



Staff Report

Operations – Water & Wastewater Services

Report To: COW-Operations, Planning and Development Services
Meeting Date: June 27, 2023
Report Number: CSOPS.23.041
Title: 2022 Year End Water and Wastewater Capacity Assessment
Prepared by: Allison Kershaw, Manager of Water & Wastewater Services

A. Recommendations

THAT Council receive Staff Report CSOPS.23.041, entitled “2022 Year End Water and Wastewater Capacity Assessment” for their information.

B. Overview

The Town’s Year End Water and Wastewater Capacity Assessment is submitted to Grey County to provide status of the connections to the Town’s Water Distribution System and Wastewater Collection Systems. The report also provides information on the capacity status of the Water Treatment Plant, the Thornbury & Craigeith Wastewater Treatment Plants and related critical infrastructure.

C. Background

The Town is required to provide an annual Year End Water & Wastewater Capacity Assessment Report to the upper tier government, being the Grey County Planning Department. This report is used as a monitoring tool for the provision of allocation and reservation of water and wastewater capacity for new development. It also provides current information on flows from existing system users.

The Year End Water and Wastewater Capacity Assessment is prepared by Town Staff.

D. Analysis

An overview of the 2022 Year End Water and Wastewater Capacity Assessment is provided below, the Executive Summary is provided in Attachment #1.

Section D1.4 of the Official Plan describes five development-staging categories based on development approval status and corresponding level of commitment of the water or the wastewater system capacity. The process makes commitment of capacity for existing unserved development. Attachment #2 provides an overview of the development staging

process and requirements for moving through the process both new and existing unserved development is identified as having “No Capacity”, “Reservation”, or “Allocation” depending on the stage.

Development Categories

The Town’s Year End Reports have historically identified 7 categories of connection status within the Town. See Attachment #2.

1. Connected – includes all connected units
2. Can connect – Includes all existing units and vacant lots fronting servicing that are not connected
3. Committed – includes all new units that are identified in an executed development agreement
4. Not Fronting, Not Services – Includes exiting units and vacant lots within a service area that do not front servicing
5. Designated active lands- Includes units in areas with draft plan approval
6. Other lands designated – includes units in areas that are designated but do not have draft plan approval
7. Other lands not designated – includes units in areas that require Official Plan Amendments and have no approval

Allocated = Categories 1 to 4

Reserved = Category 5

No Capacity = Categories 6 and 7

To determine units available for allocation, built capacity (i.e. servicing capacity of the existing built Town water and wastewater infrastructure) will be used. To determine units available for reservation, planned and approved capacity (e.g. facility design complete, Environmental Compliance Approval obtained) will be used. If no planned or approved capacity is available, the total capacity for reservation and allocation is the built capacity.

Water

From 2021 to 2022 the number of connected water units in the Town increased by 263 units for a total of 9,982 connected units. See Figure 1 below.

