

Water Efficiency Strategy

2022 Progress Report



Environmental Services Department

As per the Accessibility for Ontarians with Disabilities Act (AODA), this document is available in an alternate format by e-mailing waterservices@guelph.ca or by calling 519-837-5627; TTY: 519-837-5688 or text 226-821-2132.

This page left intentionally blank.

Table of Contents

2022 Progress Report 0
 Table of Contents i
 List of Tables iii
 List of Figures iii
Background..... 1
Water Reduction Target Progress 1
Water Efficiency Incentive and Rebate Programs 3
Direct Water Savings Programs 5
 Residential Sector 5
 Royal Flush Toilet Rebate Program 5
 Blue Built Home Water Efficiency Standards and Rebate Program 5
 Water Use Home Visit and Audit Program 5
 Multi-Residential Sector 6
 Multi-Residential Water Audit Program 6
 Residential Sub-Water Meter Rebate Program..... 6
 All-Season Rainwater Harvesting Rebate Program 6
 Industrial, Commercial and Institutional Sector..... 6
 Water Smart Business Program 6
Municipal Operations 7
 Municipal Facility Water Efficiency Upgrades 7
Water Loss Management Program 7
 Water Loss Strategy 7
 Leak Detection Program 7
Indirect Water Savings Programs 8
 Peak Season Water Demand Management Initiatives 8
 Outside Water Use Program 8
 Healthy Landscapes 9
Public Outreach and Education Programs 9
 Curriculum-Linked Education Programming 9
 Water Related Events 10
Guelph Water Wagon 12
Research Programs 12
 Cooling Tower Research..... 12

**Water Efficiency Strategy
2022 Progress Report**

Water Softener, Alternatives, and Impact of Sodium Chlorides 12

List of Tables

Table 1: Water Efficiency Strategy Update Program Progress..... 4

List of Figures

Figure 1: Water Supply Master Plan (2014) and Water Efficiency Strategy (2016) Production Rates 2
Figure 2: Residential Water Use..... 3

Background

Water servicing capacity reclaimed through conservation and efficiency continues to be a top priority in achieving a sustainable and cost-effective community water supply. In July 2014, Guelph City Council endorsed the updated Water Supply Master Plan (WSMP). The WSMP established a new reduction target of 9,147 cubic metres in average daily production by 2038 to guide the City's water efficiency programming. The Council approved 2016 Water Efficiency Strategy (WES) defined programs, policies, and resources to help the City meet WSMP reduction targets.

The following sections outline the water efficiency and optimization goals achieved from the Water Efficiency Strategy between January 1 and December 31, 2022.

Water Reduction Target Progress

Building off the data analysis completed for the WSMP, the WES identified a ten-year water savings goal of 6,265 cubic metres per day between 2017 and 2026. The updated Strategy anticipates significant supply capacity can be reclaimed through water loss management and efficiencies realized within the industrial, commercial, and institutional sector.

Based on community uptake and participation in new and enhanced water efficiency programs, the total water savings achieved for 2022 was 100.4 cubic metres per day. Based on reductions in energy needed for water treatment and distribution, it is anticipated that 18.60 tonnes of greenhouse gas emissions and over \$9,000 in electricity costs will be avoided through this year's water savings. Since the implementation of the 2016 WES, the cumulative water savings achieved to date is 1,470 cubic metres per day.

Figure 1 presents the projected volumetric production values as presented in the 2014 Water Supply Master Plan and the 2016 Water Efficiency Strategy, as well as that of the actual average daily production. The City continues to experience lower average daily production volumes than those projected through the Water Supply Master Plan. This is due, in part, to the successful implementation of the 2009 WES and 2016 Water Conservation and Efficiency Strategy Update.

