THE MUNICIPALITY OF

KINCARDINE

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Kincardine Drinking Water System

2024 Annual Water Summary Report

1. INTRODUCTION AND BACKGROUND

The municipality owns and operates drinking water systems to provide residents with safe, potable water. These municipal drinking water systems are regulated under various legislation and legal documents including the Safe Drinking Water Act and Ontario Regulation 170/03 Drinking Water Systems. O. Reg. 170 requires that the municipality complete an annual water report (Section 11) and an annual summary report (Schedule 22). The information required for each of these reports has been combined into this one report. This annual water summary report will be made available for inspection as per O. Reg. 170 subsection 12 (4).

The reports are available free of charge on the municipal website at www.kincardine.ca or by contacting the Environmental Services Department at waterservice@kincardine.ca. Requests will also be received in person or by telephone at the Municipal Administration Centre (1475 Concession 5, 519-396-3468) or the Environmental Services Office (155 Durham Street, Kincardine, 519-396-4660).

1.1. System Description

Drinking-Water System Number:	220002716
Drinking-Water System Name:	Kincardine Drinking Water System
Drinking-Water System Owner:	Municipality of Kincardine
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	Year 2024

The Kincardine Drinking Water System (DWS) takes water from Lake Huron and treats it using a surface water treatment plant. The water treatment plant provides conventional filtration and consists of two Actiflo clarifiers, four filters, a chlorination system, and an underground reservoir. The intake capacity is 18,750 m^3/d and the treatment plant rated capacity is 11,563 m^3/d. The chemicals used for treatment are Clar+ion A5, Norfloc 127H (formerly Magnafloc LT27AG), Actisand and chlorine gas. The distribution system serves the town of Kincardine and residents north of the town via a pipeline, plus the Huronville Subdivision Distribution System owned by the Township of Huron-Kinloss, with a total of over 4000 connections. There is a 3,360 m^3 standpipe to provide water storage, pressure, and fire protection for the distribution system. A Booster Chlorination Facility is located at the north end of the distribution system for the Inverhuron Provincial Park. In 2018, a Booster Station was commissioned for monitoring and increasing pressure and chlorination for lands to the north of Gary Street.

1.2. Major Expenses

The system incurred expenses necessary to install, repair or replace required equipment as follows:

Raw Water Line Expenses	$301,334
Treatment Equipment	$342,292
Monitoring Equipment	$49,028
KWTP Building Repairs	$88,988
Engineering for future upgrades	$2,396
Distribution Repairs and Upgrades	$1,196,919

2. WATER QUALITY MONITORING

Each municipal drinking water system is required to do testing to ensure that the water supplied to consumers is safe for consumption. Some of these tests such as chlorine residuals are done on site while others, like microbiological testing, must be performed by a licenced laboratory.

2.1. Microbiological Testing

O. Reg. 170 Schedule 10, requires the Kincardine DWS to take a minimum of one sample per week of raw, treated and distribution water with a minimum of eighteen distribution samples required every month. All raw, treated and distribution samples must be tested for Escherichia coli (E. coli) and total coliforms (TC). All the treated samples and twenty five percent of the distribution samples must also be tested for heterotrophic plate count (HPC). Our internal sampling schedule exceeds the minimum requirements by having operations staff collect one treated and six distribution samples every week and have them tested for E. coli, total coliform and HPC, with 1 raw sample taken each week tested for E. coli and total coliforms.

Any E. coli or total coliform results above zero (0) in treated or distribution water must be reported to the Ministry of Environment, Conservation and Parks (MECP) and the Medical Officer of Health (MOH).

Heterotrophic plate count is a colony count of general bacteria population. There is no adverse limit for HPC samples. Results over 500 colonies per 1 mL may indicate a change in water quality but it is not considered an indicator of unsafe water.

The results from the 2024 sampling program are shown in the Kincardine Water Source table. Samples taken in addition to our sampling program for things like watermain repairs or construction projects are not included here.

