

# Water Efficiency Strategy

## 2023 Progress Report



### Environmental Services Department

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# Water Efficiency Strategy 2023 Progress Report

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## **Background**

Water servicing capacity reclaimed through conservation and efficiency continues to be a priority in achieving a sustainable and cost-effective community water supply. In 2014, Guelph City Council endorsed the updated Water Supply Master Plan (WSMP). The 2014 WSMP established a reduction target of 9,147 cubic metres in average daily production by 2038 to guide the City's water efficiency programming. 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, 2023.

## **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 Strategy anticipated significant supply capacity to be reclaimed through water loss management and efficiencies realized within the industrial, commercial and institutional sector.

Based on community uptake and participation in direct-savings water efficiency programs, the total water savings achieved for 2023 was 84.79 cubic metres per day. Since the implementation of the 2016 WES, the cumulative water savings achieved to date is 2,258.92 cubic metres per day (2017-2023). However, water production values achieved over this same period illustrate potential indirect savings. These indirect savings can be associated with reclaimed loss due to leaks (infrastructure and private side) and adherence to the City's Outdoor Water Use Program.

Based on reductions in energy needed for water treatment and distribution, it is anticipated that 0.63 tonnes of greenhouse gas (GHG) emissions and over \$2,500 in electricity costs will be avoided through this year's water savings, year-over-year. The 2023 GHG emissions are significantly lower than previous years due to a change in reporting methodology. The methodology used in the WES have been updated to apply the calculation standard used corporately, established by Facilities and Energy Management – Energy and Climate Change to ensure consistency.

Figure 1 presents the daily average volumetric production values as projected in the 2014 WSMP, 2016 WES, and actual production. The City continues to experience lower average daily production volumes than those projected through the WSMP. This is due, in part, to the successful implementation of the 2016 WES.

