

Annual Drinking Water Report 2025



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Questions or comments

Please contact us either by mail, phone or email.

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Introduction

All City of Peterborough drinking water facilities are managed under Environmental Services – Water Services Division. The Water Services Division includes the following operating departments:

- ◆ Water Treatment Plant
- ◆ Water Distribution
- ◆ Water Engineering Services

Drinking Water System

Source Water

The source of raw (untreated) water for Peterborough's drinking water is the Otonabee River. The Otonabee River water is of good quality and can be described as a moderately coloured water of low turbidity. The river water temperature ranges from 0°C (winter) to approximately 26°C (summer). The raw river water is what we call a surface water supply, which means that it is an unprotected source.

Accordingly, we assume that raw water always requires full treatment at the Peterborough Water Treatment Plant to make it drinkable or potable.

The river water quality is monitored by staff at the plant as well as the Otonabee Region Conservation Authority (ORCA) and the Peterborough Health Unit (beaches only). The watershed is protected by planning and approvals processes through the City of Peterborough and ORCA. Since 1998, ORCA has monitored water quality in the Otonabee watershed under the Watershed 2000 Program and the Provincial Water Quality Monitoring Network.

The City of Peterborough, Water Services continued its participation in the Source Water Protection Committee in 2024.

Treatment Plant Operations

The plant is located at 1230 Water Street North, Peterborough, adjacent to the Riverview Park & Zoo. The plant was initially built in 1922 and expanded in 1952, 1965, 1995 and 2016. The Conventional treatment process includes coagulation, flocculation, sedimentation, filtration and chlorine disinfection and a process waste treatment facility to dewater the backwash sludge. Total raw water processed in 2025 was 10,398.76 megalitres (ML), this is an average of 28.49 ML daily (Table 1). The daily average consumption increased from 2024. The maximum daily pumpage of 46.31 ML, which occurred on June 24, was a 14.18% increase from the maximum daily value (40.56 ML) recorded on September 17, 2024.

Table 1 Water Treatment Plant Operations

Water Treatment Plant Operations	2024	2025
Total Annual Raw Water m ³	11,437.72	10,398,762
Average Day ML	31.34	28.49
Total Annual Treated Water m ³	10,335,406	10,403,821
Average Day Consumption ML	28.23	28.49
Max. Daily Pumpage ML	39.30 – Sept. 17	43.54 – June 9
Max. Daily City Consumption ML	40.56 – Sept 17	46.31 – June 24
Peak Hourly Consumption Rate ML	82.64 – Jan 9 @ 08:30h	72.15 – June 9 @ 08:00h
Total Wash Water ML	179.80	188.55
Average of Plant Effluent	1.8%	1.8%
Total Zone #1 Pumpage ML	6,181.86	6,270.76
Average Day ML	16.89	17.18
Total Zone #2 Pumpage ML	4,153.55	4,133.07
Average Day ML	11.34	11.32

Reservoirs, Elevated Tanks, Water Booster Pumping Stations

Treated water is stored at various locations throughout the City in underground reservoirs and elevated storage tanks. Storage is used to supplement supply during times of high-water demand and in emergency situations such as firefighting. The water storage capacity in the system is 55.36 ML, including the Water Treatment Plant. Water storage around the city is as follows:

Table 2 Water Storage Capacity

Storage Location	Capacity
Water Treatment Plant	8.5 ML
High Street Elevated Tank	4.55 ML
Clonsilla Avenue Reservoir	18.18 ML
Towerhill Reservoir	22.73 ML
Sherbrooke Elevated Tank	2.3 ML
Milroy Elevated Tank	0.5 ML

Water Distribution

The water distribution system consists of approximately 472 kilometres of pipe (water mains), 2,471 hydrants and 27,818 individual water services. Hydrants are colour-coded according to the Ontario Fire Code requirements to indicate the available flow rate at a 20-psi residual pressure.

PTBO H2O

The mobile drinking water station, named PTBO H2O operated from May – October in 2024. This year PTBO H2O participated in municipally sponsored events, concerts, sporting events and local festivals. The mobile drinking water station was created to provide fresh clean tap water to event patrons. Visitors to the mobile station can use a fountain to have a drink or to refill water bottles while staff promotes our tap water and other conservation activities. The mobile unit compliments our corporate values on the Environment, with the promotion of resource conservation.

Peterborough Children's Water Festival



Despite the new Challenges, including the ice Storm damage at the Riverview Park & Zoo, the 2026 Peterborough Children's Water Festival on May 27 and 28th was very successful. This event is organized in collaboration with Green UP as well as educator, water quality specialist, conservation groups, industry and local government. This event provided students with experiential learning activities that are both educational and fun. The City of Peterborough is an original founder and provided funding as well as staff to ensure this event organized each year. Here are the following notable keys to success in 2026;

- ~1,400 youth in grades 2-5 attended from 31 local schools;
- 35+ hands-on activity centres connected youth to water conservation and protection;
- Cross-curricular activities tapped into science, social studies, math, and transferable language skills;
- ~150 high school students ran the activity centres in French and English, gaining valuable leadership skills;
- Over 50 community volunteers helped this free community event happen.

Major Expenses Summary

A summary of the major expenses incurred during the reporting period to install, repair, or replace required equipment, and the value of each is included in Table 3

Table 3 Capital Expenses

Description	Value
Annual Hydrant Painting and Flow Testing	\$103,286.00
Cement Mortar Lining	\$1,675,868.87
Chlorine Contact #2 and Clearwell #4 remediation and disinfection	\$167,000.00
Drinking Water Treatment Chemicals	\$625,000.00
Emergency Trunk main Repair in Air Release Chamber (Westbrook Dr. Trail)	\$97,920.51
Gas chlorination preventative maintenance	\$12,000.00
Infrastructure Locates	\$344,150.39
Laboratory and analyzer supplies	\$33,400.00
Replacement programmable logic controller cards for SCADA	\$20,000.00
Structural Lining	\$1,233,332.36
Water Meter Replacements	\$198,000.00
Water Service Repairs (65)	\$455,000.00
Water Street Dam Design & Rehabilitation	\$1,204,788.85
Watermain Break Repairs (27)	\$270,000.00

Water Main Replacement

Approximately 100 m of distribution water mains were replaced on:

- ◆ Crown Drive
- ◆ Queensway Court
- ◆ Erskine Ave

Water Service Replacement

A total of 2 water services were replaced in 2025.

