



# Annual Drinking Water Report 2021





# 2021 Annual Drinking Water Report

---

## Inside this Report

2021 PETERBOROUGH UTILITIES COMMISSION.....	1
2021 RIVERVIEW PARK AND ZOO ADVISORY COMMITTEE .....	1
INTRODUCTION.....	2
DRINKING WATER PROCESS DESCRIPTION.....	2
Source Water	2
TREATMENT PLANT OPERATIONS .....	2
Reservoirs, Elevated Tanks, Water Booster Pumping Stations	3
WATER DISTRIBUTION.....	3
PTBO H <sub>2</sub> O	4
CAPITAL WORKS SUMMARY .....	4
High Street Tank	4
Water Main Replacement	4
New Water Main Installation	4
Water Service Replacement	4
Water Main Rehabilitation	4
SUMMARY OF INSPECTION & COMPLIANCE .....	5
Ministry of Environment Conservation & Parks Inspection	5
Adverse Water Quality Incidents	5
Drinking Water Quality Management System	5
WATER FLOWS.....	5
Permit to Take Water	5
Treated Water Production	6
WATER QUALITY RESULTS .....	7
Chlorine Residual	7
Turbidity	7
Escherichia coli	9
INORGANIC PARAMETERS .....	9
ORGANIC PARAMETERS.....	9
Trihalomethanes -THM	11
Haloacetic Acid	12
Sodium	12
Lead	12

---

---

Taste and Odour	12
SUMMARY REPORT .....	14
CHEMICAL CONSUMPTION.....	14
Chlorine	15
Hydrofluorosilicic Acid (fluoride)	15
Sodium Hydroxide	15
Aluminium Sulphate	15
Water Treatment Plant	16
Water Distribution	16
IMPACT OF CLIMATE EVENT .....	16
PILOT PLANT .....	16
Ozone	17
CUSTOMER SERVICE .....	18
Customer Calls	18
Tours	18
RIVERVIEW PARK & ZOO .....	20
Park Operation & Facilities	20
Zoo Operations & Facilities	20
Capital Program	22
Revenue Contributions	22
Education	23
Other programming included: .....	23
Conservation	24
Research	24
Special Events	24
Staff & Volunteers	25
APPENDIX A – FINANCIAL STATEMENT .....	26
APPENDIX B – ABBREVIATIONS .....	41

---



# 2021 Annual Drinking Water Report

---

## **2021 Peterborough Utilities Commission**

Mayor Diane Therrien..... Chair  
Councillor Don Vassiliadis..... Vice-Chair  
Councillor Gary Baldwin ..... Commissioner  
Councillor Dean Pappas..... Commissioner  
Councillor Stephen Wright..... Commissioner

## **2021 Riverview Park and Zoo Advisory Committee**

<b>Name of Volunteer</b>	<b>Date Appointed</b>
Wally Davidson	Lifetime Member
Janet Lafortune	January 2018
Paul Hartung	January 2018
Shauna Moodie	January 2020
Susan Ramey	January 2020

### **On the Cover**

The newly refurbished High Street Water Tower had an extensive rehabilitation (page 4) in 2021. This photo was captured using drone photography, which allows the viewer to see the expansive City in the backdrop. The tower now displays the new Peterborough logo.

### *Questions or comments*

Please contact us either by mail, phone or email.

PUG Services Corp.  
1867 Ashburnham Drive, Peterborough, ON K9L 1P8  
705-748-9300, ext. 1258  
Patricia Skopelianos, Water Quality Assurance Manager  
[pskopelianos@peterboroughutilities.ca](mailto:pskopelianos@peterboroughutilities.ca)

## **Introduction**

All Peterborough Utilities Commission facilities are managed and operated under contract by PUG Services Corp. (PUGSC). The Water Utility section of PUGSC includes the following operating departments:

- Water Treatment Plant
- Water Distribution
- Water Engineering Services
- Riverview Park and Zoo

## **Drinking Water Process Description**

### **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 considered to be 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.

Peterborough Utilities continued its participation in the Source Water Protection Committee in 2021.

## **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 2021 was 11,301.84 megalitres (ML), this is an average of 30.96 ML daily (Table 1). The maximum daily pumpage of 36.87 ML, occurred on July 7<sup>th</sup>, was a 2% increase from the maximum daily value (30.46 ML) recorded on July 7<sup>th</sup>, 2020.



Table 1

Water Treatment Plant Operations	2020	2021
Total Annual Raw Water	11,116.32	11,301.84
Average Day ML	30.46	30.96
Total Annual Plant Effluent	9,707.10	9,916.06
Average Day ML	26.51	27.29
Max. Daily Pumpage	38.32 – Jul 7	37.49 – Aug 25
Max. Daily City Consumption	37.64 – Jul 7	36.87 – July 7
Peak Hourly Consumption Rate	74.78– Aug 26 @ 15:30h	70.69 – Dec 15 @20:0h
Total Wash Water	247.81	261.73
Average of Plant Effluent	2.5 %	2.6%
Total Zone #1 Pumpage	5,828.22	5,997.14
Average Day	15.93	16.47
Total Zone #2 Pumpage	3,878.89	3,918.91
Average Day	10.59	10.76

## 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:

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 470 kilometres of pipe (water mains), 2,394 hydrants and 27,323 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 H<sub>2</sub>O

The Utilities' mobile drinking water station, named PTBO H<sub>2</sub>O did not operate in 2021 due to the COVID-19 pandemic.

## Capital Works Summary

The Water Treatment Plant underwent the following upgrades in 2021

- ◆ Raw water ozone feed system preliminary design started.
- ◆ Replaced five of the fifteen HACH turbidity meters with Swan turbidity meters in the WTP.
- ◆ Two 30,000 L alum bulk chemical storage tank liners were replaced.
- ◆ TSSA upgrades were completed to the diesel engine driven pumps/generators at the WTP and Pumping Stations.

## High Street Tank

The High Street elevated water tower underwent the following upgrades in 2021

- ◆ Interior and exterior coating replacement;
- ◆ Interior and exterior steel blast clean and weld repairs;
- ◆ Piping, valving, and venting replacements;
- ◆ Health and Safety upgrades including new ladders, platforms, tie-offs and fall arrest system to meet new code requirements.

## Water Main Replacement

Approximately 445 m of distribution water mains were replaced on:

- ◆ Applegrove Avenue
- ◆ Rosehill Drive

## New Water Main Installation

Approximately 750 m of water main was installed to Bethune Street as part of the City's Jackson Creek Flood Diversion project.

## Water Service Replacement

A total of 70 water services were repaired and 25 water services were replaced in 2021.

## Water Main Rehabilitation

Approximately 900 m of water main was rehabilitated via cast-in-place-pipe liner (CIPP structural lining) on the following streets:

- ◆ Parkhill Road
- ◆ Stannor Drive



## Summary of Inspection & Compliance

### Ministry of Environment Conservation & Parks Inspection

During 2021, there was a Ministry of the Environment, Conservation & Parks (MECP) Inspection on July 17, 2021, report #1-29669702. 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 was a single incident in 2021 of an adverse water quality result. This occurred on September 21, 2021, with an exceedance of total coliform at the following distribution sampling stations; Spillsbury, Cumberland and Westridge sampling stations. The locations were resampled as per protocol and test results were negative for total coliform.

### Drinking Water Quality Management System

On October 30, 2006, the finalized standard was issued on the Environmental Bill of Rights Registry. The purpose of this Standard is to assist owners and operating authorities in the effective management and operation of their municipal residential drinking water systems.

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. Staff developed and implemented a QMS specific to the Peterborough municipal water system, which received full scope accreditation in June 2011.

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 September 2021. The internal audit found eight opportunities for improvement and no corrective actions required. The external audit, conducted by NSF International, later in October 2021 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, 5167-9BVR6A the withdrawal of 190.68 ML per day. Under this Regulation we are required to report the daily water taking annually by March 31<sup>st</sup> each year.

In 2021, there were no instances of water taking in excess of this daily limit. The total volume of water pumped into the Water Treatment Plant was 11,301.84 megalitres (ML), this is an average of 30.96 ML daily.



