



Armow Drinking Water System

2025 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:	220008792
Drinking-Water System Name:	Armow Drinking Water System
Drinking-Water System Owner:	Municipality of Kincardine
Drinking-Water System Category:	Small Municipal Residential
Period being reported:	Year 2025

The Armow Drinking Water System (DWS) consists of one non-GUDI well (which means that it is a secure well and not under the influence of surface water).

Primary treatment is achieved through UV disinfection. The UV system consists of two (2) Trojan UV units, each capable of treating 0.63 L/s (10 gpm). Each UV unit is equipped with flow restrictors to ensure that the flow limit is not exceeded. If one UV unit is off-line, a sufficient volume of water can be treated by the second UV unit to meet the demands of the distribution system. If both UV units are unable to run, the well will be locked out. Upstream of each UV unit is a 50/5-micron cartridge filter.

Sodium hypochlorite (NSF certified) is used for secondary treatment but can also provide primary disinfection if the UV disinfection is unavailable.

In 2018, an arsenic-removal system was installed on-site to remove the naturally occurring arsenic.

An emergency back-up generator is capable of providing sufficient power to the entire Armow treatment system.

1.2. Major Expenses

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

Treatment Equipment \$ 28,299

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 11, requires the Armow DWS to take a minimum of one sample per month of raw water from the well, and one sample every two weeks of distribution water and have them tested for Escherichia coli (E. coli) and total coliforms (TC). 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 one distribution sample every week and have them tested for E. coli, total coliform and HPC. In October 2023 the raw water sampling was increased to weekly to monitor 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) Spills Action Centre (SAC) 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 2025 sampling program are shown in the table below.

Water Source	Number TC/EC of Samples	Range of Total Coliform Results (#-#)	Range of E.coli Results (#-#)	Number of HPC Samples	Range of HPC Results (#-#)
Raw	52	0 – 1	0 – 0	0	
Treated	52	0 – 0	0 – 0	52	0 – 10
Distribution	54	0 – 0	0 – 0	54	0 – 10

2.2. Chemical Testing

O. Reg 170 Schedule 13 requires periodic testing of the water for chemical parameters. The Armow DWS is required to test for nitrite/nitrate on a quarterly basis. Until recently, trihalomethanes and haloacetic acids were tested for quarterly but due to the low levels, they are now only required to be tested on a quarterly basis every third year. The tables below outline other inorganic and organic parameters that are required to be tested every five years 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 lab.

Sodium and fluoride levels exceed the Ontario Drinking Water Quality Standards, but they are naturally occurring in the groundwater and do not need to be tested more frequently than every five years. 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. Due to the naturally occurring arsenic in the ground water, the Armow DWS is equipped with an arsenic-removal system and is required to test the arsenic levels in the raw and treated water on a monthly basis. Arsenic in the raw water averaged 14.93 ug/L before treatment in 2025. Treated results are in the following table.

Inorganic Parameters	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	October 6/25	< 0.06	µg/L	No
Arsenic	January 13/25	0.2	µg/L	No
	February 10/25	<0.2		
	March 17/25	0.2		
	April 14/25	< 0.2		
	May 12/25	< 0.2		
	June 9/25	<0.2		
	July 14/25	< 0.2		
	August 11/25	< 0.2		
	September 8/25	0.2		
	October 14/25	0.2		
	November 10/25	< 0.2		
	December 8/25	<0.2		
Barium	October 6/25	23.3	µg/L	No
Boron	October 6/25	291	µg/L	No
Cadmium	October 6/25	0.006	µg/L	No
Chromium	October 6/25	<0.08	µg/L	No
Mercury	October 6/25	< 0.01	µg/L	No
Selenium	October 6/25	< 0.04	µg/L	No
Sodium	October 6/25	49.9	mg/L	Yes
	October 14/25	49.9		
Uranium	October 6/25	1.20	µg/L	No
Fluoride	October 6/25	2.05	mg/L	Yes
	October 8/25	2.11		
Nitrite	January 13/25	< 0.003	mg/L	No
	April 14/25	< 0.003		
	July 14/25	< 0.003		
	October 6/25	< 0.003		
Nitrate	January 13/25	0.007	mg/L	No
	April 14/25	<0.007		
	July 14/25	0.008		
	October 6/25	<0.006		