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

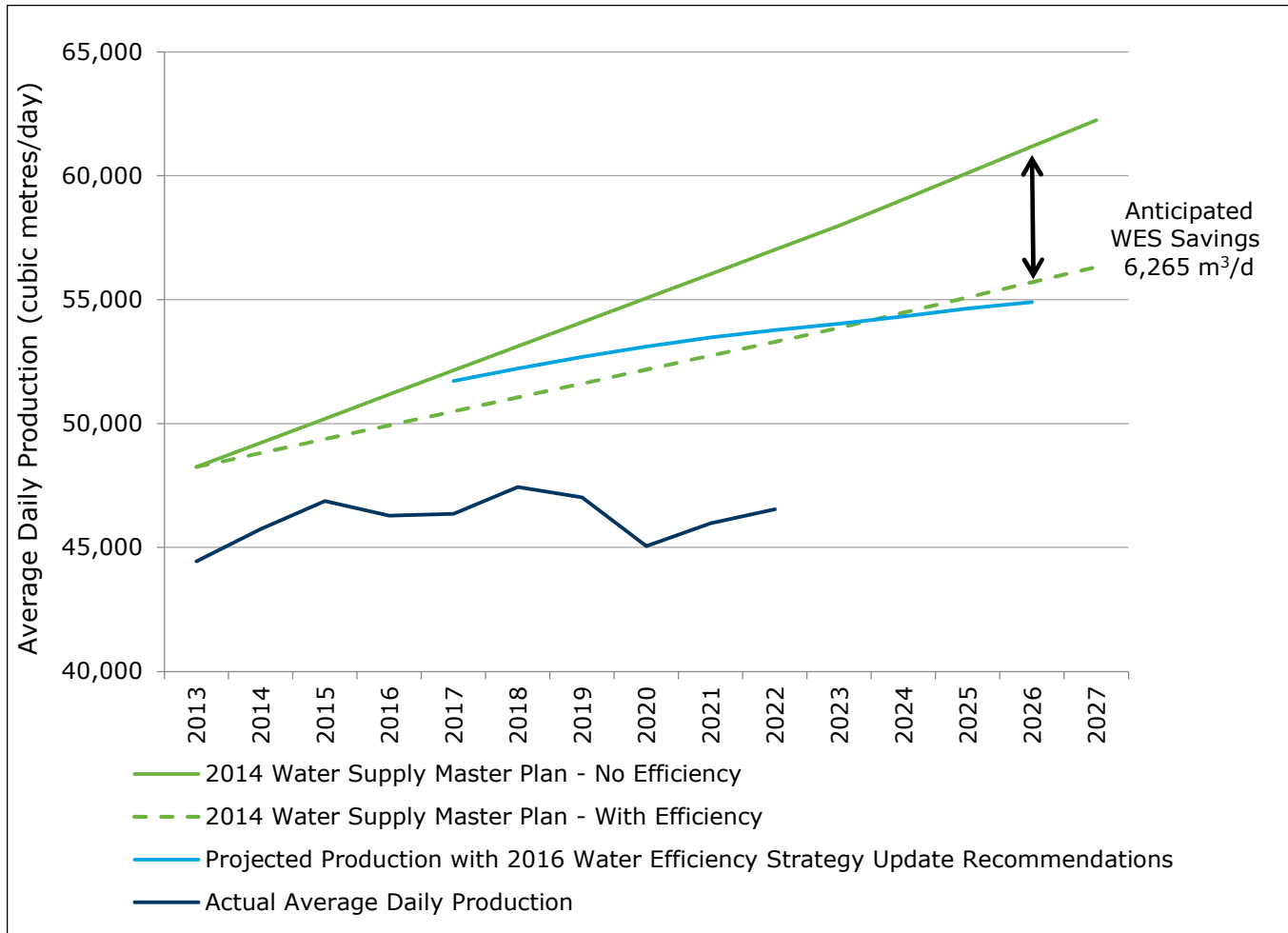
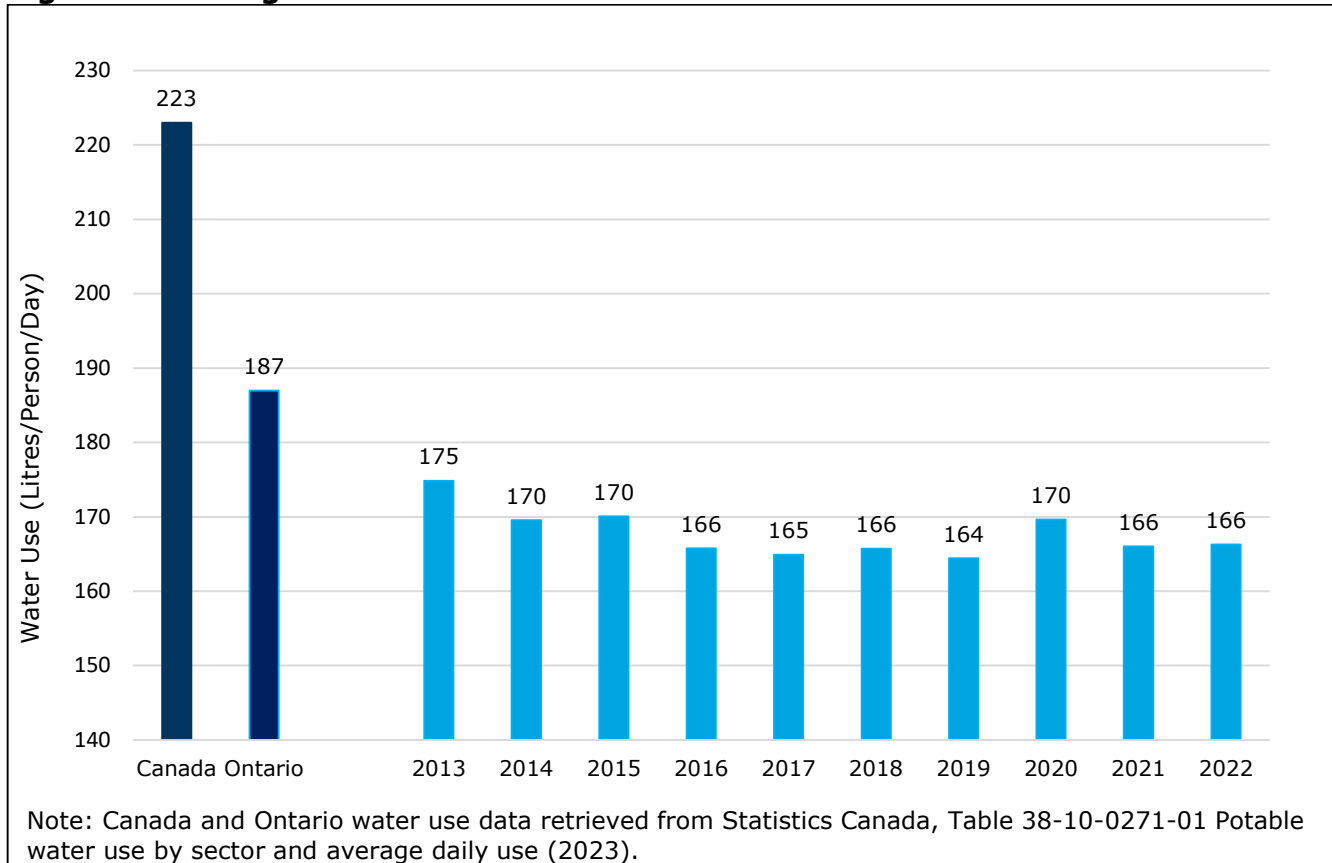