## Treated Water Production

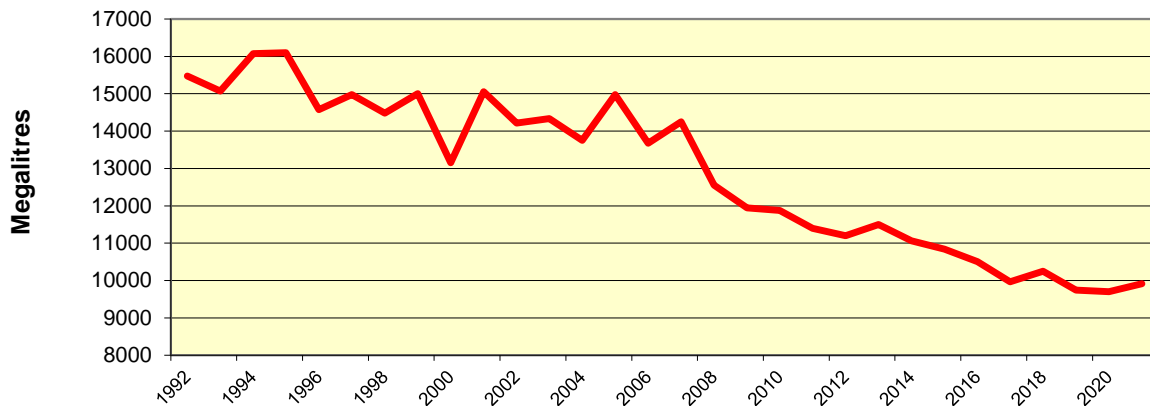
The Water Treatment Plant produced 9,916.06 megalitres (ML) in 2021, this is an average of 27.23 ML daily (Chart 1). Historically the highest water consumption recorded was in 1980 (18,621.20 ML).

Peterborough Utilities meters water usage and the majority of water usage in 2021 was by industrial, institutional and large commercial users. There was a certain amount of water used for distribution system maintenance in order to maintain the water quality in the distribution system.



Chart 1

**Treated Water Production**



█ 2021 water production was 9,916.06

## Water Quality Results

No known health-related water quality guidelines for inorganic (Table 2) and organic (Table 3) parameters were exceeded in 2021 in Peterborough's drinking water. In order to ensure that Peterborough's water is safe to drink, water quality is carefully monitored and subject to constant surveillance.

In addition to continuous monitoring of turbidity, chlorine, fluoride and pH levels 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 2021. 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 and SGS Lakefield Research Limited.

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 0.57 -2.86 mg/L.

### Turbidity

The average raw water turbidity in 2021 was 0.55 NTU; average during 2020 was 0.48 NTU. The monthly raw water turbidity peak occurred in July and August at 0.92 NTU as shown in Chart 2. The past 20-year average raw water turbidity was 0.57 NTU and treated water turbidity was 0.09 NTU.

# 2021 Annual Drinking Water Report

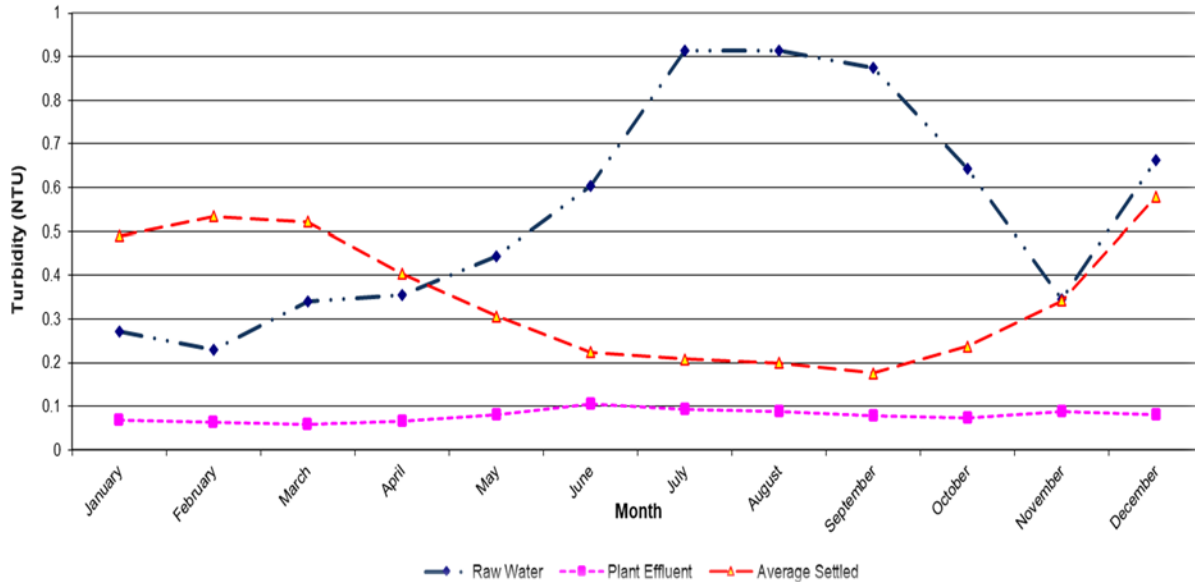
The zebra mussel population in the river could also be a contributing factor for the cyclical increases and decreases in raw water turbidity. Raw water turbidity has slowly dropped since 2008.

without exceeding 1.0 NTU. The average filtered water turbidity was 0.04 NTU for 2021 and in 2020 was 0.04 NTU. Filters are taken off-line when the turbidity reaches 0.15 NTU. The 2021 average treated water turbidity was measured at 0.08 NTU.

The performance criteria for filtered water is 0.30 NTU for 95% of the time,

Chart 2

Average Monthly Turbidity 2021



## Microbiological Standards Testing

### Escherichia coli

During 2021, a total of 247 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 90 Colony Forming Units (CFU) per liter. A total of 1,224 E.coli samples were analyzed from the plant effluent and distribution system.

## Total Coliform

The MECP guidelines for Total Coliform is to have all samples collected from the plant effluent to be zero CFU per litre of water sampled. During 2021, a total of 247 samples were analyzed from the Otonabee River. Monthly values ranged from 9 to 365 Colony Forming Units (CFU) per liter. A total of 1,224 Total Coliforms samples were analyzed from the plant effluent and distribution system.

## Inorganic Parameters

Table 2

Schedule 23	Unit	2021 Results	MAC
Antimony	mg/L	<0.00009	0.006
Arsenic	mg/L	<0.00002	0.025
Barium	mg/L	0.0258	1.0
Boron	mg/L	0.007	5.0
Cadmium	mg/L	0.000003	0.005
Chromium	mg/L	0.00008	0.05
Mercury	mg/L	<0.00001	0.001
Selenium	mg/L	0.00007	0.01
Uranium	mg/L	0.00017	0.02

## Organic Parameters

Table 3

Schedule 24	Unit	2021 Results	MAC
Alachlor	mg/L	<0.00002	0.005
Atrazine + N-dealkylated metabolites	mg/L	<0.00001	0.005
Azinphos-methyl	mg/L	<0.00005	0.02
Benzene	mg/L	<0.00032	0.005
Benzo(a)pyrene	mg/L	<0.000004	0.00001
Bromoxynil	mg/L	<0.00033	0.005
Carbaryl	mg/L	<0.00005	0.09
Carbofuran	mg/L	<0.00001	0.09
Carbon Tetrachloride	mg/L	<0.00016	0.005
Chlorpyrifos	mg/L	<0.00002	0.09

# 2021 Annual Drinking Water Report

Schedule 24	Unit	2021 Results	MAC
Diazinon	mg/L	<0.00002	0.02
Dicamba	mg/L	<0.0002	0.12
1,2-Dichlorobenzene	mg/L	<0.00041	0.2
1,4-Dichlorobenzene	mg/L	<0.00036	0.005
1,2-Dichloroethane	mg/L	<0.00035	0.005
Dichloromethane	mg/L	<0.00035	0.05
2,4-Dichlorophenol	mg/L	<0.00015	0.9
2,4-Dichlorophenoxy acetic acid (2,4-D)	mg/L	<0.00019	0.1
Diclofop-methyl	mg/L	<0.0004	0.009
Dimethoate	mg/L	<0.00006	0.02
Diquat	mg/L	<0.001	0.07
Diuron	mg/L	<0.00003	0.15
Glyphosate	mg/L	<0.001	1
Haloacetic acids (HAA)	mg/l	0.0750	0.08
Malathion	mg/L	<0.00002	0.19
2-Methyl-4-chlorophenoxyacetic acid	mg/L	<0.0000012	0.00012
Metolachlor	mg/L	<0.00001	0.05
Metribuzin	mg/L	<0.00002	0.08
Monochlorobenzene	mg/L	<0.0003	0.08
Paraquat	mg/L	<0.001	0.01
Pentachlorophenol	mg/L	<0.00015	0.06
Phorate	mg/L	<0.00001	0.002
Picloram	mg/L	<0.001	0.19
Polychlorinated Biphenyls (PCB)	mg/L	<0.00004	0.003
Prometryne	mg/L	<0.00003	0.001
Simazine	mg/L	<0.00001	0.01
Terbufos	mg/L	<0.00001	0.001
Tetrachloroethylene (perchloroethylene)	mg/L	<0.00035	0.03
2,3,4,6-Tetrachlorophenol	mg/L	<0.0002	0.1
Triallate	mg/L	<0.0001	0.23
Trichloroethylene	mg/L	<0.00044	0.005
2,4,6-Trichlorophenol	mg/L	<0.00025	0.005
Trifluralin	mg/L	<0.00002	0.045
Vinyl Chloride	mg/L	<0.00017	0.002

## Trihalomethanes -THM

In Ontario, the Ministry of the Environment Conservation & Parks' Maximum Acceptable Concentrations (MAC) for total THM's (total concentration of chloroform, bromoform, 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.