Figure 1: Water Supply Master Plan (2014) and Water Efficiency Strategy (2016) Production Rates

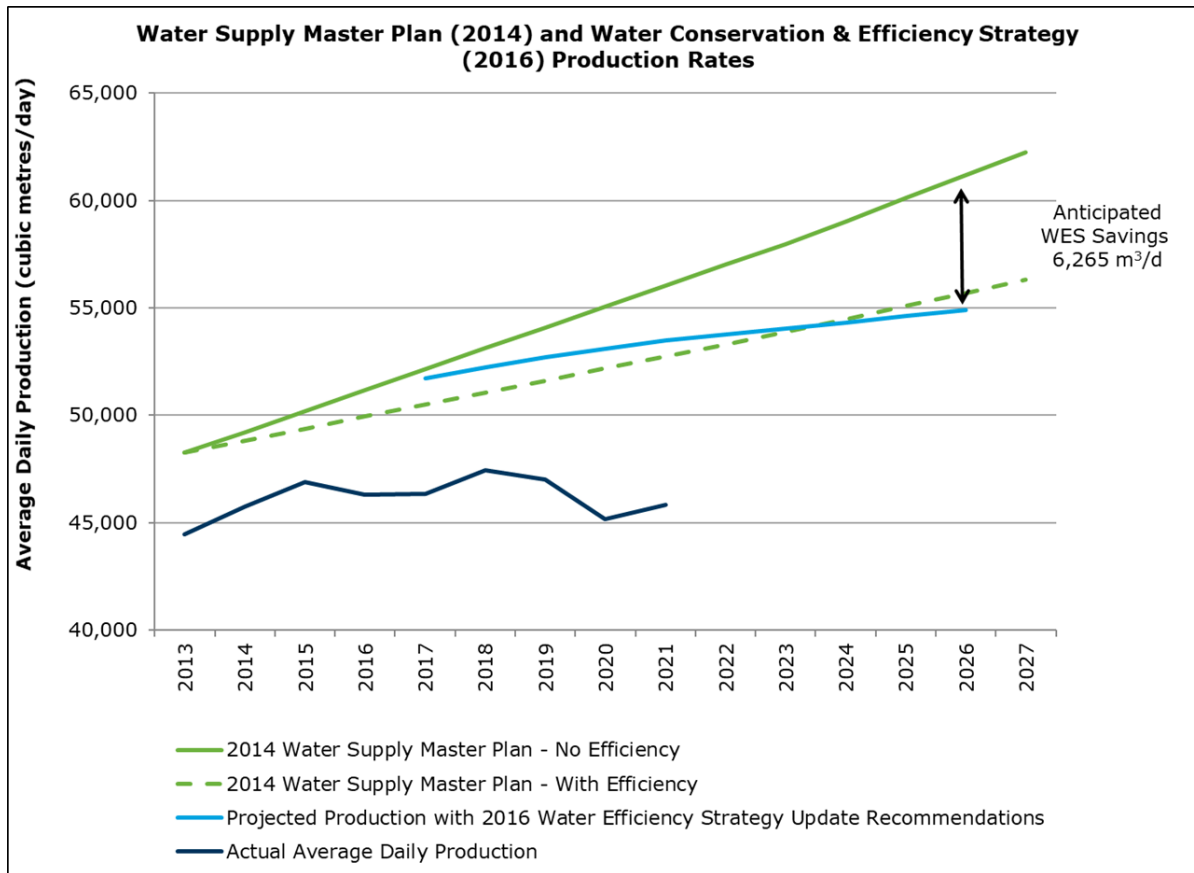
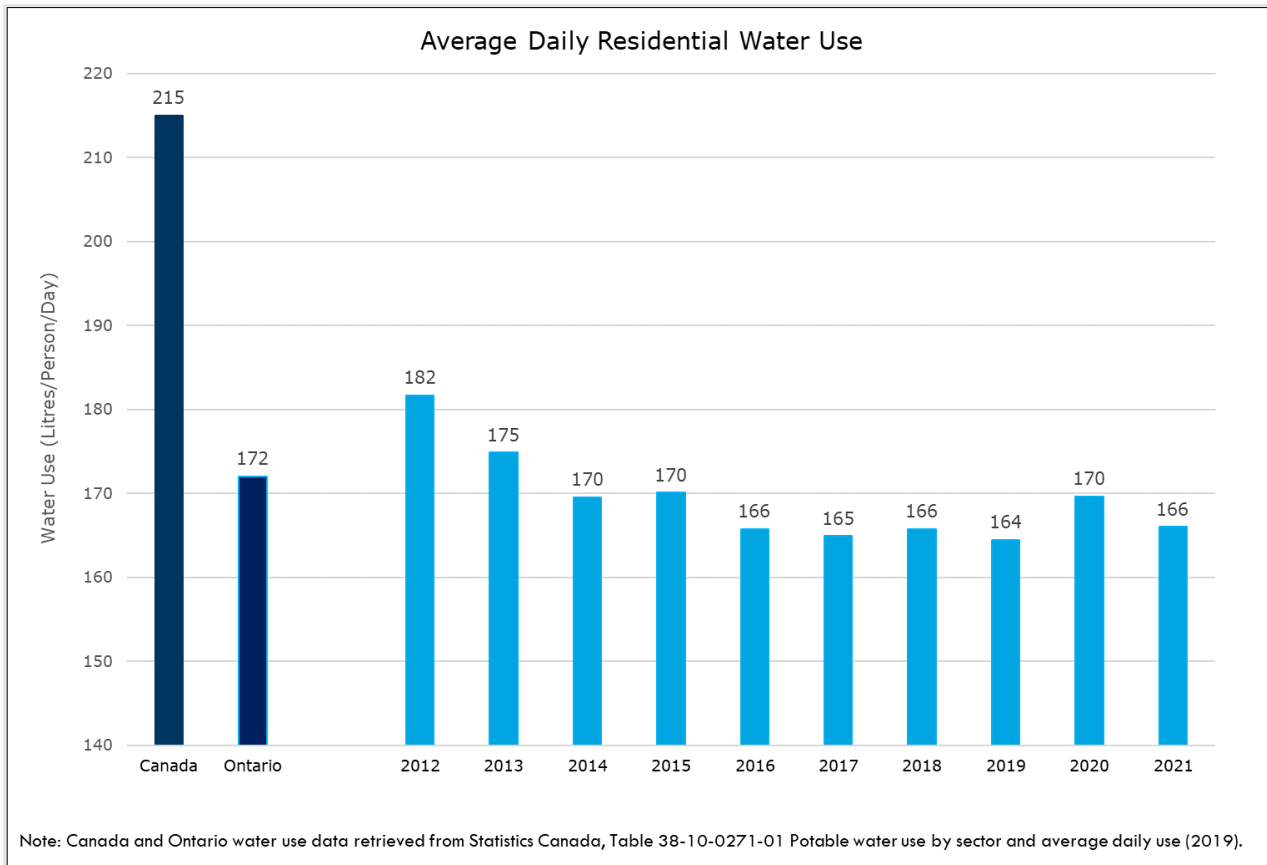


