
The 2024 Annual Drinking Water Quality Report

Kenora Water Treatment Plant

March 2025



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Introduction

The City of Kenora (City) continually provides safe drinking water to all of our customers. As mandated by the *Safe Drinking Water Act 2002, Ontario Regulation 170/03* this annual Water Quality Report includes:

- a description of the water treatment process and chemicals used;
- any major expenses to install, repair or upgrade equipment in the system;
- the results of our water tests and how they compare to provincial regulatory standards;
- a summary of incidents of regulatory non-compliance and the corrective actions taken; and,
- a summary of the quantities and water production rates of water supplied, with a comparison to the rated capacity and approved flow rates of the system

Kenora Water Treatment Plant

Municipal Drinking Water License: 228-101

Drinking Water System: 220001423

The Kenora Water Treatment Plant (WTP) is located at 5 7th Street South and has a rated capacity of 25 ML/d (million litres per day) of treated drinking water. The raw water source is Lake of the Woods under Permit to Take Water 442-9W7KXC.

This facility is a conventional filtration treatment plant with a process that consists of coagulation, upflow pulsator clarification, dual media filtration (anthracite/sand), fluoridation, pH adjustment, and chloramination for secondary disinfection. The treatment chemicals used in the current reporting year were:

- chlorine gas (seasonal low lift wet well chlorination, disinfection, chloramination);
- sodium silicofluoride (fluoridation);
- aluminum sulphate (coagulation);
- polymer (coagulation aid);
- sodium hydroxide (pH adjustment)
- ammonium sulphate (chloramination for secondary disinfection)

The WTP is controlled through a Supervisory Control and Data Acquisition (SCADA) system that is monitored twenty-four hours per day, seven days per week. The treated drinking water is pumped into the Kenora Drinking Water System and is distributed to connected residents and water haulage customers.

Kenora Water Distribution System

The City's Water Distribution System consists of 136km of piping, 3 standpipes (Kenora Zone 1, Kenora Zone 2, Keewatin), and 5 booster stations (Brinkman Zone 2 Booster, Zone 3 Booster, Zone 4 Booster, Norman Booster, Pine Portage Booster) for pressurization and distribution of water between zones.

The drinking water system also provides drinking water to two private subsystems which are located on Rocky Heights Road, and on Wauzhushk Onigum Nation.

2024 Capital Improvements

In the current reporting year, approximately \$1,152,000 was spent on capital upgrades at the Kenora WTP and outlying Booster Station and Standpipes. Projects included:

Project	Expense Type	Location	Value
Park Street from 10 th Avenue South to Maple Street	Replacement	Distribution	\$566,000
Mikado Avenue from 10 th Street North to end of service, and 10 th Street North from Mikado Avenue to Rupert Road	Replacement	Distribution	\$406,000
Preston Street from Dead End to 8 th Street North	Replacement	Distribution	\$144,000
Pump Rebuilds at Brinkman Booster, Zone 4 Booster, and Pine Portage Booster	Repair	Distribution	\$14,400
Ultrasonic Level Measurement for Bulk Chemical Tanks	Install	WTP	\$7,200
Online Turbidimeter and Controller for West Clarifier	Install	WTP	\$14,000

In addition to capital upgrades, the City continues to enhance public health protection from the Water Treatment Plant to household tap through water sampling and monitoring, ongoing upgrades to the SCADA monitoring and infrastructure management systems, oversight of water connections to the distribution system, and backflow prevention. These practices undergo continual improvement through the annual review of the Drinking Water Quality Management System. Maintaining and updating the City's Drinking Water Quality Management System is a provincially legislated requirement of a licensed municipal drinking water system.

Water Quality Testing

The City performs water quality tests each and every day, in accordance with the *Safe Drinking Water Act, 2002* and regulations. The following sections provide a summary of the test results.