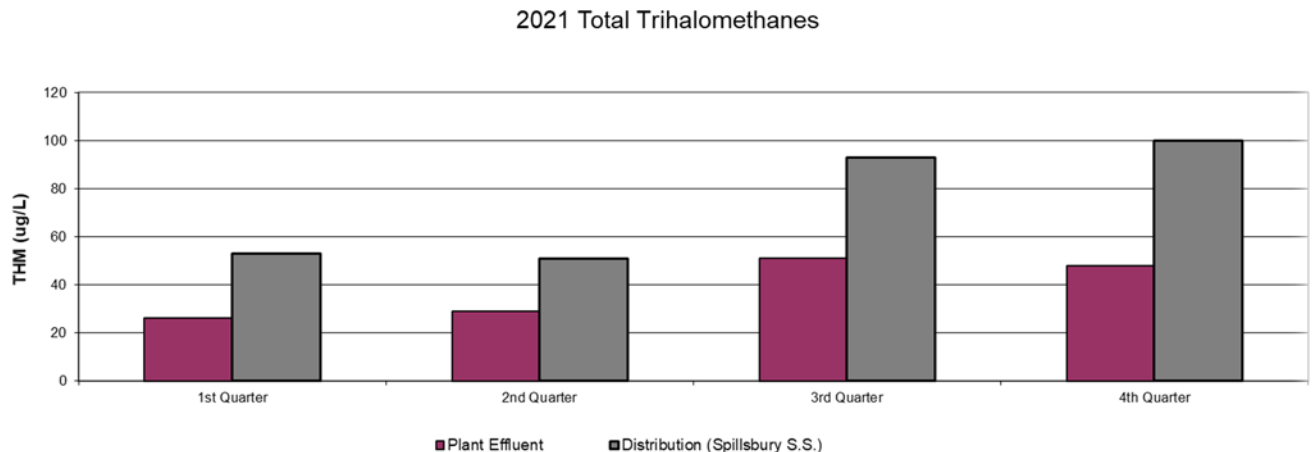
Trihalomethanes (THM's) are formed as a by-product when chlorine is used to disinfect water for drinking. The presence of organic materials along with the use of chlorine in the water treatment process can contribute to the formation of disinfection by-products. The THM's may have adverse health effects 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 2021 was 39 µg/L. The past 10-year average plant effluent has been 41 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 2021, 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 74 µg/L (Chart 3). The average THM value during 2020 was 77 µg/L. The 10-year average of distribution THM concentration was found to be 75 µg/L.

## Chart 3





## Haloacetic Acid

HAA's are another group of chemicals that are formed as disinfection by-products similar to trihalomethanes (THM).

The 2021 average treated water HAA was 36.9 µg/L and the average distribution sample was found to be 58 µg/L. O Reg. 170/03 was amended to include HAAs in 2020. The regulatory limit for distribution samples are 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 2021, the sodium result was found to be 7.3 mg/L (10.0 mg/L in 2020). 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. Peterborough is required to sample any residential house in the city that requests sampling for the same parameters mentioned above.

In 2021, we sampled 0 private plumbing (residential) and 20 distribution points for

lead. Customers are offered free testing of their private dwelling. Zero distribution samples tested over 0.0005 mg/L which indicates that the distribution system does not contribute to lead contamination.

## Taste and Odour

During 2021, 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 of 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 2021 was 5.8 ng/L and the average plant treated water was 6.8 ng/L (Chart 4).

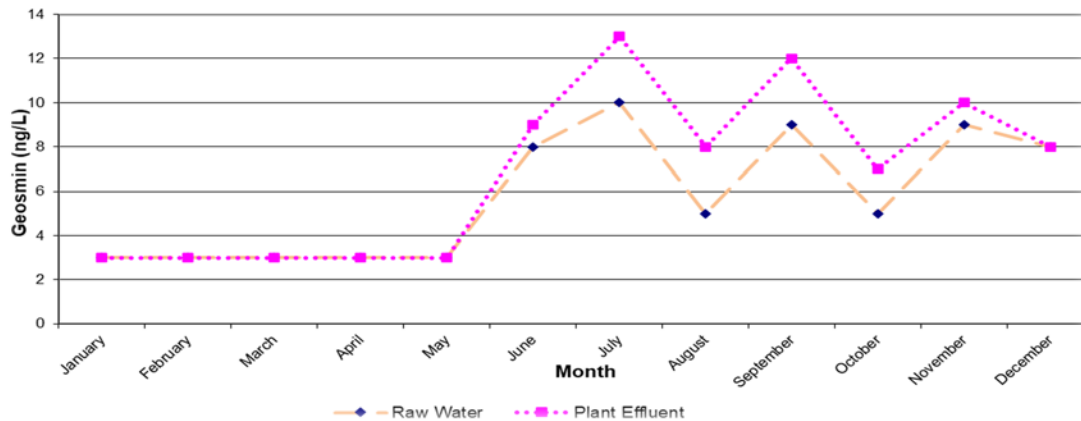
average raw water value during 2021 was 4.2 ng/L and the average plant effluent was 4.6 ng/L (Chart 5).

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.

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

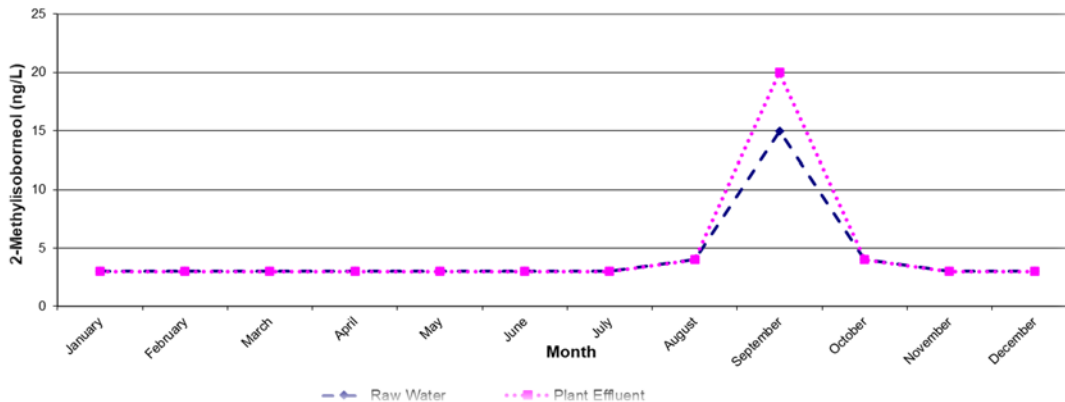
**Chart 4**

2021 Average Monthly Geosmin



**Chart 5**

2021 Average Monthly 2-Methylisoborneol (2-MIB)



## Summary Report

The summary of water delivered as per O. Reg. 170/03 Schedule 22 in 2020 is shown in Table 4.

