



## **KAPUSKASING DRINKING WATER SYSTEM**

### **ANNUAL AND SUMMARY REPORT 2023**

*Prepared by: Tammy Richard*

### QUALITY MANAGEMENT SYSTEM POLICY

*The Town of Kapuskasing Operating Authority understands the implications of the Drinking Water Quality Management Standard and that supplying safe drinking water is essential to the continual growth, prosperity and well-being of the community and its citizens. All personnel directly involved in the treatment and distribution of drinking water share in the responsibility of implementing, maintaining, and contributing to the continual improvement of the Quality Management System. The Operating Authority will ensure a consistent supply of aesthetically pleasing, clean and safe drinking water which meets legislative and regulatory requirements for all persons who are connected to the municipal drinking water distribution system.*

*Endorsed by council January 29, 2024*

## 1. GENERAL INFORMATION

The delivery of potable water in Ontario is regulated by the Ministry of Environment, Conservation and Parks (MECP) under the Safe Drinking Water Act. On June 1, 2003 O. Reg. 170/03 came into effect. Among the obligations, Reg. 170/03 prescribes the need for all owners of licensed water systems to produce an Annual Report that includes:

- A brief description of the drinking water system
- A list of water treatment chemical used
- A description of any major expenses incurred to install, repair, or replace equipment
- A summary of the most recent water test results
- A summary of adverse test results and other issues reported to the Ministry including corrective actions
- The Annual Report must be completed by February 28th of each year.

This Regulation also requires the owner to produce a Summary Report that includes:

- The requirements of the Safe Drinking Water Act, the regulations, the system's approval, Drinking Water Works Permit (DWWP), Municipal Drinking Water License (MDWL), and any orders applicable to the system that were not met at any time during the period covered by the report and specify the duration of the failure and describe the measures taken to correct the situation.
- A summary of quantities and flow rates of the water supplied during the period covered by the report including monthly averages and maximum daily flows.
- A comparison of this information to the rated capacity and flow rates approved in the system's approval, DWWP and/or MDWL.
- The Summary Report must be presented and accepted by Council by March 31st of each year.

The Summary and Annual Reports have been combined into one document, which is submitted to Council for approval. The purpose of this report is to keep the public and Council informed regarding the quality of the Town's drinking water and help demonstrate the ongoing provision of safe, consistent supply of high-quality drinking water.

All efforts have been made to ensure the information presented in this report is accurate. If you have any questions or comments related to this report, please contact Tammy Richard at the Kapuskasing Water Treatment at 705 337-4467 between the hours of 7am and 3pm.

A hard copy of the Annual and Summary Report will be made available free of charge at the Public Library after March 31, 2023. It will also be available for viewing on the Official Kapuskasing website at [www.kapusksasing.ca](http://www.kapusksasing.ca).

Drinking Water System Name:	Kapusksasing Drinking Water System
Drinking Water System Number:	220002583
Drinking Water System Owner and Operating Authority:	Corporation of the Town of Kapuskasing
Municipal Drinking Water License:	License Number: 213-101 Issue Number: 4 Issue Date: July 20, 2021 Expiry Date: July 19, 2026 Application Renewal Date: January 20, 2026
Drinking Water Works Permit:	Permit Number: 213-20 Issue Number: 4 Issue Date: July 20, 2021 Expiry Date: July 19, 2026
Permit to Take Water Number:	Permit Number: 3560-C5KRQC Issue Date: August 5, 2021 Expiry Date: August 5, 2031
Drinking Water System Category:	Large Municipal Residential
Drinking Water System Classification:	Water Treatment Subsystem (Class 3) Water Distribution Subsystem: (Class 1)
Period covered by report:	January 01 to December 31, 2023

## 2. ANNUAL REPORT - DRINKING WATER SYSTEM REGULATION O. REG 170/03 SECTION 11

### 2.1 Drinking Water System Description

The Corporation of the Town of Kapuskasing owns, operates, and maintains the Kapuskasing Water Treatment Plant and Distribution System.