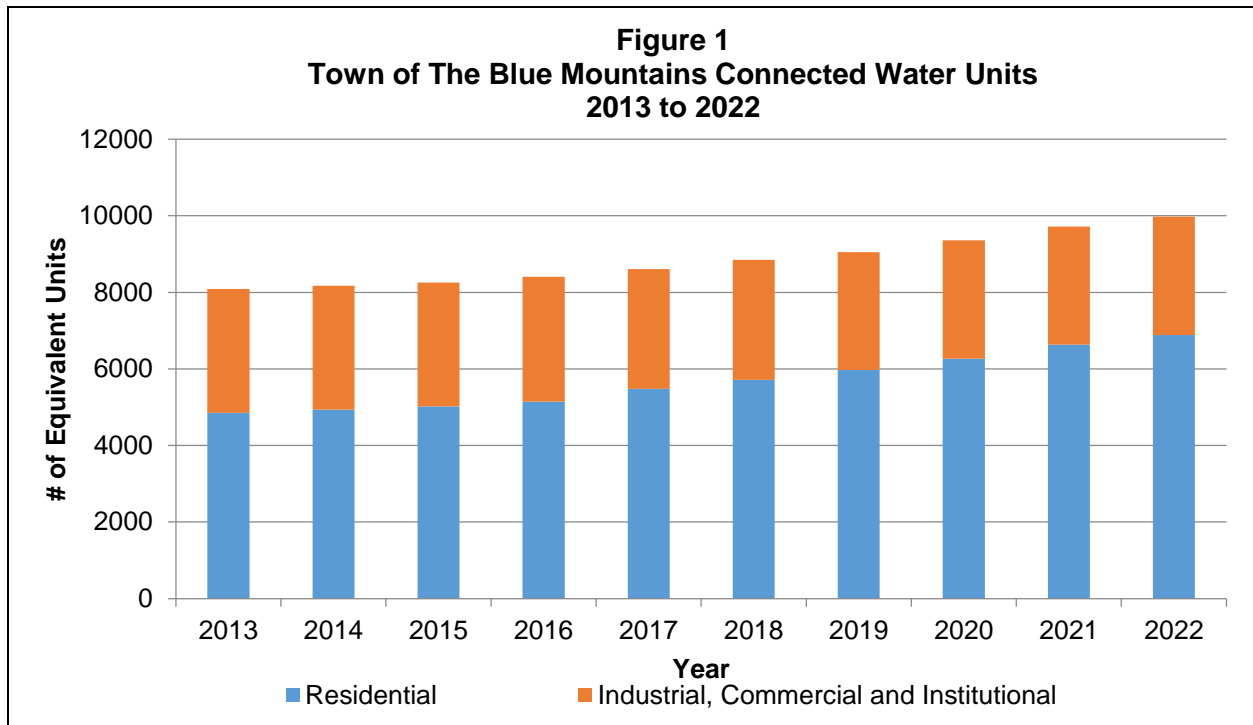
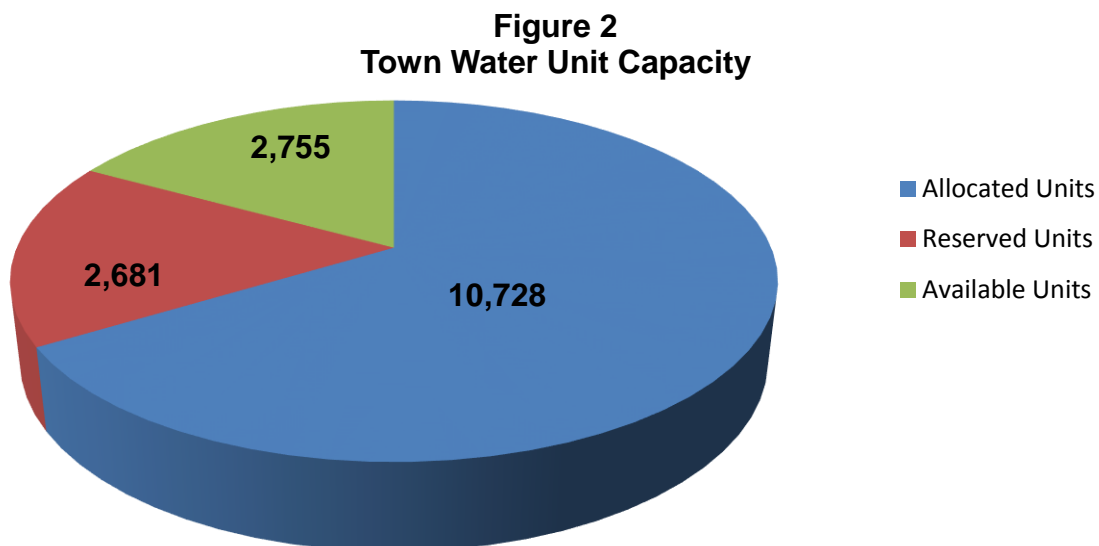


Figure 2 below illustrated the unit capacity of the Town's water system. Of the total system capacity of 16,164 units, 10,728 units are allocated, and 2,681 units are reserved. This leaves 2,755 available units.



The Town of The Blue Mountains' total firm water capacity available is 16,390m³/day or 16,164 units based on the five-year rolling Maximum Day Demand (MDD) of 1.014m³/unit/day. The 16,390m³/day includes 1,250m³/day received from the Town of Collingwood as identified in the Water Supply Agreement.

The evaluation for the water system does not include considerations for the Campus of Care and the additional units for sites B, E and F at the Village, as they were not far enough along in the planning process by the end of 2022.

The Town has a challenging water system in regard to leakage. Within the Town's water system, there are 14 different pressure zones. The system is long and narrow and runs along the shoreline. The shale provides an excellent opportunity for the water that has leaked out of the system to get the bay, without surfacing. Many of the lots serviced by the water system are estate type lots, meaning they are much larger than city lots, and few users between each pipe. Water tends to leak between joints and fittings. When there are few users between each pipe length or connection, the percent of water loss increased, because the amount of water being accounted for by users is less, however still experiencing the same volume of water loss. For the relative length of the system, 120kms, there are few users, in comparison to other municipalities.