Table 4

Month	Average Day (M <sup>3</sup> /d)	Maximum Day (M <sup>3</sup> /d)	Peak Flows (L/m)
January	24,379	29,187	20,269
February	24,401	27,876	19,358
March	24,544	32,152	22,328
April	24,974	29,028	20,158
May	27,959	34,737	24,123
June	30,921	36,483	25,335
July	28,266	32,433	22,523
August	31,939	37,490	26,035
September	29,509	32,125	22,309
October	28,087	31,458	21,846
November	26,332	29,037	20,165
December	25,431	27,931	19,397
<b>Rated Capacity</b>	<b>104.00</b>	----	----
<b>Approved Flowrate</b>	----	190.68	132,743 L/m

## Chemical Consumption

Table 5

Chemical Use	2020	2021
Total Chlorine	36,333 kg	40,474 kg
Average Dosage	1.20 mg/L	1.27 mg/L
Total Aluminum Sulphate	803,160 L	833,546 L
Average Dosage	47.2 mg/L	48.7 mg/L
Total Hydrofluosilicic Acid	19,438 L	20,812 L
Average Dosage	0.68 mg/L	0.59 mg/L
Total Sodium Hydroxide	50,788	70,962
Average Dosage	3.18 mg/L	3.27 mg/L

## Chlorine

The average dose of chlorine for 2021 was 1.27 mg/L (Table 5). 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 from typically between May to October.

## 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 also the concentration of the raw water. The average dosage of fluoride added to the water in 2021 was approximately 0.59 mg/L (Table 5). The average treated water fluoride residual was 0.45 mg/L. The average fluoride concentration found in the raw water (natural fluoride) during 2021 was 0.11 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 2021 at an average rate of 48.7 mg/L (Table 5). The average alum dosage during 2020 was 47.2 mg/L. 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 2021 was 0.039 mg/L the operational guideline for aluminium is 0.1 mg/L.

## Water Treatment Plant

Annual maintenance was conducted at the Water Treatment Plant, Water Street Pump house, 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 repair



## Impact of Climate Event

The temperature during June, July and August averaged approximately 20.1°C. This is considered to be slightly above normal summertime

temperature. Environment Canada data describes the average normal value of 18.3°C (normal data 1981 – 2010). The summer months in 2021 were hotter than normal with 11 days where temperatures were higher than 30°C. Rainfall totals for the three summer months of June, July and August was 251.3 mm. This is considered to be a normal rainfall values, however the significant rainfall events were in the month of July with 138 mm total rainfall.

The Otonabee Water Response Team met monthly from May – October 2021. A level 1 low water condition was declared on June 9, 2021, and rescinded on August 9, 2021. On September 9, 2021, the region returned to a Level 1 low water condition, and this was rescinded on October 7, 2021, returning the watershed to normal conditions. When a Level 1 Low Water Condition is declared, water users are asked to voluntarily reduce their water consumption by 10%. This includes municipalities, aggregate operations, golf courses, water bottlers, farm irrigation, and private users.

## Pilot Plant

The Peterborough Water Treatment Plant has conducted pilot-scale studies in an effort to improve water quality, optimize production, 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. The primary objectives using the ozone pilot were to determine if ozone, advanced oxidation, and biofiltration will enhance our water quality and provide operational flexibility as an integral component of our multi-barrier approach to water treatment.

## Ozone

Ozone application and the benefits for enhanced water quality has been an important focus of our pilot-scale research program since 2015. Previous research at our facility has shown the effectiveness of ozone on the reduction of disinfection by-product (DBP) formation and taste-and-odour compounds, geosmin (GSM) and 2-methylisoborneol (2-MIB). Our current studies in 2021 focused on the assessment and integration of ozone into full-scale applications.

Optimization of ozone dose, evaluation of ozone demand and half-life, and the impact on coagulation and biofiltration were key components of our focus. Biologically active filtration (biofiltration) allows the growth of naturally occurring biomass on the surface of granular filter media. Previous studies have shown the ability of biofiltration to improve the performance of conventional filtration through the removal of organic matter. The primary objective of our study was to determine if ozone could be incorporated as a pre-coagulant oxidant and assess infrastructure and energy costs associated with implementation.

The ozone dose was optimized through evaluation of ozone concentrations of 3.0, 2.5, 1.5, and 1.0 mg/L. Ozone decay rates were monitored at the

variable ozone doses. The ozone demand in our source water was 1.7 mg/L, and ozone doses in the range of 1.5 to 3.0 mg/L were effective in reducing natural organic matter (NOM), DBP formation and GSM and 2-MIB compounds. Trihalomethanes (THMs) and haloacetic acids (HAAs) were reduced by 35% and 40%, respectively, and GSM and 2-MIB were eliminated below detectable levels. Ozone doses of 1.0 mg/L were shown to be less effective for NOM reduction. Based on this data, ozone systems are being designed to target maximum 3.0 mg/L ozone dose at 60 MLD water treatment plant flows.



Ozone residual also appears to decay quickly under cold-water conditions, with a half-life of 0.5 minutes observed for ozone doses of 2.0 and 2.5 mg/L, and a half-life of 3.4 minutes at 3 mg/L. Decay rates under all water temperatures and seasonal conditions must be examined further, in order to design ozone off-gas and quenching systems.

Coagulant dose was optimized through targeting equivalent total organic carbon (TOC) reduction post-sedimentation. Following addition of ozone in the source water, coagulant demand decreased up to 30% prior to observing a decline in settled water effluent quality. Coagulant dose reduction plays an important role in minimizing sludge formation, optimizing water quality and filter performance, and



decreasing chemical use required in the treatment process.

The optimization of ozone dose did not improve filter performance, however, with increased loss-of-head observed during pre-ozonation. The loss-of-head (LOH) is associated with increased air binding in the filter media, and the dissolved oxygen remained elevated at all ozone doses. The mechanism causing the increased LOH requires further investigation, as elevated LOH will impact filter performance and increase energy demand and chemical use during full-scale treatment.

Ozone was also shown to provide enhanced biofiltration performance in the filter media, with ATP concentrations increasing from 51 ng/g to 86 ng/g following the addition of ozone in the source water. Bioactivity in the filter media increased following ozonation even under cold-water conditions. This may provide long-term benefits in further reducing DBP precursors and taste-and-odour compounds. Chlorinated backwash was not observed to impact water quality or the concentration of biomass in the filter. This result was important to our water treatment process in Peterborough as it indicates chlorine quenching, or modification of infrastructure to achieve chlorine-free backwash water, is not required to facilitate enhanced biofiltration performance.

Studies in 2022 will focus on decreasing the ozone retention time to 1.5 minutes, the impact of calcium thiosulphate (CTS) on coagulation and filter performance, and the potential for advanced oxidation (peroxone) to further ameliorate GSM and 2-MIB under peak flow conditions.

Monitoring parameters, including ozone residual and oxidative reduction potential (ORP), will also be employed to evaluate control systems to modulate ozone dose through our SCADA software

## **Customer Service**

### **Customer Calls**

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.

In 2021, staff responded to a total of 20 inquiries. The 20 inquiries were related to the following concerns; 45% of customer concern calls were relating to colour (usually rusty coloured water), 5% were relating to particulate matter, a total of 50% relating to taste and odour, and 0% relating to bacteriological concerns (Chart 6). The number of calls were consistent in 2021 to those received in 2020.

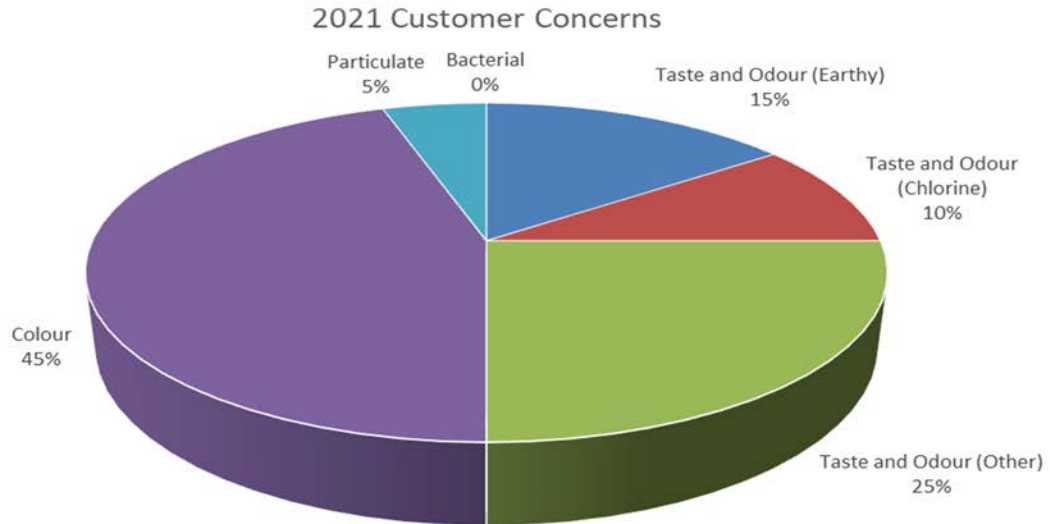
A further breakdown of the 10 taste and odour complaints revealed the following: 3 concerns were for an earthy musty odour, 2 concern was for a chlorine taste and odour, and 5 concerns were for various other taste and odours, from metallic to medicinal.