Figure 2 presents the City of Guelph's average residential water use between 2013 and 2022, calculated using the volumetric consumption of water of all residential properties – low, medium and high density. The City of Guelph's residential water use was largely declining, at an approximate rate of 3.1 litres less per person per day annually prior to 2020. Despite increased water use during the COVID pandemic and a growing population, Guelph continues to remain below provincial and national averages of 187 and 223 litres per person per day, maintaining a steady trend of approximately 166 litres per person per day (2022). Consumption values are not yet reportable to year end 2023 and are not included at this time.

**Figure 2: Average Residential Water Use**



The following sections outline the individual program successes for 2023, as identified in the 2016 WES.

## **Water Efficiency Incentive and Rebate Programs**

During 2023, participation in direct water savings programs achieved an estimated savings of 84.79 cubic metres per day. These savings fell approximately 88% short of the annual target (674 cubic metres per day). Challenges included staffing gaps and transitions and continuing to reestablish and adapt programs post-pandemic. For the period of 2017 to 2023 an estimated combined water savings of 2,258.92 cubic metres per day has been achieved.

In 2023, 632 residential rebate applications and water audits were completed, and three business water audits were completed. For more information on the individual water efficiency programs available, visit [guelph.ca/rebates](http://guelph.ca/rebates).

**Table 1: Water Efficiency Strategy Update Program Progress**

<b>Water Efficiency Program</b>	<b>WES Target, 2023 Average Daily Water Savings (m<sup>3</sup>/day)</b>	<b>Achieved Average Daily Water Savings (m<sup>3</sup>/d), 2023</b>	<b>Number of Rebates/Audits, 2023</b>	<b>WES Combined Target, 2017-2023: Average Daily Water Savings (m<sup>3</sup>/day)</b>	<b>Achieved Average Daily Water Savings (m<sup>3</sup>/day), 2017-2023</b>	<b>Number of Rebates/Audits, 2017-2023</b>
Royal Flush	18	21.39	560	168	166.03	4,339
Blue Built Home	1	1.30	5	15	12.93	49
Home Visit/Audit	N/A	1.13	15	65	30.23	869
Multi-Residential Audit	7	18.60	9	66	106.64	42
Residential Sub-Water Meter	1	0.00	0	7	9.20	26
Water Smart Business	150	0.00	3	1,050	138.52	11
Municipal Facility Upgrades	22	2.18	5	154	40.27	11
Water Loss Management	475	40.19	35	2,336	1,755.10	120
<b>Totals</b>	<b>674</b>	<b>84.79</b>	<b>632</b>	<b>3,861</b>	<b>2,258.92</b>	<b>5,467</b>



## **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 2023 summary of relevant updates, program achievements and challenges.