Figure 2 presents the City of Guelph's residential water use between 2012 and 2021, calculated using the volumetric consumption of water of all residential properties – low, medium, and high density. The City of Guelph's residential water use was largely declining, at an approximate rate of 3.1 litres less per person per day annually prior to 2020. Despite increased water use during the Covid pandemic and a growing population, average annual residential water reuse has maintained a steady trend around 166 litres per person per day.

Average daily residential water use in Guelph decreased in 2021 and remains below the provincial and national averages. In 2021, the average water use was 166 litres per person per day, whereas the most recently published average for Ontario is 172 and Canada is 215 litres per person per day. The increase in residential usage in 2020 was likely a result of the pandemic and associated Provincial restrictions. The City experienced a shift in residential consumption behaviour where the average resident spent more time in their home and used more water. The reduced water usage in 2021 suggests a return to a more normal state.

Figure 2: Residential Water Use



The following sections outline the individual program successes for 2022, as identified in the 2016 WES.

Water Efficiency Incentive and Rebate Programs

During 2022 programs achieved an estimated savings of 100.4 cubic metres per day. Although these savings fell approximately 84% short of the annual target (629 cubic metres per day) - challenges included numerous staffing gaps and transitions, and program activity reestablishment due to the COVID-19 pandemic - considerable progress towards achieving the 2016 WES targets was still made. For the period of 2017 to 2022 an estimated combined water savings of 1,470 cubic metres per day has been achieved.