Terms

CFU/100 mL: Colony-forming units per 100 millilitres of water

µg/L: micrograms per litre

mg/L: milligrams per litre

Standard: Ontario Drinking Water Quality Standard, O.Reg. 169/03

E. Coli: Escherichia coli; Bacteria associated with the intestinal tracts of humans and animals

Coliforms: Bacteria that can be associated with human or animal waste

Summary of Microbiological Testing Results

	Number of Samples	<i>E. coli</i> Results (min - max)	Total Coliform Results (min - max)	Number of Heterotrophic Plate Count* Samples	Heterotrophic Plate Count Results (min - max)
Raw Water	52	0 - 7	0 - 461	N/A	N/A
Treated Water	52	Absent	Absent	52	0 - 4
Distribution	358	Absent	Absent	104	0 - 10

Microbiological standards for treated and distributed water:

E.coli Not Detectable

Total Coliforms Not Detectable

HPC Heterotrophic Plate Counts are conducted on some treated and distribution system samples. The HPC test is used as a tool to monitor overall quality, but the results are not indicators of water safety. There is no Drinking Water Quality Standard for HPC.

Operational Testing

Kenora's WTP uses continuous analyzers to measure and record the results of chlorine residual, turbidity and fluoride residual throughout the treatment process in the treated water, and drinking water system several times per minute, twenty-four hours per day, seven days per week. The readings are validated by an operator and are reviewed by the Ministry of the Environment, Conservation and Parks (MECP) Inspector. Kenora operators measure the chlorine in the distributed water. 'Adverse' test results must be reported if there is an indication that primary inactivation (disinfection) may not have been achieved, if the turbidity of filtered water is >1.0 Nephelometric Turbidity unit (NTU), if the fluoride residual is >1.5 mg/L or if a free chlorine residual in the distribution system is <0.25 mg/L.

Summary of Operational Testing Results

In Plant Monitoring Results

Parameter	Units	Samples	WTP Result Minimum	WTP Result Maximum	Adverse
Raw Water Turbidity	NTU	83	0.468	7.07	
Raw Water pH	pH	53	6.95	8.13	
Raw Water Colour	PtCo	53	20	74	
Raw Water Alkalinity	mg/L CaCO ₃	53	40	56	
Raw Dissolved Organic Carbon	mg/L	3	9.56	13.3	
Filter #1 Effluent Turbidity	NTU	Continuous Monitoring	0.029	0.283	No
Filter #2 Effluent Turbidity	NTU	Continuous Monitoring	0.021	0.329	No
Filter #3 Effluent Turbidity	NTU	Continuous Monitoring	0.023	1.058	No
Filter #4 Effluent Turbidity	NTU	Continuous Monitoring	0.031	0.766	No
Fluoride Residual	mg/L	Continuous Monitoring	0.20	0.92	No
Clearwell Effluent Chlorine Residual	mg/L	Continuous Monitoring	0.63	3.46	No

Operational standards for treated water:

Chlorine Residual Reportable: <0.25 mg/L, >4 mg/L

NTU >1.0

Fluoride Residual Reportable: >1.5 mg/L

Terminology

Residual: Concentration of active component in the water

NTU: Nephelometric Turbidity unit – Measures the presence of suspended material in water no greater than 1 unit (>1.0)

PtCo: Platinum Cobalt Colour Scale – Assesses organic levels in water

CaCO₃: Calcium Carbonate – Assesses hardness of water

CFU/100ml – Number of colony forming microbial cells per 100ml of water sample

Distribution Monitoring Results

Sample Type	Units	Samples	Minimum Result	Maximum Result	Adverse
Distribution Chlorine Residual	mg/L	468	0.60	2.17	No
Non-Routine Distribution Chlorine Residuals	mg/L	152	0.01	2.20	1*

*Noted in 'Adverse' Results Notifications

Operational standards for distribution water:

Chlorine Residual Reportable: <0.25 mg/L, >3 mg/L

Terminology

Non-Routine Sampling driven by watermain repairs, construction, and water quality complaints

Summary of Chemical Testing Results

Inorganic Parameters – Treated Water (unless otherwise noted)

Parameter	Sample Date	Units	WTP Result	Standard Limit	Exceedance of Standard
Antimony	01/22/24	µg/L	<0.60	6	No
Arsenic	01/22/24	µg/L	<1.0	10	No
Barium	01/22/24	µg/L	<10	1000	No
Boron	01/22/24	µg/L	<50	5000	No
Cadmium	01/22/24	µg/L	<0.10	5	No
Chromium	01/22/24	µg/L	<1.0	50	No
Mercury	01/22/24	µg/L	<0.100	1	No
Selenium	01/22/24	µg/L	<1.0	50	No
Sodium	01/22/24	µg/L	14.0	20	No
Uranium	01/22/24	µg/L	<2.0	20	No
Nitrite (Maximum)	Quarterly	mg/L	0.180	10	No
Nitrate (Maximum)	Quarterly	mg/L	<0.010	1	No