#### **Royal Flush Toilet Rebate Program**

The 2016 WES recommended continuing with this rebate program to replace older, inefficient toilets. In 2023 the number of applications increased again, with a total of 560 rebates processed. The program was promoted during in-home water audits, through social media campaigns, store locations and outreach events. Participation rates and savings are summarized in Table 1.

#### **Blue Built Home Water Efficiency Standards and Rebate Program**

The 2016 WES identified the Blue Built Home Program to reduce indoor water demand through water saving fixtures and appliances in both existing and new homes, and multi-residential buildings. In 2023, four single family homes and one small (six-unit) multi-residential property were certified as Blue Built Home. Two of the homes met the certification requirements without having to make any adjustments to water fixtures or appliances. Three participated in the City's rebate programs to meet the certification, including two that qualified for the all-season rainwater harvesting rebate program. The program was promoted through follow-up emails to participants in the water use home visits. Participation rates and savings are summarized in Table 1.

#### **All-Season Rainwater Harvesting Rebate Program**

The All-Season Rainwater Harvesting Rebate programs seeks to encourage water reuse to reduce demand on drinking water supply for non-potable uses in a home or business. In 2023 two applications were approved. These projects qualified for Blue Built Home certification and the estimated daily water savings are summarized under that program in Table 1.

#### **Water Use Home Visit and Audit Program**

In 2023, the City contracted Greenbrain Inc. to conduct in-home water audits as part of the Water Use Home Visit and Audit Program. A total of 15 home visits were completed. This represents an average water savings of 1.13 cubic metre per day for 2023 and an overall program average water savings of 30.23 cubic metres per day since 2017. This was achieved through the identification and potential replacement of leaking and/or inefficient faucet aerators, showerheads and toilets, and verification of other water-using fixtures such as hot water distribution systems, dishwashers and washing machines. 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 2023 relevant updates, program achievements and challenges.

### **Multi-Residential Audit Program**

In 2023, the City contracted Reep Green Solutions to conduct detailed water audits of multi-residential buildings. A total of nine buildings participated in the program and received a detailed report on daily water demand patterns, presence of leaks, and potential water-saving opportunities (e.g. replacing inefficient plumbing fixtures or other water using processes like water softeners). As outlined in the WES, there is an assumed ten per cent reduction in daily water use following an audit. For 2023, this equates to 18.60 cubic metres of water per day. This provides a combined water savings of 106.64 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 rebate program is open to single and multi-family residential sectors in the City of Guelph. In 2023, this program did not receive any applicants and therefore did not result in any water savings. Staff will promote the program more widely in 2024 and explore different ways to engage residents, landlords and multi-residential managers in the program. 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 2023 relevant updates, program achievements and challenges.

### **Water Smart Business Program**

The Water Smart Business Program continues to offer various resources to businesses on preferred water management tools and efficiency techniques that result in a lower utility spend (water consumption) and reduced impact on water resources.

The annual speaker series featured three virtual talks on business efficiencies with topics including geothermal systems, low-cost water efficiency solutions, and using data intelligence to optimize water use. There were over 30 participants in the 2023 speaker series. Three businesses participated in the Water Smart Business program, completing water audits that identified water savings projects to be completed in the future. While no direct savings are reported, the audits identified 18 cubic metres of water per day attributing to leaks. The identified leaks were

resolved by the businesses. 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 2023 summary of relevant updates, program achievements and challenges.

### **Municipal Facility Water Efficiency Upgrades**

The City continues to lead by example with water efficiency in its own facilities. Washrooms at four facilities (Centennial Arena, Exhibition Arena, Woods Pumping Station and River Run Centre) were retrofitted with WaterSense certified showerheads. This resulted in 2.18 cubic metres of water saved per day. In addition, an irrigation controller at Lyon Park was upgraded, annually resulting in 0.10 cubic metres of water saved per day. The system is used during the summer season (May through September). Additionally, the City actively repaired leaking infrastructure in line with best practices.

## **Water Loss Management Program**

### **Water Loss Strategy**

The implementation of Guelph's Water Loss Strategy continued in 2023. The City's work to date in minimizing non-revenue water has shown continuous improvement. With a low infrastructure leakage index at 1.4 – approaching a theoretical lower limit - the data now indicates that further attempts (i.e. expansions in the program) 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. A 2020 consultant's review indicated that if the City wants to further reduce non-revenue water and have its efforts remain cost effective than an additional expenditure between \$97,000 to \$116,000/year should not be exceeded.