Water Distribution Upgrades

Cleaning and lining of approximately 2.52 km of existing distribution water mains took place on:

- | | |
|--------------------|--------------------|
| ◆ Parkhill Road | ◆ Montague Court |
| ◆ Gilchrist Street | ◆ Lake Street |
| ◆ Edinburg Street | ◆ Rink Street |
| ◆ Union Street | ◆ Clonsilla Avenue |
| ◆ Bethune Street | ◆ Technology Drive |
| ◆ Dublin Street | ◆ The Queensway |
| ◆ Chambers Street | ◆ Queensway Court |



Summary of Inspection & Compliance

Ministry of Environment Conservation & Parks Inspection

During 2025, there was a Ministry of the Environment, Conservation & Parks (MECP) Inspection on October 25, 2025, report - 1-1425296355. The Peterborough Drinking Water System received a 100% compliance rating. There were no recommended best practices noted in the report.

Adverse Water Quality Incidents

There were no incidents of adverse drinking water quality test results in Peterborough for 2025.

Drinking Water Quality Management System

This Standard outlines requirements for a Quality Management System (QMS) to ensure high quality drinking water. In the development of a QMS, the Operating Authority must create an Operational Plan; this document will define the QMS and will be subject to external audits for accreditation. The Peterborough municipal water system received full scope accreditation in June 2011.

Accreditation Status

The Peterborough Drinking Water System maintained accreditation to the Drinking Water Quality Management Standard (DWQMS). In advance of the annual verification audit an internal audit was conducted in July 2025. The internal audit found six opportunities for improvement and that no corrective action was required. The external audit, conducted by NSF International, on August 11, 2025, described that the management system was well documented and continues to be effective.

Water Flows

Permit to Take Water

The Ontario Water Resources Act, Regulation 387/05 authorized Peterborough Utilities Commission in accordance with Permit to Take Water (PTTW), 023-CWCS6X the withdrawal of 190.68 ML per day. This PTTW was issued on October 29, 2023, and is valid for 10 years. Under this Regulation we are required to report the daily water taking annually by March 31st each year. In 2025, there were no instances of water taking more than this daily limit. The total volume of water pumped into the Water Treatment Plant was 11,567.25 megalitres (ML), this is an average of 31.70 ML daily.

Treated Water Production

The Water Treatment Plant produced 10,403.82 megalitres (ML) in 2025, this is an average of 28.49 ML daily (Chart 1). Historically the highest water consumption recorded was in 1980 (18,621.20 ML).

The City of Peterborough Water Services Division monitors water usage through water meters, most of the water usage in 2025 was by industrial, institutional and large commercial users (Chart 2 and Chart 3). There was a certain amount of water used for distribution system maintenance to maintain the water quality in the distribution system.

Treated Water Production

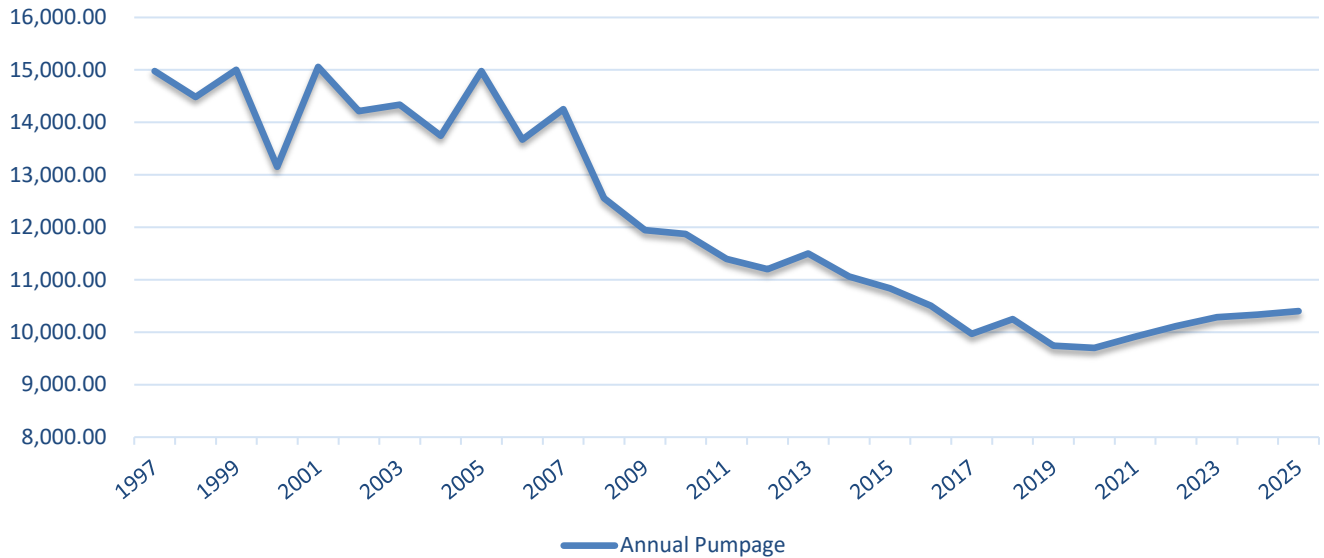


Chart 1 Treated Water Production

■ Treated water production was 10,403.82 ML in 2025

Monthly Residential Consumption m³

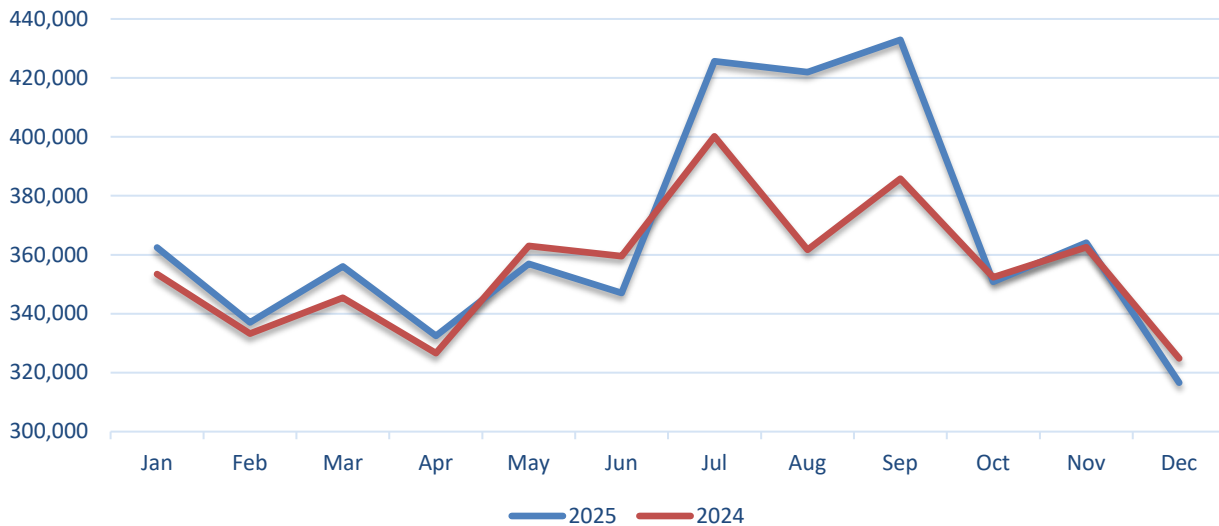


Chart 2 Monthly Residential Usage

The residential water consumption pattern is driven by annual weather patterns, as shown in Chart 2.