The hydrated lime softening system has been in operation since early 2006. Lime softening is a process used to reduce hardness, iron, and manganese concentrations in water supplies. Water hardness is caused by the dissolved salts of calcium and magnesium. It causes build up and deposits in pipes

and hot water heaters as well as wastes soap and leaves spots on dishes. Iron and manganese stain laundry and fixtures.

Groundwater is supplied by three wells and pumping stations located south of Hwy 11 along Clear Lake Road. The plant consists of two blanket clarifiers, a re-carbonation system, three concrete dual media gravity filters and two underground disinfection contact chambers with three high lift pumps.

At the plant, lime and activated silica are added to the raw water to increase the pH and cause the calcium, magnesium, iron and manganese to precipitate and settle in the clarifiers. The water is then conveyed through a re-carbonation tank where carbon dioxide is introduced to adjust the pH to normal levels. The water then flows to two of the three conventional gravity filters to remove the remaining particles. At that point, the water is directed to a two chamber clearwell where sodium hypochlorite is injected for disinfection. Aqueous ammonia is added in the high lift pump discharge header immediately downstream of the post trim chlorination point, to convert the free chlorine to a combined chlorine residual in a process referred to as chloramination.

Water is pumped through an 18” transmission main to an elevated water tower with storage capacity of 4560 m<sup>3</sup> or 1,003,000 gallons. It has sufficient capacity to address the hydraulic requirements for the Town of Kapuskasing, under both Peak Flow and Fire Flow situations. The plant and well #1 are equipped with emergency diesel generators that allow water to be pumped, treated and distributed in the event of a power outage.

## 2.2 List of Chemicals Used

CHEMICAL	PURPOSE
Hydrated Lime	primary coagulant, used for precipitation and softening
Lime Clear	helps the hydrated lime softening process
Activated Silica (sodium bicarbonate and sodium silicate)	coagulant aid
Carbon Dioxide	recarbonation and pH control
Sodium Hypochlorite	primary disinfection
Aqueous Ammonia	secondary disinfection and chloramination

## 2.3 Major Expenses Incurred to Install, Repair or Replace Equipment

To maintain the safe and efficient operation of the water system, maintenance and capital projects are undertaken. All major repairs or upgrade projects that took place during the reporting period are listed below.

### Waterplant

- Repair Well #1 generator \$ 20 132.29
- Purchase spare activated silica pump \$ 7 830.90
- Hydrovac to clean chemical tanks, filter tanks and outside sludge tank \$ 2 839.13
- Purchase spare mixer for hydrated lime \$ 8 629.81
- Sludge lagoon maintenance \$ 16 045.80

**Distribution**

- Purchase of Neptune Smart Meters \$ 32 345.00

**Connecting link (Gurney to Service Master)**

- Replace 21 meters of 300mm watermain, 600.1 meters of 400mm watermain, 8 water services, one 150mm gate valve and box, one 400mm gate valve and box, 4 fire hydrants \$ 754 528.33

**Brunelle Road North**

- Replace 116.6 meters of 150mm watermain, 480.5 meters of 400mm watermain, 31 water services, eight 150mm gate valve, one 400mm gate valve, 4 fire hydrants \$ 375 568.20

## 2.4 Water Sampling and Testing

### a) Microbiological testing

At a minimum, one bacteriological sample is collected and tested for E. coli and total coliform weekly from raw water and treated water at the facility and five from the distribution system. In distribution, at least 8 samples plus one additional for every 1000 people served by the system are required each month, with at least one being taken each week. Any E. coli or total coliform results above 0 in treated or distribution samples must be reported to the Ministry of Environment, Conservation and Parks (MECP) and the Medical Officer of Health (MOH). When necessary, resamples and any other required actions are taken as quickly as possible.

HPC analyses are also required from treated and distribution water. The tests are required weekly for one treated water sample and 25% of the distribution system bacteriological samples. HPC should be less than 500 colonies per 1mL. Results over 500 colonies per 1mL may indicate a change in water quality but it is not considered an indicator of unsafe water.