### **Tours**

Tours have been an important part of public education at the Peterborough Water Treatment Plant. During 2021 tours were suspended as a result of the

pandemic.

Chart 6



## Riverview Park & Zoo

In 2021 Riverview Park and Zoo operations were severely impacted by the COVID-19 pandemic. The Park and Zoo was closed for almost the entire year as a precautionary measure in response to the ongoing impact of the COVID pandemic. Many areas and facilities remained closed for most of the year and all our facility bookings and many of our education programs, special events, etc. were cancelled. Despite restrictions and supply issues associated with the pandemic, some progress was made on ongoing improvements to the facilities and equipment in 2021.



The zoo's animal collection saw many changes in 2021 with the deaths of some of our older animals as well as new acquisitions. Deaths included a pot-bellied pig, a Sichuan takin, a reindeer, a yak and the passing of Ferrari, our last two-toed sloth. Other changes included the acquisition of a variety of animals including two Sichuan takin, two alpacas, a domestic yak, and one Eurasian lynx. Additions to the collection also included the birth of a meerkat and two additional successful hatchings of Sulawesi forest turtles.

## Park Operation & Facilities

As noted above, most of the Park and Zoo's areas and facilities were closed for the duration of 2021. The miniature train ride was closed for the year. The zoo area was closed for the year, other than for pre-booked guided tours. The Snack Bar and the gift shop remained closed for the year. The splash pad was closed for the year. The park grounds and pathways were open for walk-through access and the disc golf course and playground both were open for limited use.

## Zoo Operations & Facilities

Zoo operations and specifically animal care and wellness were identified as first priorities during the pandemic. Ensuring that excellent animal care was delivered, proved to be challenging due to staffing issues. Our operations were impacted by reduced seasonal staffing due to the fiscal impact of the pandemic, segregated teams, work areas, and routines as part of our pandemic response plan, as well as by staff absences due to COVID testing/self-isolation, etc. Having adequate resources to provide animal care required extensive adaptation and the curtailment of many non-critical activities.

Regular and emergency veterinary care was provided primarily by consulting veterinarian Dr. John Sallaway throughout 2021. Dr. Mike Cranfield remained unavailable for much of the year due to the border closure. Park and Zoo Animal Care Staff worked with Dr. Sallaway throughout the year to provide planned animal health care to the animals in our collection. Animals were examined and/or treated as part of their annual health care program. This

# 2021 Annual Drinking Water Report

included physical exams, surgery, numerous vaccinations/treatments, blood samples, the trimming of many hooves/claws/beaks/tusks, dentistry, and dental cleaning.

## Zoo Animal Collection

In 2021 there were 13 births/hatchings and 25 deaths of animals during the year. Postmortems were performed on those animals that had died, to determine the cause of death where Table 6

possible. 23 new animals were acquired during the year.

As of December 31, 2021, the animal collection on site consisted of 127 animals, representing a total of 58 species (excluding groups of fish and invertebrates). The collection had 39 animals in on loan and 12 animals out on loan.(Table 6).

	January 1	Birth/ Hatchings	Acquisitions	Deaths	Disposition	December 31
# Animals Owned on site	93	10	18	24	9	88
# Animals at Zoo on Loan	33	3	5	1	1	39
# Animals out on loan	23	0	0	0	2	12
Total Animals On Site	126	13	31	25	10	127





## Capital Program

Work completed under the 2021 capital program included security upgrades to the takin exhibit stand-off fence, new enrichment facilities in several exhibits, new automatic water bowls in the yak and takin exhibits, a new garbage compound, renovation of the train station, and new barricades at several exhibits (part of our COVID precautions).

## Revenue Contributions

In 2021, the impact of the pandemic was devastating to Riverview Park and Zoo's revenue for the year, with no train operations, no food services, and limited facility bookings and retail sales.

That being said however, the Limited-Edition Miniature Train Ride Puzzle Fundraiser was a huge success in the fall of 2021. The project was championed by Advisory Board members, who recruited 5 active retailers including Brant Basics, House of Scales, Griffins Greenhouse, Fork in the Road Country Market and Ennismore Pharmacy. With the support of these advocates, all 1,500 puzzles sold out. This 2-month effort raised \$20,000 towards the Train Replacement Capital Campaign Goal of \$300,000.



The Kiwanis Club of Peterborough came on board our capital train campaign as a partnership level sponsor, committing to a \$25,000 donation for a train passenger coach. Support achieved in 2020/2021, in addition to online donations, brought us to \$130,000 or 43% of our campaign goal by the end of 2021.



Social media fundraising campaigns continued to increase on-line donations and helped to maintain the animal adoption program while closed to the public. Dedicated volunteers and part-time staff helped to open the gift shop for holiday sales in November and December.

Local businesses stepped up to help support the Park and Zoo including Ennismore Pharmacy's Mother's Day, Father's Day and seasonal holiday raffle soliciting support from 30 local businesses for gift basket items raising \$7,500 in 2021.

Businesses like Brealey Animal Clinic and the Kawartha Veterinary Association chose Riverview Park and Zoo as the recipient of the annual fundraisers with their membership or clients.

Grant applications and awards were maximized due to support funding made available in response to the COVID pandemic for the tourism sector and to encourage youth employment. Some significant examples of success include:

- Canada Summer Jobs - \$20,954
- Tourism Resiliency Fund Peterborough/Kawartha's Economic Development - \$8,800
- Hydro One Networks Inc., Safe Communities and Workplaces - \$25,000

- Healthy Communities Fund - \$18,000
- Pathway to Stewardship Delivery Partner – 2021 \$5,100 & 2022 \$5,100
- Employment and Social Development Canada's Enabling Accessibility - \$100,000

2021/2022 Totalling \$183,954

## Education

In person education programs in the form of pre-booked guided tours throughout 2021 met COVID regulations and restrictions. Limited spaces were booked quickly.

Although we were unable to open the zoo area in most of 2021, our staff and volunteers were able to provide 350 guided group Tours and Treks. Tours were offered from July 2<sup>nd</sup> to October 11<sup>th</sup>, generating \$5,530 in donations.

Virtual adaptations of our education programs evolved in 2021 allowing us to invest in technology and virtual classrooms in partnership with the school boards. The Bondar Challenge program connecting youth to nature through the art of photography I partnership with Otonabee Conservation engaged 28 participants who swept the Ruby Summer Camp National Award category.

Other programming included:

- virtual "Classroom Pets" "Zoo Trek" tours as delivery agents of the Pathway to Stewardship

Program: Classroom Pets reaching early years classrooms focused on Landmark #3: weekly positive interactions with animals. We reached nearly 600 students with this program and received funding of \$5,100 through Camp Kawartha's Ontario Trillium Foundation Grant.

- Virtual Environment Symposium with both local school boards on biodiversity and conservation in May engaged over 750 students over 2 days.





# 2021 Annual Drinking Water Report

- Virtual Peterborough Children's Water Festival Water Wednesday session animated Water Festival Stations Otterly Amazing and Rolling through the Shed at the zoo had nearly 1500 participants across grade 3, 4, 7 & 8 students.
- Riverview Park and Zoo partnered with Trent University to create CALAS symposium virtual videos on "Culture of Care, Enrichment and Training Programs" at accredited zoos for professionals who work with animals in a research setting.
- The virtual Bringing the Zoo to You" campaign continued in 2021 and included live events and recorded videos available to our 22,478 followers, (4,558 Twitter, 13,000 Facebook, 12,373 Instagram, 49004,699 Instagram).



This programming was made possible through the support of 41 active volunteers in 2021 who supported education programs and guided tours, created virtual program resources at home, participated in litter pick-up and invasive species removal day-events, sat on advisory boards and helped operate our gift shop.. These volunteers contributed over 700 hours in-kind.

In addition, we hosted 9 post-secondary

placement students from Conservation Biology, Travel and Tourism, Museum and Curatorship Management Program and Alternative Education Placement Programs from Trent University and Fleming College that provided over 400 hours of research, resource development and ethogram observations in 2021.