Commercial and Industrial Monthly Usage m³

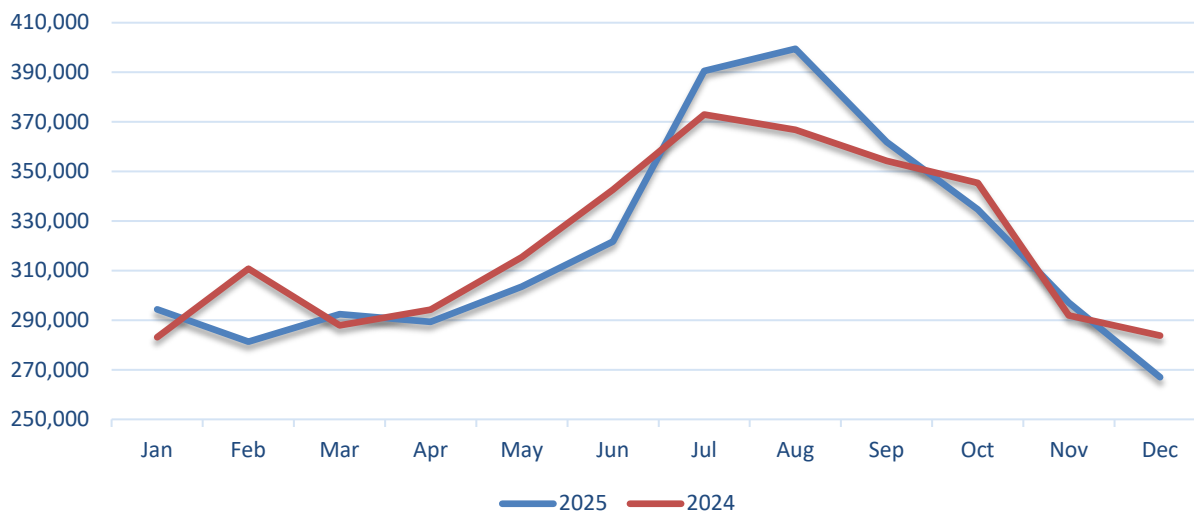


Chart 3 Commercial & Industrial Monthly Usage

The industrial water consumption typically peaks annually in the third quarter as shown in Chart 3.

Water Quality Results

Continuous monitoring of turbidity, chlorine, fluoride and pH levels happen at the Water Treatment Plant. Thousands of water samples are taken each year for chemical, physical and microbiological tests. These tests are carried out on water samples before and after treatment as well as on samples collected from different points in the water distribution system.

A total of approximately 20,000 individual tests were performed on Water Treatment Plant and water distribution samples in 2025. Approximately 13,000 individual tests were performed in the Water Treatment Plant Laboratory and approximately 6,000 microbiological and chemical tests were performed by Peterborough Environmental Protection Laboratory.



Results of the laboratory testing continue to confirm that the Peterborough Water Treatment Plant produces good quality water, and this quality is maintained throughout the water distribution system to the customer's tap.

O. Reg. 169/03 contains the Ontario Drinking Water Quality Standards (ODWQS). The purpose of the Province's ODWQS is to establish parameter limits to protect public health. An exceedance of any parameter would result in an adverse water quality event with notification to the Medical Officer of Health and the MECP. Appropriate corrective action would have to be initiated to

address the adverse incident.

Chlorine Residual

The Peterborough Water Treatment Plant uses chlorine for disinfection against viruses and bacteria in accordance with O. Reg. 170/03. Sample results reported under Schedule 7 for plant effluent was 1.05 – 2.47 mg/L.

Turbidity

The average raw water turbidity in 2025 was 0.49 NTU; average during 2024 was 0.58 NTU. The monthly raw water turbidity peak occurred in April at 0.81 NTU as shown in Chart 4, the past 20-year average raw water turbidity was 0.56 NTU and treated water turbidity was 0.09 NTU.

The zebra mussel population in the river could also be a contributing factor for the cyclical increases and decreases in raw water turbidity. Raw water turbidity has slowly dropped since 2008. The performance criteria for filtered water is 0.30 NTU for 95% of the time, without exceeding 1.0 NTU for more than fifteen minutes. The average filtered water turbidity was 0.04 NTU for 2025 and in 2024 it was 0.04 NTU. Filters are taken off-line when the turbidity reaches 0.15 NTU. The 2024 average treated water turbidity was measured at 0.05 NTU.