#### Schedule 10 – Weekly Microbiological Testing

Sample Type	Number of Samples Taken	Total Coliform Results (cfu/100mL)	E. coli Results (cfu/100mL)	Number of HPC Samples Taken	HPC Results (cfu/100mL)
Well # 1 (Raw)	52	1 sample with 1 coliform	0	n/a	n/a
Well # 2 (Raw)	52	1 sample with 1 coliform 1 sample with 4 coliform	0	n/a	n/a
Well # 3 (Raw)	52	0	0	n/a	n/a
Treated	52	0	0	52	0-40
Distribution	260	0	0	104	70 samples <10 34 samples 10-80 1 sample >2000

**b) Operational testing**
**Well #1 (Raw)**

Parameter	Number of Samples Taken	Range of Results	Average Value
Turbidity	51	0.13-1.64 ntu	0.65
Color	51	0-102 acu	26
Hardness	51	254-270 mg/L	264
Alkalinity	51	240-310 mg/L	250

**Well #2 (Raw)**

Parameter	Number of Samples Taken	Range of Results	Average Value
Turbidity	51	0.26-3.81 ntu	1.07
Color	51	132-241 acu	166
Hardness	51	148-180 mg/L	159
Alkalinity	51	135-170 mg/L	146

**Well #3 (Raw)**

Parameter	Number of Samples Taken	min-max values	Average Value
Turbidity	51	0.41-3.73 ntu	1.11
Color	51	6-122 acu	56
Hardness	51	348-376 mg/L	353
Alkalinity	51	282-350 mg/L	294

**Raw Physical & Chemical Parameters**

Parameters	Well #1		Well #2		Well #3	
	November 8, 2016	January 12, 2021	November 8, 2016	January 12, 2021	November 8, 2016	January 12, 2021
Aluminum	<0.001	0.018	0.0061	0.01	<0.001	0.001
Antimony	<0.0005	<0.0005	0.0009	0.0588	<0.005	<0.005
Arsenic	<0.001	<0.01	<0.001	<0.1	<0.001	<0.001
Barium	0.0792	0.090	0.0453	0.04	0.0964	0.121
Beryllium	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005
Bismuth	<0.001	<0.001	<0.001	0.013	<0.001	<0.001
Boron	0.15	0.015	0.0092	<0.02	0.015	0.016
Bromide	<0.1	<0.05	<0.1	<0.05	<0.1	<0.05
Cadmium	0.0001	<0.0001	0.0001	<0.001	<0.0001	<0.0001
Calcium	78.8	76	56.7	46.3	88.3	90.9
Cerium	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001
Cesium	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Chloride	1.9	2.4	3.3	2.8	2.18	4.5
Chromium	0.001	0.005	<0.001	<0.01	0.001	0.005
Cobalt	0.00153	0.0016	<0.0001	<0.001	<0.0001	0.0002