Young Canada Works Heritage grant for Public Education student positions was increased from \$10,000 to \$23,000. Canada Summer Jobs awarded a \$3,500 grant for a Guest Services Position.

## Conservation

Last year the Park and Zoo's conservation program included our ongoing support of the Ontario Turtle Conservation Centre's conservation work by donating heat lamp bulbs, turtle feed (smelt) and equipment. The Park and Zoo also participated in the Association of Zoos and Aquariums (AZA) Stud Book for red-necked wallaby, Sichuan takin and bobcat. We also participated in the slender-tailed meerkat and common squirrel monkey AZA Species Survival Plans, as well as the Emu and Brazilian agouti Population Management Plans.

## Research

In 2021 the Park and Zoo participated in the Ontario Turtle Conservation Centre's Blanding's Turtle research project as well as hosting research projects by university biology and conservation biology students.

## Special Events

## 2021 Annual Drinking Water Report

Unfortunately, all of the special events planned for 2021 had to be cancelled. This included the Peterborough Children's Water Festival, the Zoo Fun Run, and the Summer Concert Series

### Staff & Volunteers

As of December 2020, permanent staff included 1 Manager and Curator, 1 Park and Zoo Supervisor, 1 Program Supervisor, 1 Groundskeeper, 1 Animal Care Technician, 3.5 Zookeepers and 1 Park & Zoo Maintenance.

The majority of our student positions were cancelled due to the pandemic and the employment periods of the remainder were significantly delayed/reduced. Seasonal staffing peaked in July and August with a total of 9 student employees assisting with Park and Zoo operations. Student employee positions included 4 zookeepers, 2 public educators, and 3 horticulture/groundskeeping workers.



# 2021 Annual Drinking Water Report

---

## Appendix A – Financial Statement

**PETERBOROUGH UTILITIES COMMISSION  
FINANCIAL STATEMENTS  
AT DECEMBER 31, 2021**

**TABLE OF CONTENTS**

	<b><u>Page Number</u></b>
<b>INDEPENDENT AUDITOR'S REPORT</b>	
<b>FINANCIAL STATEMENTS</b>	
Statement of Financial Position	1
Statement of Operations and Accumulated Surplus	2
Statement of Cash Flows	3
Statement of Changes in Net Financial Assets	4
Notes to Financial Statements	5 to 12

# 2021 Annual Drinking Water Report

---



**Baker Tilly KDN LLP**  
272 Charlotte Street  
Peterborough, ON  
Canada K9J 2V4

**D: 705.742-3418**  
**F: 705.742-9775**

**[www.bakertilly.ca](http://www.bakertilly.ca)**

## **INDEPENDENT AUDITOR'S REPORT**

### **To the Chair and Members of the Peterborough Utilities Commission**

#### *Opinion*

We have audited the financial statements of Peterborough Utilities Commission (the Commission), which comprise the statement of financial position as at December 31, 2021 and the statements of operations and accumulated surplus, changes in net financial assets and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Commission as at December 31, 2021, and the results of its operations and cash flows for the year then ended in accordance with Canadian Public Sector Accounting Standards.

#### *Basis for Opinion*

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Commission in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

#### *Responsibilities of Management and Those Charged with Governance for the Financial Statements*

Management is responsible for the preparation and fair presentation of the financial statements in accordance with Canadian Public Sector Accounting, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Commission's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Commission or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Commission's financial reporting process.

ASSURANCE • TAX • ADVISORY

*Baker Tilly KDN LLP is a member of Baker Tilly Canada Cooperative, which is a member of the global network of Baker Tilly International Limited. All members of Baker Tilly Canada Cooperative and Baker Tilly International Limited are separate and independent legal entities.*

Peterborough

Courtice

Lindsay

Cobourg

---

# 2021 Annual Drinking Water Report

---

## *Auditor's Responsibilities for the Audit of the Financial Statements*

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Commission's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Commission's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Commission to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Chartered Professional Accountants  
Licensed Public Accountants

*Baker Tilly KDN LLP*

Peterborough, Ontario  
April 21, 2022







# 2021 Annual Drinking Water Report

**PETERBOROUGH UTILITIES COMMISSION**  
**STATEMENT OF FINANCIAL POSITION**  
**At December 31, 2021**

	2021 \$	2020 \$
<b>FINANCIAL ASSETS</b>		
Cash (Note 3)	26,924,795	23,494,365
Accounts receivable		
Customer accounts	897,300	897,321
Sewer surcharge	1,304,193	1,257,438
Sundry	369,995	282,452
Unbilled water revenue on customer accounts	1,579,000	1,579,000
Unbilled sewer surcharge	1,596,000	1,596,000
	<b>32,671,283</b>	<b>29,106,576</b>
<b>LIABILITIES</b>		
Accounts payable and accrued charges	5,616,203	2,252,985
Sewer surcharge payable (Note 5)	3,650,094	3,543,832
Long term debt (Note 4)	13,173,275	14,216,370
Customer deposits	430,688	803,223
	<b>22,870,260</b>	<b>20,816,410</b>
<b>NET FINANCIAL ASSETS</b>	<b>9,801,023</b>	<b>8,290,166</b>
<b>NON-FINANCIAL ASSETS</b>		
Inventories	609,003	527,539
Tangible capital assets (Note 6)	120,538,685	119,408,867
	<b>121,147,688</b>	<b>119,936,406</b>
<b>ACCUMULATED SURPLUS (Note 7)</b>	<b>130,948,711</b>	<b>128,226,572</b>

Approved By The Commission

  
 \_\_\_\_\_ Chair

  
 \_\_\_\_\_ Member

The accompanying notes are an integral part of this financial statement.



# 2021 Annual Drinking Water Report

**PETERBOROUGH UTILITIES COMMISSION**  
**STATEMENT OF OPERATIONS AND ACCUMULATED SURPLUS**  
**For The Year Ended December 31, 2021**

	Budget 2021 \$ (Unaudited)	Actual 2021 \$	Actual 2020 \$
<b>REVENUES</b>			
Sale of water	18,321,000	18,559,285	18,351,206
Contributed capital installation charges	350,000	118,054	43,831
Development charges earned	1,437,000	831,010	58,942
Fire protection	650,000	650,000	650,000
Sewer surcharge billings	430,000	430,000	422,000
Riverview Park and Zoo (Note 11)	59,000	78,383	57,172
Interest	184,000	153,894	166,849
Other	300,000	449,686	237,612
Electricity	425,000	300,110	336,372
Donations	25,000	51,877	4,603
	22,181,000	21,622,299	20,328,587
<b>EXPENSES</b>			
Water treatment and storage	4,766,000	4,133,072	4,189,684
Water distribution	2,324,000	2,418,859	2,530,589
Riverview Park and Zoo (Note 11)	1,589,000	1,745,718	1,678,329
Administration	4,018,000	4,145,871	3,769,095
Amortization	6,300,000	6,103,414	6,197,228
Interest	417,000	353,226	276,843
	19,414,000	18,900,160	18,641,768
<b>ANNUAL SURPLUS</b>	<b>2,767,000</b>	<b>2,722,139</b>	<b>1,686,819</b>
<b>OPENING ACCUMULATED SURPLUS</b>	<b>127,761,000</b>	<b>128,226,572</b>	<b>126,539,753</b>
<b>CLOSING ACCUMULATED SURPLUS</b>	<b>130,528,000</b>	<b>130,948,711</b>	<b>128,226,572</b>

The accompanying notes are an integral part of this financial statement.

# 2021 Annual Drinking Water Report

## PETERBOROUGH UTILITIES COMMISSION STATEMENT OF CASH FLOWS For The Year Ended December 31, 2021

	2021 \$	2020 \$
<b>CASH PROVIDED BY (USED IN):</b>		
<b>OPERATIONS</b>		
Annual surplus	2,722,139	1,686,819
Add: Non-cash charges to operations		
Amortization	6,103,414	6,197,228
Contributed capital installation charges	(118,054)	(43,831)
	8,707,499	7,840,216
Change in non-cash working capital items (Note 8)	2,881,204	(627,803)
	11,588,703	7,212,413
<b>INVESTING ACTIVITY</b>		
Purchase of tangible capital assets	(7,115,178)	(3,437,043)
<b>FINANCING ACTIVITIES</b>		
Repayment of long term debt	(1,043,095)	(1,389,333)
Long term debt proceeds	-	6,000,000
	(1,043,095)	4,610,667
<b>NET CHANGE IN CASH DURING THE YEAR</b>	<b>3,430,430</b>	<b>8,386,037</b>
<b>CASH POSITION - BEGINNING OF YEAR</b>	<b>23,494,365</b>	<b>15,108,328</b>
<b>CASH POSITION - END OF YEAR</b>	<b>26,924,795</b>	<b>23,494,365</b>

The accompanying notes are an integral part of this financial statement.