Average Monthly Turbidity 2025

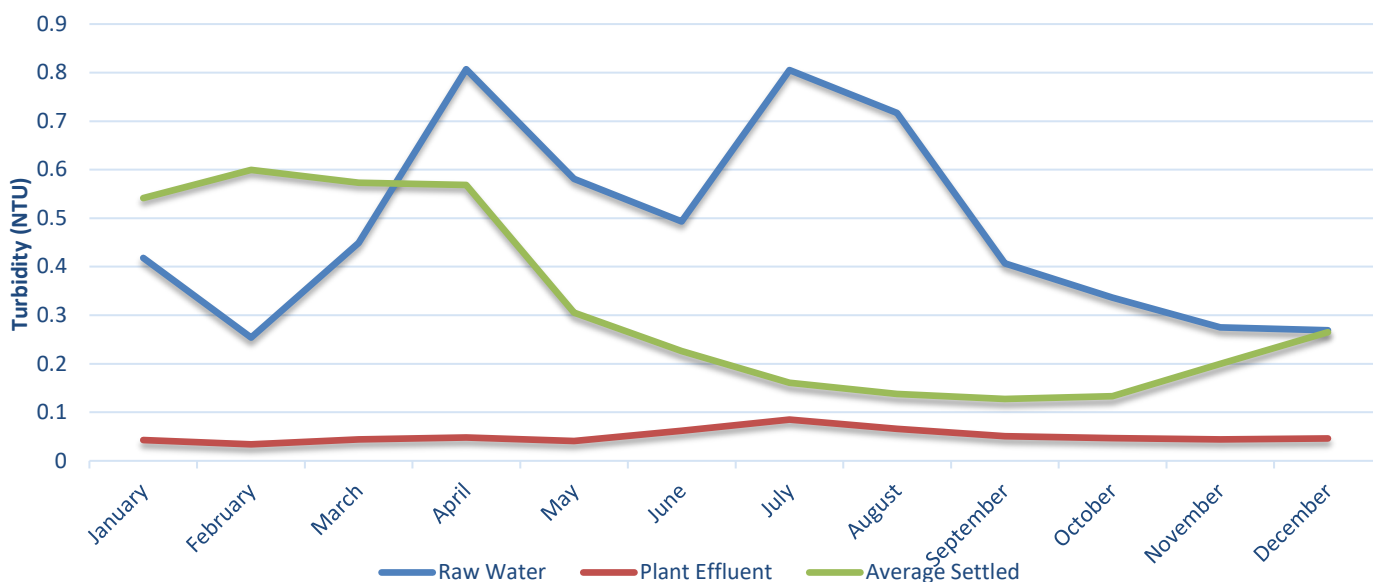


Chart 4 Monthly Turbidity

Microbiological Standards Testing

Escherichia coli

During 2025, a total of 243 Escherichia coli (E. coli) samples were analyzed from the Otonabee River (at the WTP intake) to assist in determining the source of fecal contamination within our source water. Monthly values ranged from 0 to 105 Colony Forming Units (CFU) per liter.

A total of 1,743 E. coli samples were analyzed from the plant effluent and distribution system. All values in the treated drinking water samples were zero.

Table 4 Inorganic Parameter Results

Parameter	MAC	Result Value	MAC Exceedance (Yes or No)	Parameter Description
Antimony (µg/L)	6	<0.06	No	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic (µg/L)	10	<0.02	No	Naturally occurring in surface waters / mine drainage
Barium (µg/L)	1000	25.7	No	Erosion of natural deposits. Discharge from metal refineries, oil drilling wastes.
Boron (/L)	5000	8	No	Erosion of natural deposits, industrial waste effluents.
Cadmium (µg/L)	5	<0.003	No	Industrial discharge
Chromium (µg/L)	50	0.12	No	Industrial residues
Mercury (µg/L)	1	<0.01	No	Erosion of natural deposits, industrial discharges.
Selenium (µg/L)	50	0.04	No	Discharge from refineries, mines, chemical manufacture
Uranium (µg/L)	20	0.024	No	Erosion of natural deposits.

Total Coliform

The MECP regulation for Total Coliform are to have all samples collected from the plant effluent to be zero CFU per litre of water sampled. During 2025, a total of 243 samples were analyzed from the Otonabee River. Monthly values ranged from 7 to 1540 Colony Forming Units (CFU) per liter. A total of 1,380 Total Coliforms samples were analyzed from the plant effluent and distribution system. All values in the treated drinking water samples were zero.

Inorganic Parameters

No known health-related water quality guidelines for inorganic (Table 4) and organic (Table 5) parameters were exceeded in 2025 in Peterborough's drinking water. To ensure that Peterborough's water is safe to drink, water quality is carefully monitored and subject to constant surveillance.

Organic Parameters

Table 5 Organic Parameter Results

Parameter	MAC	Result Value	MAC Exceedance (Yes or No)	Parameter Description
Alachlor (µg/L)	5	0.02<MDL	No	Agricultural herbicide
Atrazine + N-dealkylated metabolites (µg/L)	5	0.01<MDL	No	Agricultural herbicide
Azinphos-methyl (µg/L)	20	0.05<MDL	No	Insecticide
Benzene (µg/L)	1	0.32<MDL	No	Discharge from plastics manufacturing, leaking fuel tanks
Benzo(a)pyrene (µg/L)	0.01	0.004<MDL	No	Formed from the incomplete burning of organic matter.
Bromoxynil (µg/L)	5	0.33<MDL	No	Agricultural herbicide
Carbaryl (µg/L)	90	0.05<MDL	No	Agricultural/Forestry/ Household insecticide
Carbofuran (µg/L)	90	0.01<MDL	No	Agricultural insecticide
Carbon Tetrachloride (µg/L)	2	0.17<MDL	No	Discharge from chemical and industrial activities
Chlorpyrifos (µg/L)	90	0.02<MDL	No	Agricultural/ Household insecticide
Diazinon (µg/L)	20	0.02<MDL	No	Agricultural/ Livestock Operation/ Residential insecticide
Dicamba (µg/L)	120	0.20<MDL	No	Agricultural herbicide
1,2-Dichlorobenzene (µg/L)	200	0.41<MDL	No	Discharge from industrial chemical factories
1,4-Dichlorobenzene (µg/L)	5	0.36<MDL	No	Discharge from industrial chemical factories
1,2-Dichloroethane (µg/L)	5	0.35<MDL	No	Discharge from industrial chemical factories
1,1-Dichloroethylene (vinylidene chloride) (µg/L)	14	0.33<MDL	No	Discharge from industrial chemical factories
Dichloromethane (µg/L)	50	0.35<MDL	No	Discharge from pharmaceutical and chemical factories
2,4 Dichlorophenol (µg/L)	900	0.15<MDL	No	Industrial contamination/ reaction with chlorine
2,4-Dichlorophenoxy acetic acid (2,4-D) (µg/L)	100	0.19<MDL	No	Agricultural/ Residential herbicide
Diclofop-methyl (µg/L)	9	0.40<MDL	No	Agricultural herbicide
Dimethoate (µg/L)	20	0.06<MDL	No	Agricultural/ Livestock Operation/ Forestry insecticide
Diquat (µg/L)	70	1<MDL	No	Agricultural/ Aquatic herbicide
Diuron (µg/L)	150	0.03<MDL	No	Agricultural/ Industrial/ herbicide
Glyphosate (µg/L)	280	1<MDL	No	Agricultural/Forestry/ Household herbicide
Malathion (µg/L)	190	0.02<MDL	No	Fruit & Vegetable / pest control insecticide
2-Methyl-4-chlorophenoxyacetic acid (MCPA) (mg/L)	0.1	0.00012 <MDL	No	Leaching and/or runoff from agricultural and other uses