### **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 2023 Leak Detection Program included sounding and correlation of all watermains within the City's distribution system. In total, 35 possible leaks were identified through this survey. The average daily volume of servicing capacity reclaimed through the location and remediation of these leaks equate to approximately 40.19 cubic metres per day in 2023. The reduction in water savings reflects a successful water loss management program and the need for fewer excavations to manage significant leaks. 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 2023 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 2023 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 (OWUP) ran between April and October 2023 and experienced a fluctuation in level changes throughout the season.

The OWUP went through two level changes this season. The change from Level 0 Blue to Level 1 Yellow was announced on June 7 and the change from Level 1 Yellow back to Level 0 Blue occurred on August 2.

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

Media advertisements included radio 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 season and no permits were suspended.

In the season, 99 permits were issued:

- 65 new lawn watering permits;
- 0 treated lawn watering permits;
- 34 time shift permits.

## **Healthy Landscapes Program**

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 speaker series featured five virtual talks on outdoor water conservation topics including sustainable landscaping, plant selection, healthy lawn care, and best practices to manage the impact of drought and common landscape pests. This had cross benefits to managing yard waste and yard waste reduction – a benefit to the City’s waste management public programming. There were over 1,095 participants in the 2023 speaker series, and a further 180 participants in the three-part Landscape Vegetable Garden Design Course. In partnership with the Guelph Turfgrass Institute, a Lawn Science Day was delivered in the fall of 2023. Twenty five (25) attendees experienced a hands-on and interactive seminar on lawn care maintenance. Healthy Landscape Visits continued to be a popular resource, with 216 complimentary one-hour visits completed by trained staff this year. For more information on the Healthy Landscapes Program, visit [guelph.ca/healthylandscapes](http://guelph.ca/healthylandscapes).

The annual rain barrel sale was offered again as an online ordering and delivery service. In partnership with Stormwater Engineering, 600 rain barrels were sold to Guelph residents in 2023. An additional 30 rain barrels were purchased and distributed to City facilities and community gardens. Rain barrels capture rainwater for reuse in gardens and assist in abating pressure on stormwater infrastructure during rain events.

## **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 2023 summary of relevant updates, program achievements or challenges.

### **Curriculum-Linked Education Programming**

**School presentations** - The Grade 2 and Grade 8 programs on water and wastewater (including source protection messaging) continues to be a popular resource for local schools. After a pivot to virtual programs necessitated by the pandemic, staff have returned to classrooms. In 2023, 38 school presentations were delivered and 1,418 students were engaged.

**Facility tours** - Guided tours of the F.M. Woods Water Treatment Plant and the Water Resource Recovery Centre provided students the opportunity to see first-hand where their water comes from and what happens when it goes down the drain. In 2023, 20 water facility tours and 26 wastewater facility tours were delivered and 700 students in Grades 5 to 12 were engaged.

**Guest speaker events** - In collaboration with the local school boards, guest speaker events focused on water and wastewater were organized for students in

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Grades 6 to 8. For the H2Awesome Conference, four guest speaker sessions were planned under the theme of “Watershed Moments” between World Water Day (March 22) and Earth Day (April 22). This virtual event engaged over 1,625 students. In 2023 the City acknowledged World Toilet Day; a day observed by the UN on November 19 to raise awareness of the global sanitation crisis. A virtual speaker session was hosted on November 16, engaging over 400 students in the live event, and hundreds more in the days following the event who accessed the recording.

**Waterloo-Wellington Children’s Groundwater Festival** – The City once again supported this successful annual event. In 2023 the festival returned to an in-person format and was held at Guelph Lake Conservation Area. Over 4,000 students in Grades 2 to 5 and teachers participated in various water-related activities from June 6 to 9, with 1,300 of the participants from Guelph schools. The activity stations covered a variety of topics from water and wastewater treatment to source water protection and conservation.