Copper	0.0078	0.004	0.0034	<0.01	0.0067	0.003
Europium	<0.001	<0.001	<0.001	0.049	<0.001	<0.001
Fluoride	0.1	0.15	<0.1	0.07	0.2	0.27
Gallium	0.002	0.002	<0.001	<0.01	0.002	0.002
Iron	0.170	0.42	0.0473	0.6	1.720	2.5
Lanthanum	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	0.0001	<0.0001	<0.0001	<0.05	<0.001	<0.0001
Lithium	<0.005	<0.005	0.005	6.53	<0.005	0.006
Magnesium	14.6	15.400	7.87	0.13	18.3	16.700
Manganese	0.025	0.297	0.122	<0.001	0.0771	0.085
Mercury	<0.0001	<0.0001	<0.0001	<0.1	<0.0001	<0.0001
Molybdenum	0.001	0.001	0.001	<.01	<0.001	<0.001
Nickel	0.0033	0.004	0.001	<0.01	0.002	0.004
Niobium	0.001	<0.001	<0.001	0.044	<0.001	<0.001
Phosphorus	<0.050	<0.05	0.050	<0.05	0.050	<0.05
Potassium	4.6	4.5	3.290	3	4.710	4.2
Rubidium	0.0032	0.003	0.0032	<0.01	0.0046	0.005
Scandium	0.001	0.001	0.001	<0.01	0.002	0.003
Selenium	<0.001	<0.0005	<0.001	<0.005	<0.001	<0.0005
Silicon	4.7	5.2	3.800	<6	7.070	7.5
Silver	<0.0001	<0.0001	<0.0001	0.0453	<0.0001	<0.0001
Strontium	0.108	0.012	0.114	0.10	0.145	0.183
Sulphate	16.8	17.3	1	2.5	42.6	57.9
Sulfur	6.60	4.8	<0.8	<8	16.5	15.9
Tellurium	<0.001	<0.001	<0.001	0.146	<0.001	<0.001
Thallium	<0.0001	<0.0001	0.0001	0.0106	<0.0001	<0.0001
Thorium	0.001	<0.001	<0.001	0.018	<0.001	<0.001
Tin	0.001	<0.001	<0.001	<0.01	<0.001	<0.001
Titanium	0.001	<0.001	0.002	0.01	0.001	<0.001
Tungsten	<0.001	<0.001	<0.001	0.211	<0.001	<0.001
Uranium	0.001	0.002	<0.001	0.029	<0.001	<0.001
Vanadium	<0.001	0.001	0.0034	<0.01	<0.001	0.001
Yttrium	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001
Zinc	0.008	<0.001	0.0064	<0.01	0.0051	<0.001
Zirconium	<0.001	<0.001	0.0077	<0.01	<0.001	0.001
Alkalinity	221	268	171	155	230	296
Color ( true )	3	6	60.4	58	4	6
Sodium	2.9	3.1	1.77	2	4.43	3.7
pH (pH unit)	7.61	7.06	7.81	7.3	7.58	7.42
Nitrate as N	<0.1	<0.05	<0.01	<0.05	<0.01	<0.05
Nitrite as N	<0.03	<0.05	<0.03	<0.05	<0.03	<0.05
Total Dissolved	110	320	40	290	190	410

Sample required every 60 months. Next sampling scheduled for 2026.

**Treated Water Parameters**

Parameter	Number of Samples Taken	Min-Max values	Average value	Ontario Objective
Hardness	312	40-290*	78	80 to 100 mg/l
Alkalinity	312	58-290	78	30 to 500 mg/l

\*Hardness expressed in grains 2.3-16.6 (4.5 average)

**Schedule 6 - Chlorine Residual Testing**

Location	Number of Samples	Minimum Value (mg/L)	Maximum Value (mg/L)	Average Value (mg/L)
Post Trim Free Chlorine Residual (Continuous)	8760	0.37	2.06	1.24
Distribution Combined Chlorine Residual (Continuous)	8760	0.46	2.64	1.69
Weekly Distribution Combined Chlorine Residual	255	0.30	1.98	1.48

8760 is used as the number of samples for one year of continuous monitoring.

**c) Chemical testing**
**Schedule 13 - Nitrate and Nitrite in the distribution system**

Date of sample	Nitrate Result (MAC 10.0 mg/L)	Nitrite Result (MAC 1.0 mg/L)	Exceedance
January 10, 2023	0.3	<0.01	No
April 11, 2023	0.2	<0.01	No
July 11, 2023	<0.1	<0.01	No
October 10, 2023	0.2	0.02	No

Samples are required every 3 months from the water treatment plant.

**Schedule 13 - Total Trihalomethane in the distribution system**

Date of sample	THM Result (ug/L)	Running Average (MAC 100 ug/L four quarter running average)	Exceedance
January 10, 2023	27.2	28.03	No
April 11, 2023	22.5		
July 11, 2023	29		
October 10, 2023	33.4		

Samples are required every 3 months from the distribution system.



**Schedule 13 – Haloacetic Acids in the distribution system**

Date of sample	HAA Result (ug/L)	Running Average (MAC 80 ug/L four quarter running average)	Exceedance
January 10, 2023	30	26	No
April 11, 2023	30		
July 11, 2023	21		
October 10, 2023	23		

Samples are required every 3 months from the distribution system.