Parameter	MAC	Result Value	MAC Exceedance (Yes or No)	Parameter Description
Metolachlor (µg/L)	50	0.01<MDL	No	Agricultural herbicide
Metribuzin (µg/L)	80	0.02<MDL	No	Agricultural herbicide
Monochlorobenzene (µg/L)	80	0.3<MDL	No	Discharge from industrial and agricultural chemical factories and dry-cleaning facilities
Paraquat (µg/L)	10	1<MDL	No	Agricultural/ Aquatic herbicide
Pentachlorophenol (µg/L)	60	0.15<MDL	No	Pesticide/ wood preservative residue
Phorate (µg/L)	2	0.01<MDL	No	Agricultural insecticide
Picloram (µg/L)	190	1<MDL	No	Industrial herbicide
Polychlorinated Biphenyls (PCB) (µg/L)	3	0.04<MDL	No	Residue from various industrial uses
Prometryne (µg/L)	1	0.03<MDL	No	Agricultural herbicide
Simazine (µg/L)	10	0.01<MDL	No	Agricultural herbicide or its residue
Terbufos (µg/L)	1	0.01<MDL	No	Agricultural insecticide
Tetrachloroethylene (µg/L)	10	0.35<MDL	No	Leaching from PVC pipes; discharge from factories, dry cleaners and auto shops (metal degreaser)
2,3,4,6-Tetrachlorophenol (µg/L)	100	0.20<MDL	No	Wood preservative
Triallate (µg/L)	230	0.01<MDL	No	Agricultural herbicide
Trichloroethylene (µg/L)	5	0.44<MDL	No	Discharge from metal degreasing sites and other factories
2,4,6-Trichlorophenol (µg/L)	5	0.25<MDL	No	Pesticide manufacturing
Trifluralin (µg/L)	45	0.02<MDL	No	Agricultural herbicide
Vinyl Chloride (µg/L)	1	0.17<MDL	No	Leaching from PVC pipes; discharge from plastics factories

Trihalomethanes - THM

In Ontario, the Ministry of the Environment Conservation & Parks' Maximum Acceptable Concentrations (MAC) for total THM's (total concentration of chloroform, bromodichloromethane and dibromochloromethane) are set to 100 µg/L (running annual average) for the distribution system. According to O. Reg. 170/03, distribution THM samples must be collected and analyzed quarterly.

Trihalomethanes (THM's) are formed as a by-product when chlorine is used to disinfect water for drinking. The presence of organic materials along with the use of chlorine in the water treatment process can contribute to the formation of disinfection by-products. The THM's may have adverse health effects at high concentrations, and many governments set limits on the amount permissible in drinking water. The THM average values found leaving the Water Treatment Plant during 2025 was 36.0 µg/L. The past 10-year average plant effluent has been 39 µg/L.

Distribution levels are always found to be higher than those leaving the Water Treatment Plant since THM's continue to form as the water travels through the distribution piping system. During 2025, one distribution location was selected to assist in determining areas of the city where THM's may be highest. The annual average THM value in the distribution system was 76 µg/L (Chart 5), compared to the average THM of 85µg/L in 2024. The 10-year average of distribution

THM concentration was found to be 76 µg/L. The regulatory limit for distribution samples is 100 µg/L (running annual average); therefore, the Peterborough Drinking Water System maintained compliance.

2025 Total Trihalomethanes

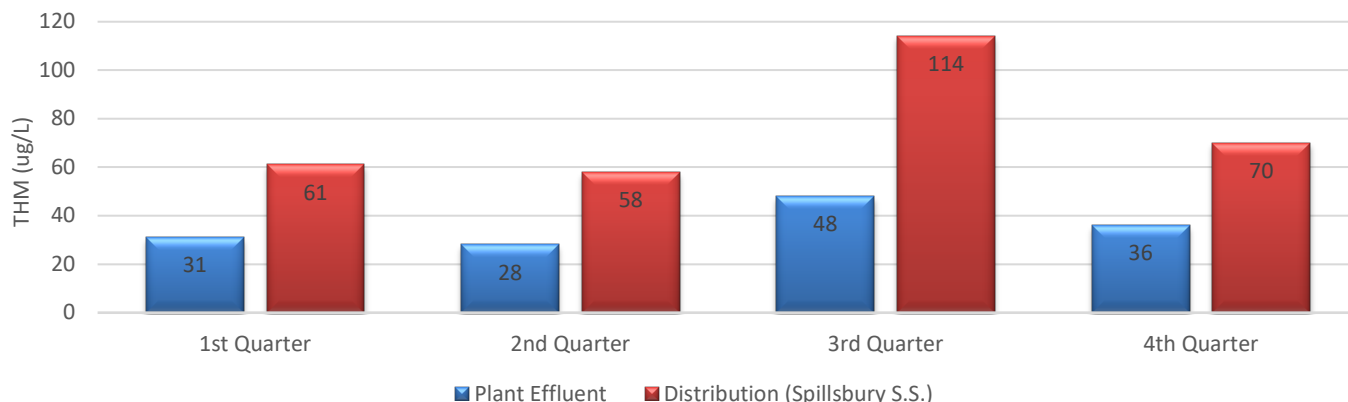


Chart 5 Trihalomethanes

Haloacetic Acid

HAA's are another group of chemicals that are formed as disinfection by-products like trihalomethanes (THM). The 2025 average treated water HAA was 27.4 µg/L and the average distribution sample was found to be 49.6 µg/L. O Reg. 170/03 was amended to include HAAs in 2021. The regulatory limit for distribution samples is 80 µg/L (running annual average); therefore, the Peterborough Drinking Water System maintained compliance.

Sodium

Sodium is not part of Schedule 23 or 24 but is required to be tested at least once every five (5) years. It has been sampled every year and was found to be below the ODWS aesthetic objective of 200 mg/L. In 2025, the sodium result was found to be 9.9 mg/L (8.8 mg/L in 2024). The local Medical Officer of Health must be notified when the sodium concentration exceeds 20 mg/L so that this information may be passed on to local physicians.

Lead

Lead sampling is required under O. Reg. 170/03, schedule 15.1. Peterborough requires 8 distribution samples to be collected and analyzed for lead, pH, and alkalinity every sampling period within the distribution. Peterborough is required to sample any residential house in the city that requests sampling for the same parameters mentioned above.

In 2025, 17 distribution points were sampled for lead. Customers are offered free testing of their private dwelling. The distribution sample results were less than 0.0005 to 0.0005 mg/L which indicates that the distribution system does not contribute to lead contamination.

Taste and Odour

The primary source of taste and odour in our raw water was from the naturally occurring compounds geosmin (name derived from the Greek 'earth' and 'smell') and 2-MIB (2- methylisoborneol). These compounds are monitored as a precursor to taste and odour complaints (earthy/musty) of the water and are not a health concern. They can be detected by humans at very low levels (less than 10 ng/L). The bacteria actinomycetes, zebra mussels and some species of algae can produce geosmin and 2-MIB, though all the contributing organisms are not known. Observations have shown that when we have greater zebra mussel and/or algae populations we experience higher amounts of geosmin and 2-MIB.