Kincardine Water Source	Number of Samples	Range of Total Coliform Results (#-#)	Range of E. coli Results (#-#)	Number of HPC Samples	Range of HPC Results (#-#)
Raw	53	0 – 1640	0 – 40	0	
Treated	53	0 – 0	0 – 0	53	0 – 10
Distribution	321	0 – 0	0 – 0	321	0 – 11

Notes: Raw water samples-3 samples in January and 1 sample in December indicated No Data Overgrown with Target Bacteria (NDOGT).

2.2. Chemical Testing

The Safe Drinking Water Act Reg 170 Schedule 13 requires periodic testing of the water for chemical parameters. The Kincardine DWS is required to test for nitrite/nitrate, trihalomethanes and haloacetic acids on a quarterly basis. The tables below outline these as well as other inorganic and organic parameters that are required to be tested for annually and include the date and result of the most recent test. Any result displayed as less than (<) are below the method detection limit of the licenced lab.

Sodium and fluoride are not found in significant levels in the treated water and fluoride is not added to the drinking water. Sodium and fluoride are only required to be tested for every five years and were tested in 2023.

If the concentration of a parameter is above half of the Maximum Acceptable Concentration (MAC) under the Ontario Drinking Water Quality Standards, an increased testing frequency of once every three months is required by O. Regulation 170. There were no parameters above the half MAC that were required to be tested for quarterly in 2024.

Inorganic Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	October 7/24	<0.6	µg/L	No
Arsenic	October 7/24	0.6	µg/L	No
Barium	October 7/24	14.0	µg/L	No
Boron	October 7/24	13	µg/L	No
Cadmium	October 7/24	0.003	µg/L	No
Chromium	October 7/24	0.21	µg/L	No
Mercury	October 7/24	<0.01	µg/L	No
Selenium	October 7/24	0.23	µg/L	No
Sodium	October 10/23	5.09	mg/L	No
Uranium	October 7/24	0.010	µg/L	No
Fluoride	October 10/23	0.06	mg/L	No
Nitrite	January 15/24 April 8/24 July 8/24 October 7/24	<0.003 <0.003 <0.003 <0.003	mg/L	No
Nitrate	January 15/24 April 8/24 July 8/24 October 7/24	1.30 0.3 0.324 0.250	mg/L	No

Organic Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	October 7/24	< 0.02	µg/L	No
Atrazine + N-dealkylated metabolites	October 7/24	0.03	µg/L	No
Azinphos-methyl	October 7/24	< 0.05	µg/L	No
Benzene	October 7/24	< 0.32	µg/L	No
Benzo(a)pyrene	October 7/24	< 0.004	µg/L	No
Bromoxynil	October 7/24	< 0.33	µg/L	No
Carbaryl	October 7/24	< 0.05	µg/L	No
Carbofuran	October 7/24	< 0.01	µg/L	No
Carbon Tetrachloride	October 7/24	< 0.17	µg/L	No
Chlorpyrifos	October 7/24	< 0.02	µg/L	No
Diazinon	October 7/24	< 0.02	µg/L	No
Dicamba	October 7/24	< 0.20	µg/L	No
1,2-Dichlorobenzene	October 7/24	< 0.41	µg/L	No
1,4-Dichlorobenzene	October 7/24	< 0.36	µg/L	No
1,2-Dichloroethane	October 7/24	< 0.35	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	October 7/24	< 0.33	µg/L	No
Dichloromethane	October 7/24	< 0.35	µg/L	No
2-4 Dichlorophenol	October 7/24	< 0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	October 7/24	< 0.19	µg/L	No
Diclofop-methyl	October 7/24	< 0.40	µg/L	No
Dimethoate	October 7/24	< 0.06	µg/L	No
Diquat	October 7/24	< 1	µg/L	No
Diuron	October 7/24	< 0.03	µg/L	No
Glyphosate	October 7/24	< 1	µg/L	No
Malathion	October 7/24	< 0.02	µg/L	No
2 methyl-4-chlorophenoxyacetic acid	October 7/24	<0.00012	µg/L	No
Metolachlor	October 7/24	<0.01	µg/L	No
Metribuzin	October 7/24	< 0.02	µg/L	No
Monochlorobenzene	October 7/24	< 0.3	µg/L	No
Paraquat	October 7/24	< 1	µg/L	No
Pentachlorophenol	October 7/24	< 0.15	µg/L	No
Phorate	October 7/24	< 0.01	µg/L	No
Picloram	October 7/24	< 1	µg/L	No
Polychlorinated Biphenyls (PCB)	October 7/24	< 0.04	µg/L	No
Prometryne	October 7/24	< 0.03	µg/L	No
Simazine	October 7/24	< 0.01	µg/L	No
Terbufos	October 7/24	< 0.01	µg/L	No
Tetrachloroethylene	October 7/24	< 0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	October 7/24	< 0.20	µg/L	No
Triallate	October 7/24	< 0.01	µg/L	No
Trichloroethylene	October 7/24	< 0.44	µg/L	No
2,4,6-Trichlorophenol	October 7/24	< 0.25	µg/L	No
Trifluralin	October 7/24	< 0.02	µg/L	No
Vinyl Chloride	October 7/24	< 0.17	µg/L	No