# 2021 Annual Drinking Water Report

**PETERBOROUGH UTILITIES COMMISSION**  
**STATEMENT OF CHANGES IN NET FINANCIAL ASSETS**  
**For The Year Ended December 31, 2021**

	Budget 2021 \$ (Unaudited)	Actual 2021 \$	Actual 2020 \$
<b>Annual Surplus</b>	2,767,000	2,722,139	1,686,819
Acquisition Of Tangible Capital Assets	(11,599,000)	(7,233,232)	(3,480,874)
Amortization Of Tangible Capital Assets	6,300,000	6,103,414	6,197,228
Decrease (Increase) in Inventories	-	(81,464)	(104,200)
Decrease (Increase) in Prepaid Expenses	-	-	291,424
<b>Change In Net Financial Assets</b>	<b>(2,532,000)</b>	<b>1,510,857</b>	<b>4,590,397</b>
<b>Net Financial Assets, beginning of year</b>	<b>7,448,000</b>	<b>8,290,166</b>	<b>3,699,769</b>
<b>Net Financial Assets, end of year</b>	<b>4,916,000</b>	<b>9,801,023</b>	<b>8,290,166</b>

The accompanying notes are an integral part of this financial statement.

# 2021 Annual Drinking Water Report

---

## **PETERBOROUGH UTILITIES COMMISSION**

### **NOTES TO THE FINANCIAL STATEMENTS**

**For The Year Ended December 31, 2021**

---

#### **1. NATURE OF ORGANIZATION**

Operating under the authority of the Municipal Act, the Peterborough Utilities Commission (the "Commission") provides water services to the residents of the City of Peterborough along with operational governance and funding for the Riverview Park and Zoo.

#### **2. SIGNIFICANT ACCOUNTING POLICIES**

The financial statements of the Peterborough Utilities Commission have been prepared in accordance with Canadian generally accepted accounting principles for local governments and their local boards as recommended by the Public Sector Accounting Board of the Chartered Professional Accountants Canada.

Significant aspects of the accounting policies adopted by the Commission are as follows:

##### **(a) Recognition of Revenue and Expenses**

Revenue is recorded using the accrual basis of accounting, as water is used by customers. Unbilled revenue is calculated as the estimated consumption between the last meter reading date and the year end date.

The value of distribution systems installed by developers is recorded in revenue as capital installation charges in the year in which the Commission assumes ownership at the fair market value.

Development charges are recognized as revenue when they are transferred out of the reserve fund and spent on growth related projects.

Revenue from fire protection, sewer charges and electricity is recognized when the service is provided.

Expenses are recognized in the period the goods or services are acquired and a legal liability is incurred by transfers are due.

##### **(b) Management Estimates**

The preparation of financial statements in conformity with Canadian generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities as well as the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenditures during the year. Significant estimates and assumptions used in the preparation of financial statements include, but are not limited to: estimates of revenue, allowance for doubtful accounts, and amortization rates and carrying values of property, plant and equipment. Actual results could differ from these estimates.

##### **(c) Inventories**

Inventories consist of maintenance supplies and construction materials and are valued at the lower of moving average cost and replacement cost.

##### **(d) Tangible Capital Assets**

Tangible capital assets are stated at cost or deemed cost. Amortization on the water treatment plant and reservoirs, distribution system and Riverview Park and Zoo (purchased from operating and donated funds) is recorded on a declining balance basis at a rate of 5% per annum. Water meters are amortized on a straight line basis over 20 years. The Commission capitalizes assets with a value of \$5,000 or greater.

Tangible capital assets categorized as construction-in-progress are not amortized until they are put into service.

## **PETERBOROUGH UTILITIES COMMISSION** **NOTES TO THE FINANCIAL STATEMENTS** **For The Year Ended December 31, 2021**

---

### **2. SIGNIFICANT ACCOUNTING POLICIES - (Continued)**

#### **(e) Reserve Funds**

Certain amounts as approved by the Commission and those required under legislative or other authority are set aside in reserve funds for future operating or capital purposes. Transfers to and/or from reserve funds are an adjustment to the respective fund when approved or required by agreement.

The following reserve funds are included in the accumulated surplus:

#### **(i) Water Treatment Plant Reserve Fund**

In December 1990, the City of Peterborough passed a by-law authorizing the Peterborough Utilities Commission to establish a reserve fund for the purpose of upgrading the water treatment plant. The established practice is to appropriate 4.2% of the water revenues to this fund each year. Utilization of these funds is authorized by the Commission.

#### **(ii) Development Charges Act Reserve Fund**

The Peterborough Utilities Commission is authorized under the City of Peterborough by-law to establish a reserve fund for development charges. The purpose of the fund is to cover growth related net capital costs incurred by the Water Utility for water treatment, storage and distribution systems.

#### **(iii) Park And Zoo Major Projects Reserve Fund**

In September 1993, the City of Peterborough passed a by-law authorizing the Peterborough Utilities Commission to establish a reserve fund for major projects at the Riverview Park and Zoo. The revenues received for this fund include donations from estates and the general public, the utility's share of profits from the refreshment booth operations and profits from the sale of birds and animals. Utilization of these funds is authorized by the Commission on a project by project basis based upon the recommendation of the Riverview Park and Zoo Advisory Committee.

#### **(iv) Park and Zoo Animal Care Reserve Fund**

In July 1999, the City of Peterborough passed a by-law authorizing the Peterborough Utilities Commission to establish a reserve fund for animal care at the Riverview Park and Zoo. The fund was established through a capital donation from a Peterborough resident. The income generated annually will be used for the care, treatment, habitat or display of the animals at the Riverview Park and Zoo for special or exceptional purposes beyond standard care.

#### **(v) Park and Zoo State of Good Repair Reserve Fund**

In November 2016, the Commission authorized the establishment of an internally restricted Riverview Park and Zoo state of good repair reserve fund. The purpose of the fund is to cover major repair and maintenance costs incurred by the Riverview Park and Zoo that would be required to maintain the quality of its tangible capital assets.

#### **(f) Non-Financial Assets**

Tangible capital and other non-financial assets are accounted for as assets by the Commission because they can be used to provide services in future periods. These assets do not normally provide resources to discharge the liabilities of the Commission unless they are sold.



# 2021 Annual Drinking Water Report

**PETERBOROUGH UTILITIES COMMISSION**  
**NOTES TO THE FINANCIAL STATEMENTS**  
**For The Year Ended December 31, 2021**

**2. SIGNIFICANT ACCOUNTING POLICIES - (Continued)**

**(g) Inter-Entity Transactions**

The organization has an agreement with the City of Peterborough, which results in transactions between the two entities.

Allocated costs between the City of Peterborough and the Commission, are measured at the exchange amount, which is the amount of consideration established and agreed to by the parties.

Unallocated costs are measured at the carrying amount, which is the amount recorded in the records of the City of Peterborough.

**3. CASH**

	2021 \$	2020 \$
Unrestricted cash	15,713,115	13,180,507
Restricted cash	11,211,680	10,313,858
	26,924,795	23,494,365

**4. LONG TERM DEBT**

Long term debt is issued on behalf of the Commission by The Corporation of the City of Peterborough and consists of the following:

Date of Maturity/Payment Terms	Interest Rate %	2021 \$	2020 \$
July 5, 2027, semi-annual blended payments of \$274,120	3.18	2,973,275	3,416,370
November 6, 2036, semi-annual principal payments of \$150,000 plus interest	2.79	4,500,000	4,800,000
December 15, 2040, semi-annual principal payments of \$150,000 plus interest	2.04	5,700,000	6,000,000
		13,173,275	14,216,370

# 2021 Annual Drinking Water Report

## PETERBOROUGH UTILITIES COMMISSION

### NOTES TO THE FINANCIAL STATEMENTS

For The Year Ended December 31, 2021

#### 4. LONG TERM DEBT- (Continued)

Future repayments for the long term debt are as follows:

	Principal \$	Interest \$	Total \$
2022	1,057,297	329,129	1,386,426
2023	1,071,955	299,982	1,371,937
2024	1,087,083	270,947	1,358,030
2025	1,102,695	240,262	1,342,957
2026	1,118,808	209,659	1,328,467
Thereafter	7,735,437	1,073,992	8,809,429
	13,173,275	2,423,971	15,597,246

#### 5. RELATED PARTY AND INTER-ENTITY TRANSACTIONS

The Commission is a board of the City of Peterborough and is consolidated with the City's financial statements. In the ordinary course of business, the Commission enters into transactions with the Corporation of the City of Peterborough and other related corporations. These transactions, which include the sale of water and the purchase and sale of other goods and services, are exchanged at the same prices and terms as arm's length customers. The affiliated corporations of the Commission are:

The City of Peterborough Holdings Inc.,  
Peterborough Utilities Services Inc.,  
Peterborough Utilities Inc., and  
PUG Services Corp.