Organic Parameters	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	October 6/25	< 0.02	µg/L	No
Atrazine + N-dealkylated metabolites	October 6/25	< 0.01	µg/L	No
Azinphos-methyl	October 6/25	< 0.05	µg/L	No
Benzene	October 6/25	< 0.32	µg/L	No
Benzo(a)pyrene	October 6/25	< 0.004	µg/L	No
Bromoxynil	October 6/25	< 0.33	µg/L	No
Carbaryl	October 6/25	< 0.05	µg/L	No
Carbofuran	October 6/25	< 0.01	µg/L	No
Carbon Tetrachloride	October 6/25	< 0.17	µg/L	No
Chlorpyrifos	October 6/25	< 0.02	µg/L	No
Diazinon	October 6/25	< 0.02	µg/L	No
Dicamba	October 6/25	< 0.20	µg/L	No
1,2-Dichlorobenzene	October 6/25	< 0.41	µg/L	No
1,4-Dichlorobenzene	October 6/25	< 0.36	µg/L	No
1,2-Dichloroethane	October 6/25	< 0.35	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	October 6/25	< 0.33	µg/L	No
Dichloromethane	October 6/25	< 0.35	µg/L	No
2-4 Dichlorophenol	October 6/25	< 0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	October 6/25	< 0.19	µg/L	No
Diclofop-methyl	October 6/25	< 0.40	µg/L	No
Dimethoate	October 6/25	< 0.06	µg/L	No
Diquat	October 6/25	< 1	µg/L	No
Diuron	October 6/25	< 0.03	µg/L	No
Glyphosate	October 6/25	< 1	µg/L	No
Malathion	October 6/25	< 0.02	µg/L	No
2 methyl-4-chlorophenoxyacetic acid (MCPA)	October 6/25	<0.00012	µg/L	No
Metolachlor	October 6/25	< 0.01	µg/L	No
Metribuzin	October 6/25	< 0.02	µg/L	No
Monochlorobenzene	October 6/25	< 0.3	µg/L	No
Paraquat	October 6/25	< 1	µg/L	No
Pentachlorophenol	October 6/25	< 0.15	µg/L	No
Phorate	October 6/25	< 0.01	µg/L	No
Picloram	October 6/25	< 1	µg/L	No
Polychlorinated Biphenyls (PCB)	October 6/25	< 0.04	µg/L	No
Prometryne	October 6/25	< 0.03	µg/L	No
Simazine	October 6/25	< 0.01	µg/L	No
Terbufos	October 6/25	< 0.01	µg/L	No
Tetrachloroethylene	October 6/25	< 0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	October 6/25	< 0.20	µg/L	No
Triallate	October 6/25	< 0.01	µg/L	No
Trichloroethylene	October 6/25	< 0.44	µg/L	No
2,4,6-Trichlorophenol	October 6/25	< 0.25	µg/L	No
Trifluralin	October 6/25	< 0.02	µg/L	No
Vinyl Chloride	October 6/25	< 0.17	µg/L	No

Trihalomethane (THM) distribution sampling is required quarterly every third year and must also be expressed as a running annual average. The limit as set in the Ontario Drinking Water Quality Standards is 100 µg/L. Trihalomethanes are a by-product of the disinfection process. Below are the results of the 2025 THM sampling.

Date Sampled	THM Result Value (µg/L)	Running Annual Average (µg/L)	Exceedance
January 13/25	18	35	No
April 14/25	40	37	No
July 14/25	22	28	No
October 6/25	50	33	No

Sampling and testing for haloacetic acids (HAA) in the distribution system was a new requirement as of 2017. They are also required quarterly every third year as long as the results are below the limit. The limit as set in the Ontario Drinking Water Quality Standards is 80 µg/L and starting in 2020 must also be expressed as a running annual average. Haloacetic acids are a by-product of the disinfection process. Below are the most recent Haloacetic acids testing results. HAA testing was not required in 2025.

Date Sampled	HAA Result Value (µg/L)	Running Annual Average (µg/L)	Exceedance
January 9/23	< 5.3	6.7	No
April 11/23	< 5.3	5.7	No
July 10/23	6.5	6.0	No
October 10/23	< 5.3	5.6	No

The Armow 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. Only PH and Alkalinity was required to be sampled in 2025.