In 2022, 561 rebate applications and audits were completed through the City’s residential rebate programs. An additional two incentives for business upgrades were processed and one significant facility upgrade resulting in water savings was completed. For more information on the individual water efficiency programs available, visit guelph.ca/rebates.

Table 1: Water Efficiency Strategy Update Program Progress

Water Efficiency Program	WES Target, 2022 Average Daily Water Savings (m³/day)	Achieved Average Daily Water Savings (m³/d), 2022	Number of Rebates/ Audits, 2022	WES Combined Target, 2017-2022: Average Daily Water Savings (m³/day)	Achieved Average Daily Water Savings (m³/day), 2017-2022	Number of Rebates/ Audits, 2017-2022
Royal Flush	20	17	449	150	147	3,779
Blue Built Home	1	0.25	9	11	9	44
Home Visits, Audit	n/a	7	75	65	28	854
Multi-Residential Audit	7	15	11	61	88	34
Residential Sub-metering	1	0	0	6	9	26
Water Smart Business	150	27	2	900	139	8
Municipal Facility Upgrades	22	0.15	1	132	38	6
Water Loss Management	428	34	14	1,861	1012	85
Totals	629	100.40	561	3186	1470	4836

Direct Water Savings Programs

Residential Sector

Individual residential sector program details can be found in the 2016 Water Efficiency Strategy section 13.1.1.1. The following is a 2022 summary of relevant updates, program achievements and challenges.

Royal Flush Toilet Rebate Program

The 2016 Water Efficiency Strategy continued with the Royal Flush Toilet Rebate program. The number of applications received in 2022 increased once again, with a total of 449 rebates processed. The program was promoted during in-home water audits, through social media posts, store locations and online outreach events. Participation rates and savings are summarized in Table 1.

Blue Built Home Water Efficiency Standards and Rebate Program

The 2016 Water Efficiency Strategy identified the Blue Built Home Program to achieve direct water savings. In 2022, the program was promoted through social media campaigns, presentations, and targeted outreach to specific groups (builders, contractors, City internal stakeholders and others). In total, nine residential single-family properties were certified as Blue Built Homes, which was nearly double the number of homes certified in 2021 (five). Together, single-family homes achieved a savings of only 0.25 cubic metres per day (89.68 cubic metres per year) in 2022, compared to the 0.68 cubic metres per day (250 cubic metres per year) in 2021. This was because most of the Blue Built Homes met the certification requirements without having to make any adjustments to water fixtures. No multi-residential buildings participated in 2022. Participation rates and savings are summarized in Table 1.

Water Use Home Visit and Audit Program

In 2022, the City contracted eMERGE Guelph Sustainability to conduct in-home water audits as part of the Water Use Home Visit and Audit Program. A total of 75 home visits were completed. This represents a combined water savings of 2632.10 cubic metres of water per year, equating to almost 28 cubic metres per day across all participating 2022 households. This was achieved through on-site replacement of faucet aerators and showerheads, toilet leak detection, and verification of other water-using fixtures such as toilets, dishwashers, and clothes washers. Participation rates and savings are summarized in Table 1.

Multi-Residential Sector

Individual multi-residential sector programs are detailed in the 2016 Water Efficiency Strategy section 13.1.1.2. The following is a summary of 2022 relevant updates, program achievements and challenges.

Multi-Residential Water Audit Program

This year the Multi-Residential Water Audit Program had ten participants. This was an increase from the previous year, likely due to the diminishing impact of the pandemic. The main findings from all audits performed in 2022 assumes a ten percent decrease in water use (as per the WES). This equates to 14.53 cubic metres of water per day that have been reclaimed through 2022 participation. This provides a combined water savings of 88.0 cubic metres per day since program launch in 2018. Participation rates and savings are summarized in Table 1.

Residential Sub-Water Meter Rebate Program

The residential sub-water meter program is open to all single and multi-family residential sectors in the City of Guelph.

In 2022, this program did not receive any applicants and therefore did not result in any water savings. Staff will be working to promote the program more widely in 2023 to engage residents to participate in the program. Participation rates and savings are summarized in Table 1.