Trihalomethane (THM) distribution sampling is required quarterly and must also be expressed as a running annual average. The limit as set in the Ontario Drinking Water Quality Standards is 100 ug/L. Trihalomethanes are a by-product of the disinfection process.

Date Sampled	THM Result Value (µg/L)	Running Annual Average (µg/L)	Exceedance
January 15/24	31	25.3	No
April 8/24	26	27.5	No
July 8/24	17	26.0	No
October 7/24	23	24.3	No

Sampling and testing for haloacetic acids (HAA) in the distribution system was a new requirement as of 2017. The limit as set in the Ontario Drinking Water Quality Standards is 80 ug/L and starting in 2020 must also be expressed as a running annual average. Haloacetic acids are a by-product of the disinfection process.

Date Sampled	HAA Result Value (µg/L)	Running Annual Average (µg/L)	Exceedance
January 15/24	21.3	12.5	No
April 8/24	6.6	9.6	No
July 8/24	<5.3	9.6	No
October 7/24	<5.3	9.6	No

The Kincardine DWS does not have significant levels of lead and so is currently under a reduced-sampling program. Under this sampling program, O. Reg 170 Schedule 15.1 requires sampling for lead every three years and lead-related parameters (pH and alkalinity) every year. Lead PH and Alkalinity sampling was completed in 2024. Below are the results:

Date Sampled	Location Type	Number of Samples	Parameter	Range of Results
March 25, 2024	Distribution	4	Lead (ug/L)	0.14 – 0.84
			pH	6.2 – 6.6
			Alkalinity (mg/L)	60 – 75
August 12, 2024	Distribution	4	Lead (ug/L)	0.05 – 0.11
			pH	7.9 – 8.2
			Alkalinity (mg/L)	62 – 81

2.3. Operational Monitoring

The free chlorine residual must be monitored continuously on the treated water at the point of entry into the distribution system. A minimum of seven distribution grab samples are taken weekly and tested for free chlorine residual. In addition, free chlorine levels are monitored continuously within the treatment process and at three locations in the distribution system.

As a target, free chlorine residual within the distribution system should be above 0.20 mg/L. A free chlorine level lower than 0.05 mg/L must be reported to the Ministry of the Environment, Conservation and Parks Spills Action Centre and corrective action taken.

At the Kincardine Water Treatment Plant, turbidity is monitored continuously on the raw water, after each Actiflo unit, after each filter and at the point of entry into the distribution system. Turbidity is measured in nephelometric turbidity units (NTU).

Filter effluent turbidity is reported to the ministry's Spills Action Centre if it is greater than 1 NTU for a period of 15 minutes or more, or if there are two spikes above 1 NTU within a 15-minute period.