**Schedule 13 – Sodium at the Water Treatment Plant**

Date of sample	Result (mg/L)	MAC (mg/L)	Exceedance
February 14, 2023	8.16	20	No

Samples are required every 5 years. Next sampling scheduled for February 2028.

**Schedule 13 - Fluoride at the Water Treatment Plant**

Date of sample	Result (mg/L)	MAC (mg/L)	Exceedance
February 14, 2023	0.13	1.5	No

Samples are required every 5 years. Next sampling scheduled for February 2028.

**Organic and inorganic Parameters**

The Maximum Allowable Concentration (MAC) for organic and inorganic parameters are set under the Ontario Drinking Water Standards. If the concentration of a chemical parameter is above half the MAC, testing frequency would be increased as per regulation.

**Schedule 13 & 23 – Inorganic parameters at the Water Treatment Plant**

	Parameter	Sample result (ug/L)				MAC	Exceedance
		February 6, 2013	February 9, 2016	February 5, 2019	February 8, 2022		
1	Antimony	<0.5	<0.05	<0.05	<0.05	6	No
2	Arsenic	<1	<1	<1	<1	10	No
3	Barium	3.8	6.1	5	6	1000	No
4	Boron	5.9	10.1	8	6	5000	No
5	Cadmium	<0.1	<0.1	<0.01	<0.1	5	No
6	Chromium	1.2	1.5	2	<1	50	No
7	Mercury	<0.01	<0.01	<0.1	<0.1	1	No
8	Selenium	<1	<1	<0.5	<0.2	50	No
9	Uranium	<1	<1	1	<1	20	No

Sample required every 36 months. Next sampling scheduled for February 2025.

**Schedule 13 & 24 - Organic Parameters at the Water Treatment Plant**

	Parameter	Sample results (ug/L)				MAC	Exceedance
		February 6, 2013	February 9, 2016	February 5, 2019	February 8, 2022		
1	Alachlor	<0.4	<0.4	<0.223	<0.232	5	No
2	Atrazine + N-dealkylated metabolites	<0.9	<0.09	<0.05	<0.5	5	No
3	Azinphos-methyl	<0.3	<0.3	<0.168	<0.174	20	No
4	Benzene	<0.2	<0.2	<0.1	<0.1	1	No
5	Benzo(a)pyrene	<0.009	<0.005	<0.009	<0.009	0.01	No
6	Bromoxynil	<0.5	<0.09	<0.0876	<0.115	5	No
7	Carbaryl	<1	<2	<1	<1	90	No
8	Carbofuran	<1	<2	<1	<2	90	No
9	Carbon Tetrachloride	<0.02	<0.2	<0.2	<0.2	2	No
10	Chlorpyrifos	<0.03		<0.168	<0.174	90	No
11	Diazinon	<0.03	<0.3	<0.168	<0.174	20	No
12	Dicamba	<0.02	<0.08	<0.0766	<0.101	120	No
13	1,2-Dichlorobenzene	<0.02	<0.2	<0.3	<0.3	200	No
14	1,4-Dichlorobenzene	<0.02	<0.2	<0.3	<0.3	5	No
15	1,2-dichloroethane	<0.02	<0.2	<0.2	<0.3	5	No
16	1,1-Dichloroethylene (vinylidene chloride)	<0.02	<0.2	<0.3	<0.3	14	No
17	Dichloromethane	<5	<1	<1	<1	50	No
18	2,4-Dichlorophenol	<0.5	<0.2	<0.2	<0.2	900	No
19	2,4-Dichlorophenoxy acetic acid (2,4-D)	<0.2	<0.08	<0.328	<0.432	100	No
20	Diclofop-methyl	<0.2	<0.08	<0.109	<0.144	9	No
21	Dimethoate	<0.3	<.03	<0.168	<0.174	20	No
22	Diquat	<7	<7	<0.07	<0.2	70	No
23	Diuron	<7	<8	<6	<7	150	No
24	Glyphosate	<20	<20	<20	<20	280	No
25	Malathion	<0.3	<0.3	<0.168	<0.174	190	No
26	2-Methyl-4- chlorophenoxyacetic acid (MCPA)	-	<0.12	<5.47	<7.2	100	No
27	Metolachlor	<0.2	<0.2	<0.112	<0.116	50	No
28	Metribuzin	<0.2	<0.2	<0.112	<0.116	80	No
29	Monochlorobenzene		<0.2	<0.5	<0.5	80	No
30	Paraquat	<1	<1	<0.3	<0.2	10	No
31	Pentachlorophenol	<0.5	<0.6	<0.3	<0.3	60	No
32	Phorate	<0.3	<0.2	<0.112	<0.116	2	No
33	Picloram	<0.5	<0.08	<0.0766	<0.101	190	No
34	Polychlorinated Biphenyls (PCB)	<0.004	<0.12	0.06		3	No
35	Prometryne	<0.2	<0.1	<0.0559	<0.058	1	No
36	Simazine	<0.3	<0.3	<0.168	<0.174	10	No
37	Terbufos	<0.2	<0.1	0.112	<0.116	1	No
38	Tetrachloroethylene (perchloroethylene)	<0.2	<0.2	<0.3	<0.03	10	No
39	2,3,4,6- Tetrachlorophenol	<0.5	<0.6	<0.3	<0.3	100	No
40	Triallate	<0.2	<0.2	<0.112	<0.116	230	No