Date Sampled	Location Type	Number of Samples	Parameter	Results
March 24, 2025	Distribution	1	Lead (ug/L)	--
			pH	7.5
			Alkalinity (mg/L)	121
August 11, 2025	Distribution	1	Lead (ug/L)	--
			pH	7.9
			Alkalinity (mg/L)	129

2.3. Operational Monitoring

Ultraviolet (UV) light is used for primary disinfection of the raw water. A minimum UV dosage of 40 mJ/cm² must be maintained for adequate disinfection. The UV dosage is continuously monitored.

Sample Location	UV dosage (mJ/cm²) Range of Results (#-#)
UV Unit #1	0 – 837.1
UV Unit #2	0 – 475.2

UV Notes:

1. Zero (0) values were recorded during power flickers and monthly maintenance on the system.
2. June 10-Comm Center and EH unit lost power, 15 mins of data lost, reported to MECP
3. July 14-One issue with data blip below 40, not long enough to alarm out
4. Aug 30-One issue with data blip below 40, not long enough to alarm out
5. Aug 31-One issue with data blip below 40, not long enough to alarm out

Sodium hypochlorite is used for secondary disinfection. The free chlorine residual is monitored continuously on the treated water and a sample of distribution water is tested at least twice a week for free chlorine residual.

As a target, free chlorine residual within the distribution system should be above 0.20 mg/L. A distribution free chlorine level lower than 0.05 mg/L must be reported and corrective action taken.

Distribution Water	Number of Grab Samples	Range of Results (#-#)
Free Chlorine Residual	270	0.36 – 2.20

O. Reg 170 Schedule 7 requires that turbidity in the raw water is tested at least once every month. Consistent turbidity results greater than 5 NTU could indicate surface water influence on the well.

Raw Water Turbidity	Number of Grab Samples	Range of Results (#-#)
Armow Well	52	0.14 – 0.48

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 of the treatment system is 82 m³/day. There is no maximum flow rate specified for water supplied to the distribution system.

Month	Total Flow (m3)	Average Daily Flow (m ³ /day)	% Average Day/Rated Capacity (m ³ /day)	Maximum Daily Flow (m ³ /day)	% Maximum Day/Rated Capacity (m ³ /day)
January	238	8	9%	9	11%
February	247	9	11%	14	17%
March	214	7	8%	14	18%
April	113	4	5%	7	8%
May	127	4	5%	8	10%
June	206	7	8%	24	29%
July	183	6	7%	10	12%
August	164	5	6%	12	14%
September	132	4	5%	11	13%
October	113	4	4%	6	7%
November	101	3	4%	6	7%
December	103	3	4%	4	5%
Annual	1,942	5.3	7%	24	29%

Month	Average Daily Flow Rate (L/s)	Maximum Daily Flow Rate (L/s)
January	0.09	0.95
February	0.10	0.86
March	0.08	0.94
April	0.04	1.49
May	0.05	0.88
June	0.08	1.18
July	0.07	0.83
August	0.06	0.97
September	0.05	1.81
October	0.04	1.11
November	0.04	0.89
December	0.04	0.72
Annual	0.06	1.81

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. There were two reportable incidents in 2025 for Fluoride and Sodium which are both naturally occurring in the groundwater.

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
October 6, 2025	Fluoride *Naturally occurring in the groundwater	2.05mg/L	Resampled with the 2 nd result being 2.11mg/L	October 8, 2025
October 6, 2025	Sodium *Naturally occurring in the groundwater	49.9mg/L	Resampled with the 2 nd result being 49.9mg/L	October 14, 2025

The annual Ministry of the Environment, Conservation and Parks Inspection took place on November 6, 2025, and covered the period from July 20, 2024, to October 31, 2025. There were no non-compliances identified 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 two issues identified during the 2025 reporting period.

Drinking Water Legislation	Requirements the System Failed to Meet	Duration	Corrective Actions
Reg 170, Section 13	UV Comm Center and EH units both lost data on June 10, 2025 due to UPS unit getting wet (well was offline)	June 10, 2025 from 0916am to 0929am	An SOP for working on pressurized equipment was created
Reg 170 Schedule 6 section 5 (ii)	Phone line issue, No alarm system from July 14 to July 16, 2025 due to contractor work in shared building with treatment room.	July 14 (Unknown time) to July 16 at 0336pm	Data reviewed, all ok Staff reminded to check lights on dialers Email sent to operations to notify Water Plant if contractors are working onsite