Details of services provided to Peterborough Utilities Commission during the year by Peterborough Utilities Services Inc. are as follows:

	2021 \$	2020 \$
Expenditures		
Professional services	9,188,882	8,511,592
Building rent	370,405	381,216
Software and equipment rent	171,739	109,147
	9,731,026	9,001,955

Billing and collecting for the sewer surcharge is done by the Commission for the City of Peterborough. During the year \$430,000 (2020 - \$422,000) was recognized as revenue for providing this service. At December 31, the sewer surcharge payable of \$3,650,094 (2020 - \$3,543,832) recognized on the statement for financial position is payable to the City of Peterborough. All amounts owing to the City are unsecured, without interest and no specific terms of repayment.

# 2021 Annual Drinking Water Report

**PETERBOROUGH UTILITIES COMMISSION**  
**NOTES TO THE FINANCIAL STATEMENTS**  
For The Year Ended December 31, 2021

6. **TANGIBLE CAPITAL ASSETS**

	Water Treatment Plant and Reservoirs \$	Water Distribution System \$	Riverview Park and Zoo \$	Other \$	Construction In Progress \$	Total \$
<b>Cost Or Deemed Cost</b>						
Balance at January 1, 2020	51,024,728	182,520,927	11,287,467	17,403	443,362	245,293,887
Additions	285,174	613,311	198,704	-	2,383,685	3,480,874
Balance At December 31, 2020	51,309,902	183,134,238	11,486,171	17,403	2,827,047	248,774,761
Additions	228,071	5,860,957	292,217	-	851,987	7,233,232
Balance At December 31, 2021	51,537,973	188,995,195	11,778,388	17,403	3,679,034	256,007,993
<b>Accumulated Amortization</b>						
Balance at January 1, 2020	26,003,804	92,119,190	5,028,421	17,251	-	123,168,666
Amortization for the year	1,145,691	4,733,609	317,920	8	-	6,197,228
Balance At December 31, 2020	27,149,495	96,852,799	5,346,341	17,259	-	129,365,894
Amortization for the year	1,101,238	4,687,872	314,297	7	-	6,103,414
Balance At December 31, 2021	28,250,733	101,540,671	5,660,638	17,266	-	135,469,308
<b>Net Book Value</b>						
At December 31, 2020	24,160,407	86,281,439	6,139,830	144	2,827,047	119,408,867
At December 31, 2021	23,287,240	87,454,524	6,117,750	137	3,679,034	120,538,685

# 2021 Annual Drinking Water Report

**PETERBOROUGH UTILITIES COMMISSION**  
**NOTES TO THE FINANCIAL STATEMENTS**  
**For The Year Ended December 31, 2021**

**7. ACCUMULATED SURPLUS**

Accumulated surplus consists of the following:

	2021 \$	2020 \$
Operating surplus	12,371,621	12,720,217
Investment in tangible capital assets		
Tangible capital assets - net book value	120,538,685	119,408,867
Long term debt	(13,173,275)	(14,216,370)
Reserve funds (Note 10)	11,211,680	10,313,858
	130,948,711	128,226,572

**8. CHANGE IN NON-CASH WORKING CAPITAL ITEMS AND OTHER INFORMATION**

	2021 \$	2020 \$
Accounts receivable	(134,277)	(292,775)
Unbilled revenue and sewer surcharge	-	(513,000)
Inventories	(81,464)	(104,200)
Prepaid expenses	-	291,424
Accounts payable and sewer surcharge payable	3,469,480	(98,148)
Customer deposits	(372,535)	88,896
	2,881,204	(627,803)
Other information:		
Interest paid	357,822	274,740

**9. BUDGET FIGURES**

The budget, approved by the Commission, for 2021 is reflected on the Statement of Operations and Accumulated Surplus and the Statement of Changes in Net Financial Assets. The budgets established for capital investment in tangible capital assets are on a project-oriented basis, the costs of which may be carried out over one or more years and, therefore may not be comparable with current year's actual amounts. Budget figures have been reclassified for the purposes of these financial statements to comply with Public Sector Accounting Board reporting requirements. Budget figures are not subject to audit.

# 2021 Annual Drinking Water Report

**PETERBOROUGH UTILITIES COMMISSION**  
**NOTES TO THE FINANCIAL STATEMENTS**  
**For The Year Ended December 31, 2021**

**10. RESERVE FUNDS**

	Budget 2021 \$ (Unaudited)	Actual 2021 \$	Actual 2020 \$
<b>TRANSFERS FROM OPERATIONS:</b>			
Sale of water	764,000	773,303	757,605
Development charges	1,437,000	831,010	58,942
Interest	87,000	74,211	93,598
Donations	25,000	51,877	4,603
	2,313,000	1,730,401	914,748
<b>TRANSFERS</b>			
For tangible capital assets	(1,437,000)	(832,579)	(59,289)
<b>CHANGE IN RESERVE FUNDS</b>	876,000	897,822	855,459
<b>OPENING RESERVE FUNDS</b>	10,173,000	10,313,858	9,458,399
<b>CLOSING RESERVE FUNDS</b>	11,049,000	11,211,680	10,313,858
<b>ANALYZED AS FOLLOWS:</b>			
<b>INTERNALLY RESTRICTED</b>			
Water treatment plant reserve fund	10,006,000	9,953,856	9,115,396
Park and zoo state of good repair reserve fund	107,000	104,394	103,674
	10,113,000	10,057,165	9,219,070
<b>EXTERNALLY RESTRICTED</b>			
Park and Zoo major projects reserve fund	660,000	660,697	604,410
Park and Zoo major animal care reserve fund	276,000	493,838	490,378
	936,000	1,154,515	1,094,788
	11,049,000	11,211,680	10,313,858



# 2021 Annual Drinking Water Report

**PETERBOROUGH UTILITIES COMMISSION**  
**NOTES TO THE FINANCIAL STATEMENTS**  
**For The Year Ended December 31, 2021**

**11. OPERATIONS FOR RIVERVIEW PARK AND ZOO**

	Budget 2021 \$ (Unaudited)	Actual 2021 \$	Actual 2020 \$
<b>EXPENSES</b>			
Maintenance park	592,000	474,436	408,137
Maintenance train	3,000	2,858	82
Animal care and zoo maintenance	994,000	1,268,424	1,270,110
	<b>1,589,000</b>	<b>1,745,718</b>	<b>1,678,329</b>
<b>REVENUES</b>			
Train	-	-	-
Miscellaneous	59,000	78,383	57,172
	<b>59,000</b>	<b>78,383</b>	<b>57,172</b>
<b>NET EXPENSES FOR THE YEAR</b>	<b>1,530,000</b>	<b>1,667,335</b>	<b>1,621,157</b>

**12. COVID-19**

On March 11, 2020, the World Health Organization categorized COVID-19 as a pandemic. The potential economic effects within the Commission's environment and in the global markets, possible disruption in supply chains, and measures being introduced at various levels of government to curtail the spread of the virus (such as travel restrictions, closures of non-essential municipal and private operations, imposition of quarantines and social distancing) could have a material impact on the Commission's operations. The extent of the impact of this outbreak and related containment measures on the Commission's operations cannot be reliably estimated at this time, and no amounts have been recorded in these financial statements.

# 2021 Annual Drinking Water Report

---

## **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 <sup>2</sup>	Square Meters
m <sup>3</sup>	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
PUC	Peterborough Utilities Commission
PUGSC	Peterborough Utilities Services Inc.
RP& Z	Riverview Park & Zoo
STS	Sodium thiosulphate
THM	Trihalomethane
TOC	Total Organic Carbon
µg/L	Microgram per Litre
UVA	Ultra Violet Absorbance
WTP	Water Treatment Plant

---