41	Trichloroethylene	<0.2	<0.2	<0.2	<0.02	5	No
42	2,4,6-Trichlorophenol	<0.5	<0.5	<0.2	<0.2	5	No
43	Trifluralin	<0.2	<0.2	<0.112	<0.116	45	No
44	Vinyl Chloride	<0.2	<0.2	<0.1	<0.01	1	No

Sample required every 36 months. Next sampling scheduled for February 2025.

#### d) Lead testing

##### Schedule 15.1 -Lead in Distribution

Sample Period	Number of Samples	pH Range (2023)	Alkalinity Range (2023)	Lead Range (ug/L) (2021)
December 15 to April 15	3	8.56-8.62	84-90	0.1/0.2
June 15 to October 15	3	7.59-7.80	80-82	<0.1/74.2

Next lead sampling scheduled for winter and summer 2024. In 2022 and 2023, sampling is required for pH and alkalinity only.

#### e) Environmental discharge, residue Management

##### Municipal Drinking Water License (MDWL)

Sample Type	Number of Samples	Minimum	Maximum	Average	MAC
Total suspended solids	12	1	47	11.5	50 mg/L (12-month average)
pH (prior to each discharge)	311	7.05	8.59	n/a	6.5-8.5

## 2.5 Adverse Quality Reports and Exceedances

The drinking water regulations identify several “Indicators of Adverse Water Quality” for which the waterworks must immediately notify health officials and the Ministry. These refer to any test result from treated or distributed drinking water that does not meet a provincial water quality standard or a situation where disinfection of the water may be compromised.

The Kapuskasing Drinking Water System met all provincial water quality standards in 2023 and there are no incidents where disinfection of the water was compromised.

### 3. SUMMARY REPORT TO MUNICIPALITIES - DRINKING WATER SYSTEM REGULATION O. REG 170/03 SCHEDULE 22

#### 3.1 Requirements the System Failed to Meet

There are 4 incidents of failing to meet the requirements in 2023.

##### a) Residual discharge

The Kapusksasing Drinking Water System failed to meet its residual discharge requirements on one occasion in 2023. The incident was reported to SAC and MOH.

##### AWQI #1-4-FI6TX

Incident Date	March 9, 2023
Parameter	pH
Result	8.59
Details	The pH in the wastewater holding tank exceeded the maximum concentration of 8.5 and was discharged into the environment (Creek).
Corrective Action	No corrective action needed
Date resolved	March 10, 2023

##### b) Form 2

A “Form 2” and a “Director Notification Form” were not prepared and submitted as required by the Drinking Water Works Permit (DWWP) when a second sodium hypochlorite storage tank was installed at the WTP.