Organic Parameters – Treated Water (unless otherwise noted)

Parameter	Sample Date	Units	WTP Result	Standard Limit	Exceedance of Standard
Alachlor	01/22/24	µg/L	<0.050	5	No
Atrazine + N-dealkylated metabolites	01/22/24	µg/L	<0.14	5	No
Azinphos-methyl	01/22/24	µg/L	<0.100	20	No
Benzene	01/22/24	µg/L	<0.50	1	No
Benzo(a)pyrene	01/22/24	µg/L	<0.0050	0.01	No
Bromoxynil	01/22/24	µg/L	<0.250	5	No
Carbaryl	01/22/24	µg/L	<0.050	90	No
Carbofuran	01/22/24	µg/L	<0.0250	90	No
Carbon Tetrachloride	01/22/24	µg/L	<0.20	2	No
Chlorpyrifos	01/22/24	µg/L	<0.10	90	No
Diazinon	01/22/24	µg/L	<0.0250	20	No
Dicamba	01/22/24	µg/L	<0.10	120	No
1,2-Dichlorobenzene	01/22/24	µg/L	<0.50	200	No
1,4-Dichlorobenzene	01/22/24	µg/L	<0.50	5	No
1,2-Dichloroethane	01/22/24	µg/L	<0.50	5	No
1,1-Dichloroethylene (vinylidene chloride)	01/22/24	µg/L	<0.50	14	No
Dichloromethane	01/22/24	µg/L	<1.0	50	No
2-4 Dichlorophenol	01/22/24	µg/L	<0.30	900	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	01/22/24	µg/L	<0.050	100	No
Diclofop-methyl	01/22/24	µg/L	<0.100	9	No
Dimethoate	01/22/24	µg/L	<0.050	20	No
Diquat	01/22/24	µg/L	<1.0	70	No
Diuron	01/22/24	µg/L	<0.050	150	No
Glyphosate	01/22/24	µg/L	<0.20	200	No
Distribution HAA (Running Annual Average)	Quarterly	µg/L	30.2	80	No
2-Methyl-4- chlorophenoxyacetic acid (MCPA)	01/22/24	µg/L	<0.050	100	No
Malathion	01/22/24	µg/L	<0.0250	190	No

Metolachlor	01/22/24	µg/L	<0.0250	50	No
Metribuzin	01/22/24	µg/L	<0.100	80	No
Monochlorobenzene	01/22/24	µg/L	<0.50	80	No
Distribution N-Nitrosodimethylamine (NDMA Maximum)	Quarterly	ng/L	2.1	9	No
Paraquat	01/22/24	µg/L	<1.0	10	No
Pentachlorophenol	01/22/24	µg/L	<0.50	60	No
Phorate	01/22/24	µg/L	<0.250	2	No
Picloram	01/22/24	µg/L	<0.50	190	No
Polychlorinated Biphenyls (PCB)	01/22/24	µg/L	<0.030	3	No
Prometryne	01/22/24	µg/L	<0.0250	1	No
Simazine	01/22/24	µg/L	<0.100	10	No
Distribution THM (Running Annual Average)	Quarterly	µg/L	42.1	100	No
Terbufos	01/22/24	µg/L	<0.50	1	No
Tetrachloroethylene (perchloroethylene)	01/22/24	µg/L	<0.50	10	No
2,3,4,6-Tetrachlorophenol	01/22/24	µg/L	<0.50	100	No
Triallate	01/22/24	µg/L	<0.100	230	No
Trichloroethylene	01/22/24	µg/L	<0.50	5	No
2,4,6-Trichlorophenol	01/22/24	µg/L	<0.50	5	No
Trifluralin	01/22/24	µg/L	<0.10	45	No
Vinyl Chloride	01/22/24	µg/L	<0.50	1	No

‘Adverse’ Results Notifications

The following tables show the notices of ‘adverse’ water quality results submitted in accordance with the *Safe Drinking Water Act, 2002* to the MECP and the Medical Officer of Health.

Sample Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
September 17th, 2024	Distribution	Low Chlorine	System flushed, resampled, and resample results passed	October 1st, 2024

Terms

CFU/100 mL - Colony-forming units per 100 milliliters of water

Community-Wide Lead Sampling Program Results

Under Schedule 15.1 of O. Reg. 170/03 the City of Kenora meets the requirements for reduced sampling. Previous rounds of residential plumbing sampling indicated lead levels did not meet the threshold required for continued annual testing, so lead samples are currently taken from distribution locations every three years. Sampling requirements in 2024 included distribution lead samples.