Previous annual data indicates that geosmin and 2-MIB would hit peaks at the same time during the summer months. There is usually a large peak near the end of the summer when the water temperature is highest, and sunlight hours are high. The concentration peaks for both taste and odour causing compounds occurred approximately July to November.

Geosmin is thought to originate higher in the water column and produce an earthy odour. The average raw water value during 2025 was 6.3 ng/L and the average plant treated water was 5.5 ng/L (Chart 6). The 2-MIB is produced in the sediment or benthic layer and gives off a musty odour. 2-MIB can reproduce well when sunlight can penetrate down to the bottom of lakes and streams. The average raw water value during 2025 was 4.5 ng/L and the average plant effluent was 4.6 ng/L (Chart 7). The reduction of geosmin and 2-MIB due to water treatment processes (coagulation, sedimentation, filtration, and chlorination) was negligible. Both geosmin and 2-MIB compounds resist oxidation (disinfection) and are difficult to remove by conventional water treatment processes.

2025 Average Monthly Geosmin

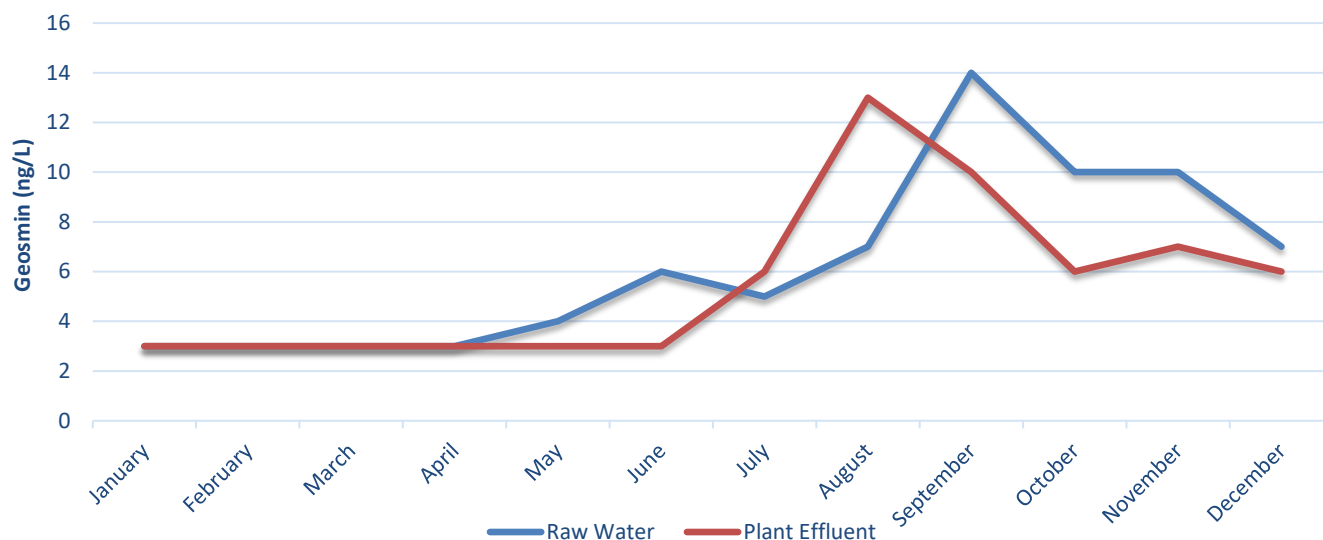


Chart 6 Geosmin

2025 Average Monthly 2-Methylisoborneol (2-MIB)

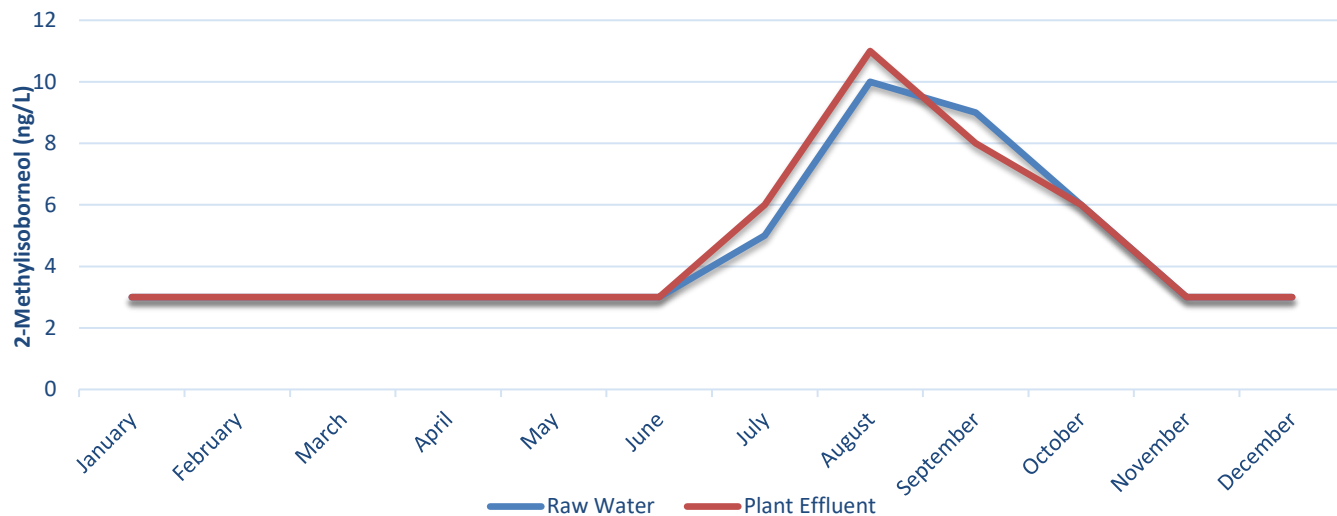


Chart 7 2-Methylisoborneol (2-MIB)

Regulatory Reporting

Summary Report

The Summary Report for Municipalities is required under Schedule 22 of O. Reg.170/03 of the Safe Drinking Water Act. The purpose of this Report is to provide information to the Owners of the drinking water system so that they may assess the capability of the system to meet the existing and planned uses. The summary of water delivered to Council through Report MOWAT26-002.