##### c) Monitoring

On July 9, 2023, a power outage at the Kapusksasing water tower resulted in a loss of secondary disinfection monitoring for approximately 6 hours and 15 minutes (1:25 PM until 7:40 PM) when the standby generator did not start. This is a violation of the minimum testing and recording frequency prescribed in O. Reg. 170/03. The table specifies a minimum testing and recording frequency of 1 hour for free and total chlorine residual measured for the purpose of determining secondary disinfection.

##### d) Alarm

During the power outage mentioned above, the alarm failed to alert operators that the continuous analyzers had lost power as the Verbatim (auto dialer) at the WTP was frozen. This is a violation of subsections 6-5 (1)5 and 6- 5(1.1) of Schedule 6 of O. Reg. 170/03 which requires continuous analyzers to be equipped with an automatic shut-off feature or designed and operated such that an alarm sounds immediately if the equipment malfunctions, loses power, or a test result for a parameter is above or below the alarm standard.

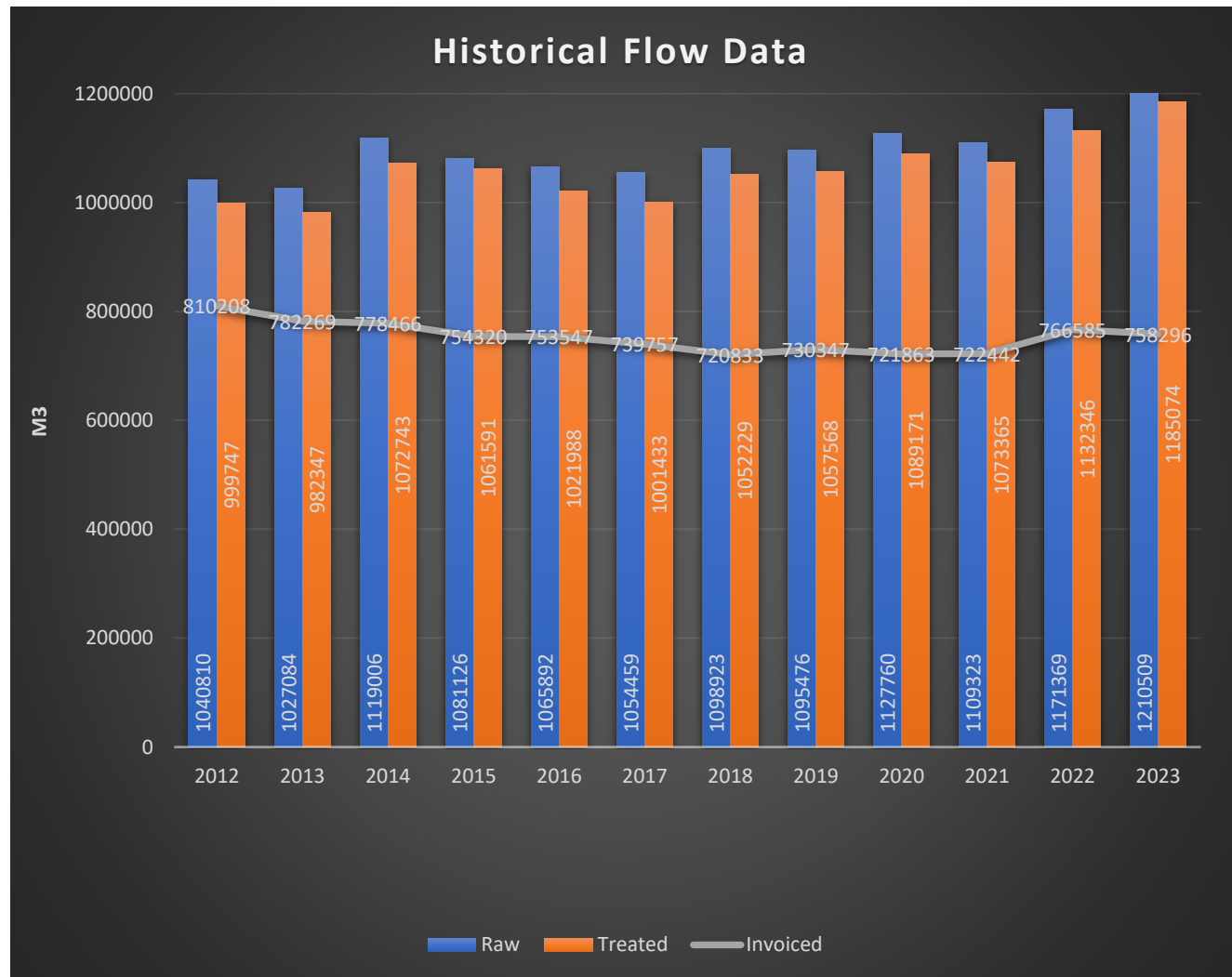
### 3.2 Summary of Quantities and Flow Rates