Treated Water at the Point of Entry into the Distribution System	**Number of Grab Samples**	**Range of Results (#-#)**
Turbidity	Continuous monitoring	0.09 – 2.00
Chlorine	Continuous monitoring	0.00 – 2.00

Note: Minimum Chlorine residuals of 0 are recorded during power interruptions and equipment maintenance.

1. True minimum cl2 (chlorine) residual for Point of Entry was 0.8mg/L
2. Feb 10-KWTP issue with water feed to reservoir discharge cl2 analyzer caused a false min cl2 residual of 0.68mg/L to be recorded
3. April 14-KWTP issue with water feed to reservoir discharge cl2 analyzer caused a false min cl2 residual of 0.69mg/L to be recorded
4. May 29-KWTP calibrations caused min residual of 0.66mg/L on reservoir discharge cl2 analyzer
5. Sept 23-KWTP receptacle changed for reservoir cl2 analyzer causing false min reading of 0mg/L
6. Dec 7-KWTP Reservoir Cl2 analyzer maintenance caused a min residual of 0mg/L

Distribution Water	Number of Grab Samples	Range of Results (#-#)
Free Chlorine Residual	366	0.93 – 1.88
Inverhuron Booster Station Free Chlorine Residual	Continuous Monitoring	0.00 – 2.00
Gary Street Booster Station Free Chlorine Residual	Continuous Monitoring	0.00 – 9.99
Kincardine Water Tower Free Chlorine Residual	Continuous Monitoring	0.00 – 2.00

Notes:

1. Minimum cl2 (chlorine) residuals of 0 are recorded during power interruptions and monthly generator testing.
2. April 17-Gary Booster Stn analyzer maintenance caused false min cl2 residual of 0mg/L and false max reading of 9.99mg/L
3. May 27 Gary Booster Stn Cl2 analyzer maintenance caused false min reading of 0.12mg/L and max reading of 9.99mg/L.
4. May 27-Kincardine Tower Cl2 analyzer cleaning caused min residual of 0.02mg/L
5. July 25-Gary Booster Stn Cl2 analyzer maintenance caused false min residual of 0mg/L and max reading of 9.99mg/L
6. July 23-Kincardine Tower Cl2 analyzer maintenance caused false cl2 residual of 0.06mg/L
7. Nov 4. Kincardine Tower Cl2 analyzer maintenance caused a min residual of 0.13mg/L
8. Dec 16-Inverhuron Booster Stn alarm testing/maintenance caused a min residual of 0mg/L to be recorded
9. Dec 18-Inverhuron Booster Stn alarm testing caused a min residual of 0.33mg/L to be recorded
10. Dec 17-Kincardine Tower Cl2 analyzer maintenance caused a min residual of 0mg/L to be recorded
11. Dec 18-Kincardine Tower maintenance stopped the flow of water to cl2 analyzer causing a false min residual of 0.13mg/L to be recorded

The Ministry of the Environment, Conservation and Parks *Procedure for Disinfection of Drinking Water in Ontario* requires that the turbidity on each filter effluent line is less than or equal to 0.3 NTU at least 95% of the time each month. All water directed to users met the filter effluent criteria below 1NTU.

Month	Filter #1	Filter #2	Filter #3	Filter #4
January	98.49%	96.75%	96.86%	97.51%
February	99.89%	99.96%	99.05%	99.86%
March	99.91%	99.88%	98.28%	99.73%
April	99.98%	99.98%	99.93%	100.00%
May	99.96%	100.00%	99.92%	100.00%
June	99.94%	99.98%	99.70%	99.98%
July	99.98%	100.00%	99.86%	99.98%
August	99.98%	100.00%	99.96%	100.00%
September	100.00%	100.00%	100.00%	99.98%
October	99.98%	99.98%	99.98%	99.95%
November	98.50%	99.27%	98.74%	97.85%
December	99.31%	98.98%	98.83%	97.66%

3. WATER QUANTITY

The following tables list the quantities and flow rates of the water supplied to the distribution system during the reporting period covered by this report, including monthly average and maximum daily flows, and a comparison to the rated capacity specified in the system Municipal Drinking Water Licence. The rated capacity is 11,563 m^3/day. There is no maximum flow rate specified for water supplied to the distribution system.