Table 6 Summary Report Results

Month	Average Day (M ³ /d)	Maximum Day (M ³ /d)	Peak Flows (L/m)
January	26,975	28,956	20,108
February	26,919	30,132	20,925
March	26,009	30,709	21,326
April	25,888	28,166	19,560
May	27,287	30,247	21,005
June	31,788	46,310	32,160
July	35,144	38,627	26,824
August	33,148	37,675	26,163
September	29,308	33,211	23,063
October	27,039	30,052	20,869
November	26,569	30,495	21,177
December	25,800	31,010	21,535
Rated Capacity	----	104,000	----
Maximum Taken per day (Permit to Take Water 0232-CWCSS6X)	----	190,680	132,743 L/m

Chemical Consumption

Table 7 Chemical Consumption

Chemical	2024	2025
Total Chlorine	40,302 kg	40,175 kg
Average Dosage	1.20 mg/L	1.20 mg/L
Total Aluminum Sulphate	856,463 L	897,743 L
Average Dosage	48.8 mg/L	50.6 mg/L
Total Hydrofluosilic Acid	29,668 L	29,184 L
Average Dosage	0.69 mg/L	0.71 mg/L
Total Sodium Hydroxide	72,570	69,645
Average Dosage	5.3 mg/L	5.2 mg/L

Chlorine Dosage

The average dose of chlorine for 2025 was 1.20 mg/L (Table 7). This value fluctuates throughout the year as higher doses of primary chlorine are required during the summer months because it takes more chlorine to disinfect the water when the water is warmer.

Chlorine is also added into the treated water before it leaves the WTP. This secondary chlorine is added to help maintain the chlorine residual throughout the distribution system to comply with the Ontario Drinking Water Standards (ODWS). Zebra mussel control for the Water Treatment Plant included adding approximately 0.5 mg/L of chlorine into the Water Treatment Plant intakes.

Hydrofluorosilicic Acid (fluoride)

Hydrofluorosilicic acid (fluoride) was added to the treated water to attain a combined concentration (target value) of 0.70 mg/L. Fluoride is added to the water depending on the total concentration required in the treated water and the concentration of the raw water. The average dosage of fluoride added to the water in 2025 was approximately 0.71 mg/L (Table 7). The average treated water fluoride residual was 0.62 mg/L. The average fluoride concentration found in the raw water (natural fluoride) during 2025 was 0.14 mg/L.



Sodium Hydroxide

Sodium Hydroxide (NaOH) is normally added to the plant effluent for corrosion control within the distribution system as well as plant effluent pH adjustment. The use of chlorine and aluminium sulphate (alum) during the water treatment process lowers the pH level causing the water to be slightly acidic (corrosive). The addition of NaOH increases the pH to a more acceptable value of 7.1

Aluminium Sulphate

Aluminium Sulphate (alum) is used as our primary coagulant causing particles (silt, sand, algae, and bacteria) to coagulate or 'clump' to form a floc, which can settle in the sedimentation basins. The water is further treated by filtration. Alum was added to the water during 2025 at an average rate of 50.6 mg/L (Table 7). Aluminium residual found in the WTP treated water can be a by-product of the addition of alum. The average treated water aluminium residual for 2025 was 0.045 mg/L and the operational guideline for aluminium is 0.1 mg/L.

Water Treatment Plant

Annual maintenance was conducted at the Water Treatment Plant, Water Street Pumphouse, reservoirs, elevated tanks, and booster pumping stations.

Water Distribution

Annual water distribution review and maintenance programs are necessary to ensure the safe delivery of drinking water in Peterborough. These programs include:

- ◆ Valve maintenance
- ◆ Hydrant maintenance
- ◆ Dead end flushing
- ◆ Service post repairs

Impact of Climate Events**March Ice Storm**

Between March 28 and March 30, Peterborough was hit by a major ice storm that brought up to 25 mm of freezing rain over a 30-hour period, leading to widespread hazardous conditions and localized power outages. This Ice Storm had minimal impact on the Water Services Division and no impact on the provision of drinking water.

Weather

The temperature during June, July and August averaged approximately 25.7°C. This is above normal summertime temperature, as well as an increase from 25.5 °C recorded in 2023. Environment Canada data describes the average normal value of 18.3°C (normal data 1981 – 2010). The summer saw a significantly higher frequency of extreme temperatures compared to typical historical averages, featuring 20 days exceeding 30°C. The 2025 summer rainfall in Peterborough was significantly drier than the region's historical climate norms. June through August of 2025 were particularly parched, recording 114.3 mm of rainfall, this is well below historical average of 264 mm typically seen. These very dry conditions triggered a Level 1 Low Water Advisory by Otonabee Conservation Authority in early August that would be elevated to a Level 2 Low Water advisory by late August. Rain fall in the Fall would finally allow the drought advisory to be lifted in December.

Water & Wastewater Operator Appreciation Day

On October 23, 2025 the City of Peterborough joins communities across Ontario in acknowledging the skill, diligence, and resilience of these frontline operators for Water and Wastewater Operator Appreciation Day! We're proud to recognize the dedicated professionals who ensure our community has access to clean, safe drinking water and reliable wastewater treatment every day.



Pilot Plant

The Peterborough Water Treatment Plant (WTP), has completed pilot-scale studies to optimize production, improve water quality, and investigate next-generation treatment technologies for the citizens of Peterborough. A 5000:1 scale-model version of the main treatment facility, the pilot plant includes processes such as coagulation, tapered mixing, flocculation, settling and filtration. In addition to conventional water treatment studies, ozone and advanced oxidation applications have been investigated.

Granular Activated Carbon Post-Filtration Study

During 2025, pilot-scale research objectives remained focused on the reduction of disinfection by-products (DBPs) and geosmin (GSM) and 2-methylisoborneol (2-MIB) compounds, in an effort to improve water quality and aesthetics for the consumer. Our current study is examining the impact of granular activated carbon (GAC) media and biofiltration as an additional treatment barrier following conventional dual-media filtration (DMF).



During the treatment process, dual media filtration; consisting of GAC/antracite and sand; plays a pivotal role in reducing organic and inorganic constituents and turbidity prior to disinfection. The implementation of a secondary filtration system using GAC was examined to determine the effectiveness at removing organic precursors to DBPs, reduction of chlorine demand, and impact on GSM and 2-MIB compounds. The GAC post-filtration study also looked at operational impacts, including filter loading rates, loss-of-head (LOH), and impact on

both chemical and energy requirements during treatment. Water quality studies examined impact on total organic carbon (TOC), natural organic matter (NOM), pH, and turbidity.