Sample Type	Samples Taken	Microcystin Results Range (ug/L)		Microcystin Regulation (ug/L)
Distribution	8	<1.0	<1.0	10

Microcystin Sampling Results

Under the direction of the MECP, Microcystin-LR samples were collected on a weekly basis from June to October from the WTP.

Sample Type	Samples Taken	Microcystin Results Range (ug/L)		Microcystin Regulation (ug/L)
Raw	26	<0.1	0.4	N/A
Treated	26	<0.1	<0.1	1.5

Water Production

Effluent Flow Data

In 2024 the Kenora WTP pumped a total of 2,219,993 cubic meters (m³) of water to the distribution system. The highest daily flow took place in May, with a total of 7,951 m³ being pumped on the 30th. This is 31% of the plants rated capacity of 25,270m³/d.

Month	Total Monthly Flow (m ³)	Average Daily Flow (m ³ /d)	Maximum Daily Flow (m ³ /d)
January	200,496	6,468	7,337
February	190,544	6,805	7,447
March	209,693	6,764	7,311
April	194,096	6,470	7,369
May	178,751	5,766	7,951
June	172,932	5,764	7,253
July	183,166	5,909	7,357
August	186,874	6,028	6,736
September	174,542	5,818	6,492
October	171,240	5,524	6,124
November	169,125	5,638	6,426
December	188,544	6,082	6,676

Influent Flow Data

In 2024 the Kenora WTP pumped a total of 2,271,086 m³ of raw water from Lake of the Woods. The highest daily flow took place in May, with a total of 8,329 m³ being pumped on the 30th. This is 32% of the plant's water taking limit of 26,000 m³/d as set out in the Permit to Take Water (PTTW). The highest instantaneous rate at which water was taken from Lake of the Woods was 22,588 m³/day, which occurred on June 26th. This is also 87% of the limit set out in the PTTW.

Month	Total Monthly Flow (m ³)	Average Daily Flow (m ³ /d)	Maximum Daily Flow (m ³ /d)
January	203,949	6,579	7,456
February	194,493	6,946	7,623
March	214,480	6,919	7,503
April	199,551	6,652	7,700
May	183,638	5,924	8,329
June	178,578	5,953	7,718
July	186,100	6,003	7,677
August	194,467	6,273	7,403
September	176,975	5,899	6,622
October	175,396	5,658	6,522
November	172,405	5,747	6,590
December	191,054	6,163	6,787

Historic Flow Data

Total effluent flow has remained relatively stable over the past 10 years. There is no expectation of significant greater demand on the system in the near future.

Year	Total Effluent Flow (m ³)	Average Daily Flow (m ³ /d)	Annual Change	2024 Comparison
2014	2,621,655	7,183	N/A	118%
2015	2,452,926	6,720	-6.4%	111%
2016	2,066,260	5,646	-15.8%	93%
2017	2,151,431	5,894	+4.1%	97%
2018	2,247,301	6,157	+4.5%	102%
2019	2,229,036	6,107	-0.8%	101%
2020	2,182,328	5,963	-2.1%	98%
2021	2,274,543	6,232	+4.2%	103%
2022	2,329,057	6,381	+2.4%	105%
2023	2,332,904	6,392	+0.2%	105%
2024	2,219,993	6,066	-5.4%	

Operational Compliance

An inspection was conducted by the Ministry of Environment Conservation and Parks (MECP) on April 30th and May 1st. The final inspection rating was 100.00%. One non-compliance was identified in the inspection report.

Non-Compliance – OIC identified were not always performing the functions of an OIC

Issue: Operators signing in as OIC's were not performing the functions of an OIC.

Corrective Actions Taken: An operator will only log in as an OIC in the logbook when performing OIC duties. June and July logbook entries were resubmitted for review and the corrections satisfied the Ministry. No further action is required.

More Information or Questions

This report is available free of charge to anyone who requests a copy. An electronic copy is available on the City of Kenora website, and anyone wanting to be provided a paper copy can make arrangements to pick one up from the Water Treatment Plant. Any inquiries or concerns or request for copies of this report can be directed to:

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