#### a) Raw Water

	Average Daily Volume (m <sup>3</sup> /day)	Max Daily Volume (m <sup>3</sup> /day)	Peak Flow Rate (L/sec)	Total Monthly Flow (m <sup>3</sup> )
January	3445	4340	75.0	106 286
February	3352	3937	74.01	93 864
March	3403	4471	74.21	105 510
April	3431	4519	73.78	102963
May	3665	4929	73.17	113 629
June	3487	4779	75.08	104 608
July	3364	4742	72.41	104 310
August	3161	4118	71.29	97 996
September	2956	3808	69.66	88 668
October	3037	4287	73.04	94 133
November	3609	4762	70.85	108 269
December	2912	4062	69.94	90 276
<b>TOTAL</b>				<b>1 210 509</b>

#### b) Treated Water

	Average Daily Volume (m <sup>3</sup> /day)	Max Daily Volume (m <sup>3</sup> /day)	Total Monthly Volume (m <sup>3</sup> )
January	3346	4285	103 756
February	3286	3851	92 018
March	3378	4505	104 730
April	3360	4387	100 799
May	3601	4767	111 641
June	3451	4733	103 515
July	3293	4669	102 091
August	3085	4101	95 629
September	2867	3715	86 023
October	2951	4191	91 482
November	3531	4694	105 937
December	2821	4145	87 453
<b>TOTAL</b>			<b>1 185 074</b>



HISTORICAL DATA Year	Raw Total Volume (m3)	Treated Total Volume (m3)	Invoiced Total Volume (m3)	Unaccounted for (m3)	Unaccounted for (%)
2012	1,040,810	999,747	810,208	189,539	19
2013	1,027,084	982,347	785,269	197,078	20
2014	1,119,006	1,072,743	778,466	294,277	27
2015	1,081,126	1,061,591	754,320	307,271	29
2016	1,065,892	1,021,988	753,547	268,441	26
2017	1,054,459	1,001,433	739,757	261,676	26
2018	1,098,923	1,052,229	720,883	331,346	31
2019	1,095,476	1,057,568	730,347	327,221	31
2020	1,127,760	1,089,171	721,863	367,308	34
2021	1,109,323	1,073,365	722,442	350,923	33
2022	1,171,369	1,132,346	766,585	365,761	32
2023	1,210,509	1 185 074	758,296	426,778	36

### 3.3 Summary of Quantities and Flow Rates

The Kapuskasing Drinking Water System's Permit to Take Water allows the town to withdraw water at a maximum flow rate of 2,270 liters per minute to a maximum of 3,268,800 liters per day (3,268.8 m<sup>3</sup>) from each well, and up to a combined maximum of 6,566,400 liters (6,566.4 m<sup>3</sup>) per day from all sources. We recorded the highest flow rate of 75.08 l/s on June 6<sup>th</sup> and the maximum daily volume of 4,929 m<sup>3</sup> on May 30 with two wells running on both occasions.

The Municipal Drinking Water License requires the maximum daily flow of treated water that flows from the treatment system to the distribution system (water tower) not exceed 6,566 m<sup>3</sup>/day. The highest single day flow was recorded on May 30 at 4,767 m<sup>3</sup>/day which is below the acceptable limit for this system.

A total of 1 185 074 m<sup>3</sup> of water was treated in 2023 which represents an increase of 4.5 from last year.