38	0.36	0.5	0.45	0.83	1.62	2.19	1.07	0.63	0.49				0.36

TREATED WATER	01/2022	02/2022	03/2022	04/2022	05/2022	06/2022	07/2022	08/2022	09/2022	10/2022	11/2022	12/2022	Total	Avg	Max	Min
Treated Water (POE) / Cl Residual: Free (0.33 mg/L) - mg/L																
Max OL	1.08	1.18	1.16	1.12	0.95	0.93	1.63	2.04	1.81	1.34	1.28	1.38			2.04	
Mean OL	0.942	1.039	1.024	0.938	0.818	0.819	0.902	1.481	1.333	0.964	0.975	1.112		1.029		
Min OL	0.81	0.91	0.89	0.42	0.73	0.44	0.38	0.93	0.79	0.75	0.83	0.83				0.38

DISTRIBUTION WATER	01/2022	02/2022	03/2022	04/2022	05/2022	06/2022	07/2022	08/2022	09/2022	10/2022	11/2022	12/2022	Total	Avg	Max	Min
Residual No. 1 / Cl Residual: Free - mg/L																
Count IH	9	8	9	8	9	9	8	10	8	9	9	8	104			
Max IH	0.93	0.86	1.01	1.75	0.8	0.8	0.94	1.49	1.6	0.97	0.93	1.24			1.75	
Mean IH	0.782	0.791	0.868	0.9	0.694	0.662	0.732	1.379	1.279	0.864	0.8	0.949		0.895		
Min IH	0.71	0.7	0.71	0.62	0.63	0.57	0.62	1.24	0.71	0.72	0.54	0.68				0.54
Residual No. 2 / Cl Residual: Free - mg/L																
Count IH	9	8	9	8	9	9	8	10	8	9	9	8	104			
Max IH	1.02	1.04	1.04	1.01	0.75	0.96	0.94	1.59	1.66	1.04	0.96	1.02			1.66	
Mean IH	0.828	0.916	0.946	0.889	0.691	0.826	0.778	1.315	1.306	0.909	0.818	0.829		0.923		
Min IH	0.69	0.74	0.83	0.78	0.64	0.73	0.71	1.01	0.83	0.71	0.7	0.66				0.64
Residual No. 3 / Cl Residual: Free - mg/L																
Count IH	9	8	9	8	9	9	8	10	8	9	9	8	104			
Max IH	0.99	0.96	1.03	0.98	0.81	0.81	1.14	1.6	1.62	0.89	0.96	1.12			1.62	
Mean IH	0.854	0.865	0.928	0.893	0.714	0.743	0.844	1.442	1.264	0.837	0.866	0.955		0.937		
Min IH	0.73	0.76	0.83	0.76	0.65	0.66	0.7	1.27	0.79	0.79	0.82	0.76				0.65
Residual No. 4 / Cl Residual: Free - mg/L																
Count IH	5	4	4	4	5	4	4	5	4	5	4	4	52			
Max IH	0.87	0.97	0.95	1.03	0.8	0.76	0.98	1.43	1.56	1	0.97	1.13			1.56	
Mean IH	0.822	0.922	0.903	0.81	0.722	0.685	0.87	1.29	1.195	0.91	0.9	0.86		0.91		
Min IH	0.8	0.86	0.86	0.7	0.68	0.63	0.77	1.08	0.68	0.72	0.82	0.74				0.63

NOTE:
CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed for the Elk Lake water plant if the free chlorine residual level drops below 0.330 mg/L.