All-Season Rainwater Harvesting Rebate Program

Rainwater harvesting plays an important role in water conservation and the All-Season Rainwater Harvesting Rebate programs seeks to encourage water reuse. In 2022, only one application was started to install an All-Season Rainwater Harvesting System, but it was not completed before year-end 2022. The rebate will be processed in 2023 and counted towards next year's water savings. Participation rates and savings are summarized in Table 1.

Industrial, Commercial and Institutional Sector

Industrial, commercial and institutional sector programs are detailed in the 2016 Water Efficiency Strategy section 13.1.1.3. The following is a summary of 2022 relevant updates, program achievements and challenges.

Water Smart Business Program

In 2022 the City's metering department initiated its automatic metering pilot (AMI) and leveraged the relationships that were built to aid in its expansion. Currently, seven businesses are participating in the AMI pilot. In 2022, two program participants completed the program accounting for 9,881 cubic metres of water savings per year – or 27.1 cubic

metres per day. These savings were achieved through a complete facility fixture retrofit. Participation rates and savings are summarized in Table 1.

Municipal Operations

Details of municipal operation initiatives can be found in the 2016 Water Efficiency Strategy section 13.1.1.4. The following is a 2022 summary of relevant updates, program achievements and challenges.

Municipal Facility Water Efficiency Upgrades

In support of the City's Strategic Plan, the City continues to lead by example with water efficiency in its own facilities. Projects undertaken include washroom renovations at 45 Municipal Street and Fire Station renovations (including dorms and kitchens) with WaterSense certified fixtures. A recirculation system at Hanlon Creek Splash Pad was completed in 2022 resulting in 0.15 cubic metres of water saved per day. Additionally, the City actively repaired leaking infrastructure in line with best practices.

Water Loss Management Program

Water Loss Strategy

The Water Loss Strategy continued in 2022. The City's work to date in minimizing non-revenue water has shown continuous improvement. The data now indicates that further attempts at reductions may not be economically feasible for the City. Locating and fixing a potential leak may cost more than the water lost to the leak itself. The 2020 consultant's review indicated that if the City wants to further reduce non-revenue water and have its efforts remain cost effective then an additional expenditure between \$97,000 to \$116,000/year should not be exceeded. Additional options to limit non-revenue water suggested by the consultant will be explored in greater detail in the Water Efficiency Strategy Update to be completed in 2023.

Leak Detection Program

The City's leak detection program started in the spring of 2011 and aims to reduce the amount of water lost between the point of treatment and delivery to customers. The 2022 Leak Detection Program included sounding and correlation of all 558 kilometers of watermains within the City's distribution system. In total, fourteen possible leaks were identified through this survey, including two main breaks and the rest consisting of hydrant, service, or valve repair/replacements. The average daily volume of servicing capacity reclaimed through the location and remediation of these leaks equate to approximately 33.89 cubic metres per day in 2022. The reduction in water savings reflects a successful water loss management program and the need for fewer excavations to manage significant

leaks. Only two of the fourteen suspected leaks required excavation to repair. Savings attributed to reclaimed water supply capacity (production) are summarized in Table 1.

Indirect Water Savings Programs

Education is a fundamentally important tool to engage and motivate action. The commitment to increasing local water literacy is a complimentary piece to changing toilets, completing water audits, and installing water meters to ensure wise resource use. The City continues to offer a variety of successful programs to increase awareness about and influence attitudes and habits regarding water use, as well as inform the public on how the City invests their rate dollars. Investment in Guelph's water future includes education and outreach programming. A summary of the individual indirect water savings programs can be found in the 2016 Water Efficiency Strategy section 13.1.2. The following is a 2022 summary of relevant updates, program achievements and challenges.

Peak Season Water Demand Management Initiatives

Reduction of peak season (summer) water demand continues to be a primary objective of the City's water efficiency programming. The ability to reduce or minimize variations in seasonal water use limits the impact on finite groundwater supply during times of environmental stress and creates operational efficiencies.

Outside water use initiatives that result in indirect savings are detailed in the 2016 Water Efficiency Strategy section 13.1.2.1. The following is a 2022 summary of relevant updates, program achievements and challenges.