During the study, the GAC contactor resulted in decreased NOM and organic carbon. Total organic carbon was decreased 15% from 2.95 to 2.52 mg/L, corresponding to a specific ultraviolet absorbance (SUVA) reduction from 1.22 L/mg*m to 1.09 L/mg*m. The decrease in SUVA indicates a reduction of both hydrophobic and large molecular weight organic compounds that contribute to DBP formation during disinfection. Geosmin and 2-MIB compounds were reduced from 9.0 and 8.3 ng/L, respectively, to less than detectable (<3 ng/L). The threshold for GSM and 2-MIB detection by the consumer, and reported as a taste-and-odour issue, is 7 ng/L. The reduction of GSM and 2-MIB would eliminate the 'earthy-musty' taste and odour contributing compounds, that are released as algae decomposition occurs in late summer and early fall.

The decrease in organics also resulted in the reduction of regulated DBP compounds, trihalomethanes (THMs) and haloacetic acids (HAAs). THMs were reduced from 85 to 63 µg/L, resulting in a 25% reduction. HAAs were reduced from 57 to 38 µg/L, corresponding to a 35% reduction. The amelioration of DBPs is a direct result of improved water quality, through a reduction in organics, and the bio-stability of distribution water through removal of biologically degradable organic carbon (BDOC) and assimilable organic carbon (AOC). Further studies are required to determine if organic carbon removal during treatment is due to adsorption, biological filtration, or a combination of both mechanisms.

During the pilot studies, GAC contactor filter backwash rates were completed once per month; in contrast to the 72 to 96-hour backwash cycle required for conventional dual-media filters. The extended filter run times decreases operational energy and chemical use requirements for filter operation. Reduction in backwash cycle will also serve to proliferate biological filter performance, allowing filters to remain biologically active for an extended period of time to further exacerbate organic carbon removal. Elevated pH and reduced filter water turbidity could also reduce post-filtration chemical demand for corrosion control and disinfection. Chlorine demand following simulated distribution studies over 48-hours, showed a 30% increase in free chlorine residual following the GAC contactor when compared to conventional filtration alone. More stable chlorine residuals in the distribution could potentially reduce flushing requirements during warmer summer periods, reduce chemical and energy use, and provide enhanced water quality in the distal regions of the distribution system.

The GAC contactor may also serve as an effective barrier for contaminants of emerging concern, including microplastics, cyanotoxins from blue-green algae, and persistent 'forever-chemicals' including polyfluoroalkyl substances (PFAS). This would provide operational staff with another important treatment barrier in providing safe and clean drinking water to the City of Peterborough.

Further study is required to determine the impact of GAC contactor as a year-round or seasonal barrier, to determine if it will still provide the same treatment efficacy under cold water conditions. Generally, physical adsorption sites are effective for contaminant removal year-round, while biological filtration requires warmer water conditions in order to proliferate. The integration of a GAC contactor into the treatment process and infrastructure requirements for underdrain systems and air scour require further examination prior to implementation. The empty-bed contact time (EBCT), filter depth, and filter loading rate also require optimization to ensure that the GAC contactor will have an extended operational life.

Customer Service

Customer concerns relating to water are tracked by WTP staff and logged using computer software. Some questions and concerns that were asked to our WTP staff were related to taste and odour, colour, hardness, general water quality, information on water treatment, sampling, operations, and questions to assist with school projects on water treatment.

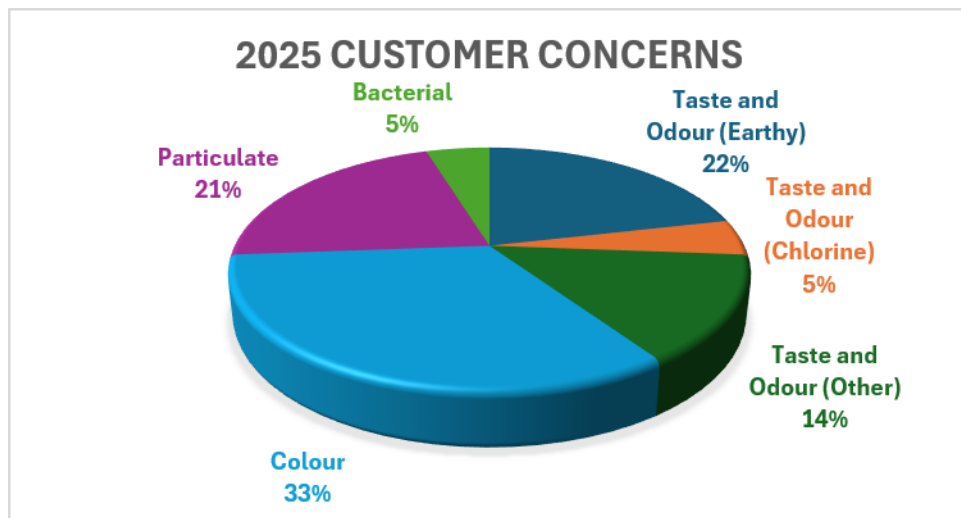


Chart 8 Customer Concerns

In 2025, staff responded to a total of 42 inquiries, compared to 18 in 2024. The 42 inquiries were related to the following concerns: 33% of customer calls were relating to colour (usually rusty coloured water), 21% were relating to particulate matter, a total of 41% relating to taste and odour, and 5% relating to bacteriological concerns. A further breakdown of the 17 taste and odour complaints revealed the following: 9 concerns were for an earthy musty odour, 2 concerns were for a chlorine taste and odour, and 6 concerns were for various other taste and odours, from metallic to medicinal.

Tours

Tours have been an important part of public education at the Peterborough Water Treatment Plant. In 2025 a total of 203 people toured the Water Treatment Plant.

Appendix B – Abbreviations

Abbreviation	Full Description
2-MIB	2-methlisoborneol
CFU	Colony Forming Unit
COD	Chemical Oxidization Demand
CTS	Calcium Thiosulphate
DBP	Disinfection by-product
DWQMS	Drinking Water Quality Standard
DWRG	Drinking Water Research Group
EDC	Endocrine disrupting compounds
HAA	Haloacetic Acid
KM	Kilometers
L/m	Litres per Minute
m ²	Square Meters
m ³	Cubic Meters
MAC	Maximum Acceptable Concentration
mg/L	Milligram per Litre
ML	Megalitres
MECP	Ministry of Environment & Climate Change
MOH	Medical Officer of Health
ng/L	Nanogram per Litre
NTU	Nephelometric Turbidity Unit
ODWQS	Ontario Drinking Water Quality Standards
ORCA	Otonabee Region Conservation Authority
ORP	Oxidative Reduction Potential
PACL	Polyaluminum Hydroxychloride
THM	Trihalomethane
TOC	Total Organic Carbon
µg/L	Microgram per Litre
UVA	Ultraviolet Absorbance
WTP	Water Treatment Plant