### **Public Outreach Events**

A variety of outreach events were coordinated throughout the year to raise awareness about water conservation and efficiency. While some events continue to be delivered virtually, regular in-person programming has resumed in 2023. These events included:

**Fix-A-Leak Week** – A combination of in-person and self-directed activities were organized to engage the public in discussions about household leaks and water conservation. Over 500 participants were engaged at public libraries, University of Guelph, Stone Road Mall, and Old Quebec St Mall (before a Guelph Storm Game). Leak detection kits and conservation-related promotional material were distributed. Additionally, over 800 people engaged in the self-directed Water Bingo Cards distributed by local libraries, and the 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.

**Girl Guides and Scouts Badge Program** – In 2023 staff developed a badge program for community groups such as Girl Guides and Scouts. Water, wastewater and solid waste badges were developed along with engaging activities. To earn the badge for each service area, youth participated in a facility tour and completed the follow-up activity. One program was piloted in February and 15 youth and leaders were engaged.

**Summer Camp Programming** – In 2023 staff collaborated with Culture and Recreation Services to pilot summer camp activities related to water, wastewater and solid waste. Campers had the opportunity to learn about water treatment, distribution and conservation by participating in interactive games and activities. A total of 8 programs were delivered and 314 youth were engaged.

**Public Works Week Open House** – On May 27 the public had the opportunity to learn more about the City’s water and wastewater services through interactive displays and conversations. Over 300 people attended the event and engaged with displays related to metering, locates, source water protection, water treatment and distribution, wastewater collections and treatment, environmental protection, water conservation and drinking water promotion.

**EcoMarket** – 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.

**World Toilet Day** – A public outreach event was organized at a local hardware store to promote the Royal Flush toilet rebate and the City’s other water rebate programs. There was significant interest in the programs, especially the free in-home water audits.

**Speaking engagements** - *Orientation to Ontario* information sessions were delivered to new residents of Guelph through a partnership with Immigrant Services Guelph-Wellington. The presentations engaged 7 and 15 people in the spring and fall presentations respectively, introducing the City’s water, wastewater and solid waste services.

### **Drinking Water Promotion**

In support of the City’s 2009 Public Promotion Action Plan for City Drinking Water Consumption, the Guelph Water Wagon provides tap water to attendees of large, outdoor community events during the spring and summer months.

The Water Wagon service returned to pre-2020 levels in 2023. Staff attended 28 events, providing 15,290 litres of water to the public. As a result of offering this service, 30,580 500-millilitre-sized plastic water bottles were diverted from waste streams.

### **Research Programs**

#### **Drought Response Operation Plan (DROP)**

In 2023, the City retained AECOM Canada Ltd. to prepare a Drought Response Operational Plan (DROP). The purpose of the DROP is to manage the impacts of drought on the City’s water supply by identifying indices with associated thresholds and triggers for increasing levels of drought severity and outlining increasing levels of action for the City to take at each level.

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A drought is a prolonged period of abnormally low precipitation, potentially leading to diminished groundwater levels. The lack of adequate precipitation, either rain or snow, can cause reduced soil moisture, reductions in groundwater storage, diminished stream flow, crop damage, and a general water shortage.

The Drought Response Operational Plan (DROP) describes management of water shortages over extended periods for the City of Guelph. The DROP relied on the Tier 3 modelling data to establish triggers and planning tool recommendations to evaluate and lessen the impact of extended drought-like conditions on our water supply. The DROP outlines many recommendations and new triggers that will be piloted in 2024 as part of the Outside Water Use Program.

### **Environmental Programs Framework**

In 2023, the City contracted KPMG to develop an Environmental Programs Framework. The goal is to evaluate all programs delivered by Environmental Programs staff across the disciplines of water efficiency, source water protection, tap water promotion, wastewater and solid waste. The Framework will provide a tool to assess the various programs in a standard way, looking at dimensions that include value, efficacy, reach and tracking. This will help determine program alignment with goals of the Water Efficiency Strategy (and other service area strategies), and the City's Strategic Plan, and identify opportunities for collaboration, shared processes and resources to meet individual and shared program goals more effectively and efficiently. Completion of the Framework is expected by end of Q1, 2024.