Outside Water Use Program

This program is driven by the City's Outside Water Use Bylaw – which restricts certain outdoor water-using activities during peak demand, when conditions such as dry, hot weather and river flows warrant restrictions.

The Outside Water Use Program ran between April and October 2022 and experienced a fluctuation in level changes throughout the season.

The OWUP went through three level changes this season. The change from Level 0 Blue to Level 1 Yellow was announced on June 22. The change from Level 1 Yellow to Level 2 Red was announced on July 13. The change from Level 2 Red back to Level 1 Yellow was on August 31.

Internal and public condition reports were distributed via email and on the website.

Media advertisements included: radio ads, newspaper ads, Facebook, Twitter, and the road signs around the city to notify residents about the current water level. Permits were still being issued through the watering ban and no permits were suspended. In the season, 211 permits were issued:

- 129 new lawn watering permits;
- 67 treated lawn watering permits;
- 15 time shift permits.

Due to the ongoing pandemic, the annual rain barrel sale was moved to an online ordering and delivery service. In partnership with Stormwater Engineering, 500 rain barrels were sold to Guelph residents in 2022. An additional 36 rain barrels were purchased and distributed to City facilities and community gardens. Rain barrels capture rain water for reuse in gardens.

Healthy Landscapes

The Healthy Landscapes Program continues to offer various resources to residents on preferred landscape management tools and techniques that result in desired yard aesthetics and reduced impact on water resources.

The annual Healthy Landscapes Speaker Series featured five virtual talks on outdoor water conservation topics including efficient landscape design, plant selection, and proactive maintenance best practices to manage the impact of drought and common turf pests. There were over 2,418 participants in the 2022 speaker series, and a further 960 participants in the annual three-part Landscape Design Course.

Healthy Landscape Visits continue to be a popular resource, with 399 complimentary one-hour visits completed by trained staff this year; 82 Healthy Landscape visits were completed to support residents in achieving their Blue Built Home credentials in 2022. For more information on the Healthy Landscapes Program, visit guelph.ca/healthylandscapes.

Public Outreach and Education Programs

Public outreach and education program initiatives are detailed in the 2016 Water Efficiency Strategy section 13.1.2.2. The following is a 2022 summary of relevant updates, program achievements or challenges.

Curriculum-Linked Education Programming

The City's curriculum-based Grade 2 and Grade 8 in-class, water and wastewater programming continues to be a popular resource for local educators in both the Upper Grand District School Board and the Wellington Catholic District School Board. After a pivot to virtual programming necessitated by the pandemic, staff returned to classrooms in

September of 2022. In total, 78 school presentations were delivered and 1,589 students were engaged.

In 2022, staff also returned to delivering facility tours at the F.M. Woods Water Treatment Plant and the Water Resource Recovery Centre. In 2022, 12 tours of water services and 11 tours of wastewater services were delivered.

Water Related Events

A variety of outreach and education events are coordinated throughout the year to raise awareness about water efficiency. Due to the ongoing pandemic in early 2022, events were adapted to a virtual format or to locations that met public health guidelines. These events included:

Fix-A-Leak – Events were organized at various locations across the city to engage the community in discussion about household leaks and water conservation. Leak detection kits and conservation related swag were distributed to participants. In 2022 over 130 people were engaged in Fix-A-Leak events.

Wacky Water Week – A combination of in-person and self-directed activities were organized to engage the public. Over 80 participants were engaged in activities at the library's main branch, and over 800 participants engaged in the self-directed Water Bingo Cards (distributed by the local libraries) and Water Hero Wander activity, where participants were encouraged to walk one of four trails in Guelph in search of six posted signs linked to water conservation, stormwater, wastewater, source water protection, and tap water promotion.

H2Awesome – 10 guest speakers delivered virtual talks on water conservation over the course of four weeks from World Water Day (March 22) to Earth Day (April 22). This virtual speaker series attracted over 2,200 students.

Water Resource Recovery Centre Open House – The City hosted a public event on April 23 for Earth Day to engage the public about wastewater. The event featured tours, interactive displays, games, and the promotion of City programs. The open house attracted over 400 participants.

Public Works Open House – The public participated in interactive displays and conversations related to water and wastewater services at this event. There were 400 attendees at the event.