Month	Total Treated Flow (m3)	Average Daily Flow (m^3/day)	% Average Day Flow/ Rated Capacity	Maximum Daily Flow (m^3/day)	% Maximum Day Flow/ Rated Capacity
January	78,936	2,546	22%	3,135	27%
February	77,592	2,676	23%	3,099	27%
March	82,221	2,652	23%	3,165	27%
April	82,877	2,763	24%	3,574	31%
May	97,733	3,153	27%	3,657	32%
June	121,384	4,046	35%	5,750	50%
July	140,696	4,539	39%	5,593	48%
August	132,948	4,289	37%	5,115	44%
September	119,632	3,988	34%	4,936	43%
October	97,106	3,132	27%	3,863	33%
November	72,140	2,405	21%	3,130	27%
December	76,025	2,452	21%	3,227	28%
Annual	**1,179,289**	**3,220**	**28%**	**5,750**	**50%**

Month	Average Daily Flow Rate (L/s)	Maximum Daily Flow Rate (L/s)
January	153.33	160.58
February	153.62	162.09
March	153.80	160.82
April	154.12	300.00
May	154.60	169.50
June	155.25	167.27
July	134.35	166.43
August	51.07	164.10
September	47.46	167.29
October	37.29	162.53
November	28.66	163.41
December	29.22	162.39
Annual	**104.40**	**300.00**

Note: Starting July 25 Highlift average L/s includes 0's when pump is not running

4. ADVERSE WATER QUALITY INCIDENTS AND NON-COMPLIANCE FINDINGS

Any adverse results from microbiological samples, chemical samples or observations of operational conditions that indicate adverse water quality are reported to the Spills Action Centre (SAC) of the Ministry of the Environment, Conservation and Parks (MECP) and the Medical Officer of Health (MOH). All adverse conditions are responded to immediately and corrective actions taken.

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
December 27, 2024	Low distribution chlorine residual at hydrant WH2-8 on Riggin Cres	0.04mg/L of free chlorine	Flushed hydrant until residual was 0.64mg/L	December 27, 2024

An annual Ministry of the Environment, Conservation and Parks Inspection was completed on December 4, 2024. There were no non-compliance issues noted in the report.

O. Reg 170 Schedule 22 requires the municipality to identify any requirements of the Act, Regulations, Drinking Water Works Permit, Municipal Drinking Water Licence and any Order that the system failed to meet during the reporting period. There were four issues identified in 2024.

Drinking Water Legislation	Requirements the System Failed to Meet	Duration	Corrective Actions
MDWL 088-102 Section 10.1.2	An estimated amount of 200L of chlorinated water was reported as a spill from the distribution system direct to Lake Huron for approximately 95 minutes. Cl2 residual was 1.58mg/L	95 minutes May 21, 2024	Broken fitting repaired
MDWL 088-102 Schedule C section 4.0	Reservoir level transducer used for CT calculations was not calibrated at least once every 12 months. Identified in Internal DWQMS Audit on Sept 26.	No record of calibration on transducer	Had the reservoir level transducer calibrated by a third party on Oct 15; added transducer to the annual calibration listing
MDWL 088-102	An estimated amount of 371m3 of chlorinated water was reported as a spill from the KWTP direct to Lake Huron for approximately 1 hour and 48 minutes. Cl2 residual was 1.89mg/L	1 hour and 48 minutes on December 6, 2024	Backwash waste valve closed. Float levels in tank revised for alarms. Reviewed procedure for staff
Reg 170/03 Schedule 6 section 6-5 (1.1)	Win911 alarm system failure for KWTP	Dec 18 16:30 to Dec 19 at 0015	Scada contractor called to fix issue with Win911 app, backup alarm re-enabled