Waterloo-Wellington Children's Groundwater Festival – In 2022 the festival opted to run virtually for the second year in a row. The event featured water related activities and

experiments that could be carried out in-class or at home. It also included a host of speakers discussing the importance of water and wastewater treatment, source water protection and conservation in our daily lives. In total, the virtual festival attracted more than 10,000 participants across Waterloo and Wellington regions, with over 800 participants from Guelph.

Imagine a Day Without Water – In 2022, staff participated in this North American wide campaign aimed to draw attention to the influence of water, wastewater and stormwater as individuals, a community and globally. Local students were invited to participate in a poster contest, and submit original art linked to water. The contest received over 55 submissions, and the winning submissions were posted in the City’s libraries and community centres.

Library STEM events – A pilot series of STEM events were organized at the Guelph Public Library. The events included interactive displays to engage participants in understanding processes related to water, wastewater, and stormwater. The series of events attracted 40 participants.

EcoMarket and Electric Vehicle Show – This annual event attracts over 5,000 people each year looking for ways to fight climate change, reduce their impact on the environment and save money. In the spirit of the *One City, One voice. Shared purpose. five-year plan*, staff from Water, Wastewater, Solid Waste, Stormwater, Sustainable Transportation and Energy and Climate Change, came together under one City of Guelph booth to provide a one-stop-shop to learn more about the City’s programs and services that help us meet the Race to Zero targets. Staff engaged in meaningful conversations about City services and programs with over 300 individuals.

Speaking engagements:

- Stormwater Management and Rainwater Harvesting Webinar – A webinar was organized in partnership with eMERGE to promote the City’s rainwater harvesting programs and associated rebates. There were 35 attendees.
- Orientation to Ontario Webinar – A webinar was delivered to new residents of Guelph through a partnership with Immigrant Services Guelph-Wellington. The webinar engaged 15 people and introduced the City’s water, wastewater, and solid waste services.
- Circular Water and Sanitation Webinar – A webinar was organized on Guelph's Rainwater and Greywater programs and related rebates, as part of the ICLEI Global Webinar Series. There were 25 attendees for this presentation.

Guelph Water Wagon

In support of the City's 2009 Public Promotion Action Plan for City Drinking Water Consumption, the Guelph Water Wagon has been providing tap water to attendees of large, outdoor community events during the summer months for eight years.

The Water Wagon service resumed in 2022, after having been put on hold in 2021 due to large gathering restrictions related to the pandemic. Staff attended 22 events, providing 22,970 litres of water to the public. As a result of offering this service, 45,940 500ml plastic water bottles were diverted from waste streams.

Research Programs

Planned research details can be found in the 2016 Water Efficiency Strategy section 13.1.3. The following is a 2022 summary of relevant updates, program achievements or challenges.

Cooling Tower Research

The Alliance for Water Efficiency commenced a multi-year Cooling Tower Research project in 2018, in partnership with 13 municipalities and utilities from across North America. The overall purpose of this study is to gain foundational knowledge needed to create an effective, targeted, and appealing incentive and outreach program to achieve greater efficiency in industrial cooling systems. The results of this research will provide the framework for the WES-proposed cooling tower audit and rebate program. 2022 saw the final release of the Cooling Tower Resources and Tools, including the Cooling Tower Estimating Model (an Excel based tool), Cooling Tower Audit Tool and Return on Investment Calculator, and a Project Summary Report. This completed research and resources will inform the upcoming WES update.

Water Softener, Alternatives, and Impact of Sodium Chlorides

Internally, staff participated in a working group convened by the local Source Water Protection program. The aim was to develop a sodium and chloride monitoring program to better understand the water quality trends and potential impacts to the local drinking water system. In 2022, the Salt Management Action Plan working group formed four subcommittee working groups to focus on data collection, alignment, a review of the City's Salt Management Strategy and public education and outreach initiatives. Subcommittee plans will be initiated in 2023, including efforts to educate and mitigate sodium and chloride-contributing activities to source water such as: sewage systems; snow storage; residential and commercial softening equipment; and the application, handling, and storage of road salt.