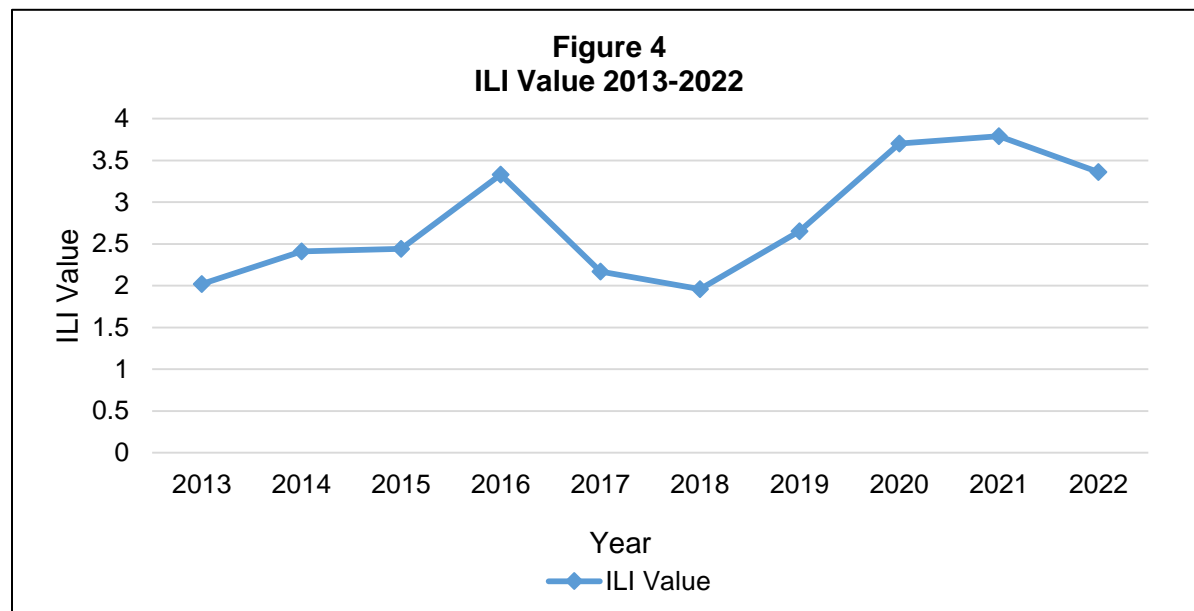
Infrastructure Leakage Index

The Infrastructure Leakage Index (ILI) is a performance index of a system's water loss. ILI was developed by the International Water Association. The ILI is the ratio of current annual real losses to unavoidable annual real losses. It is derived from the structural and operational characteristics of the distribution system and is considered by the industry as a better indicator of a system's condition. The ILI calculation considers the length of the service connections, the operating pressures, the length of the system and the number of users on the system.

There are four technical performance categories utilized for the ILI values by the International Water Association Water Loss Task Force.

ILI 1 to 2	EXCELLENT	Further loss reduction may be uneconomical unless there are shortages.
ILI 2 to 4	GOOD	Potential for marked improvements, consider pressure management, better active leakage control practices and improved network maintenance.
ILI 4 to 8	POOR	Poor leakage record, tolerable only if water is plentiful and cheap, analyze level and nature of leakage and intensify leakage reduction efforts.
ILI >8	VERY BAD	Very inefficient use of resources; leakage reduction programs imperative and high priority.

Figure 4 below illustrated the ILU for the Town from 2013 to 2022



The Town falls within the “Good” range for managing non-revenue water or real losses. However, this category also identifies room for improvement and continual monitoring to further reduce the losses. Staff continue to source leaks and repair as soon as possible.

Table 1 summarizes the water produced, consumed, and lost.

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022
Water Produced (TBM) (ML)	1176.8	1452.9	1618.2	1541.0	1585.3	1793.4	1899.8	2033.7	2004.1
Imported Water (ML)	312.8	222.9	190.0	171.0	212.7	185.0	198.4	198.7	199.6
Exported Water (ML)	2.6	54.8	24.0	25.9	31.5	32.9	35.5	42.9	40.3
Total Water Available (ML)	1487.0	1621.0	1784.2	1686.2	1766.5	1945.5	2062.7	2189.4	2163.5
Billed Authorized Consumption (ML)	967.9	1054.3	1124.3	1057.0	1164.6	1335.6	1281.7	1258.2	1292.0
Unbilled Authorized Consumption (ML)	172.2	208.3	202.1	288.5	202.6	194.9	218.7	331.4	323.7
Apparent Losses* (ML)	100.7	101.1	101.5	102.2	102.4	102.9	103.2	103.4	103.4
Real Losses** (ML)	246.3	257.3	356.3	238.4	296.9	312.1	562.4	599.8	547.8
Real Water Loss (%)	16.6%	15.9%	20.0%	14.1%	16.8%	16.0%	27.26%	27.39%	25.32%
Total Water Loss (%)	23.3%	22.1%	25.7%	20.2%	22.6%	21.3%	32.26%	32.11%	30.10%

*Apparent Losses includes unauthorized consumption, customer metering inaccuracies and systematic data handling errors.

** Real Losses include the total volume of water that cannot be accounted for.

The total percentage of water loss for 2022 was 30.10%. This is slightly lower than 2021. The Town is currently undertaking a leak detection program to identify and repair leaks to reduce the water loss.

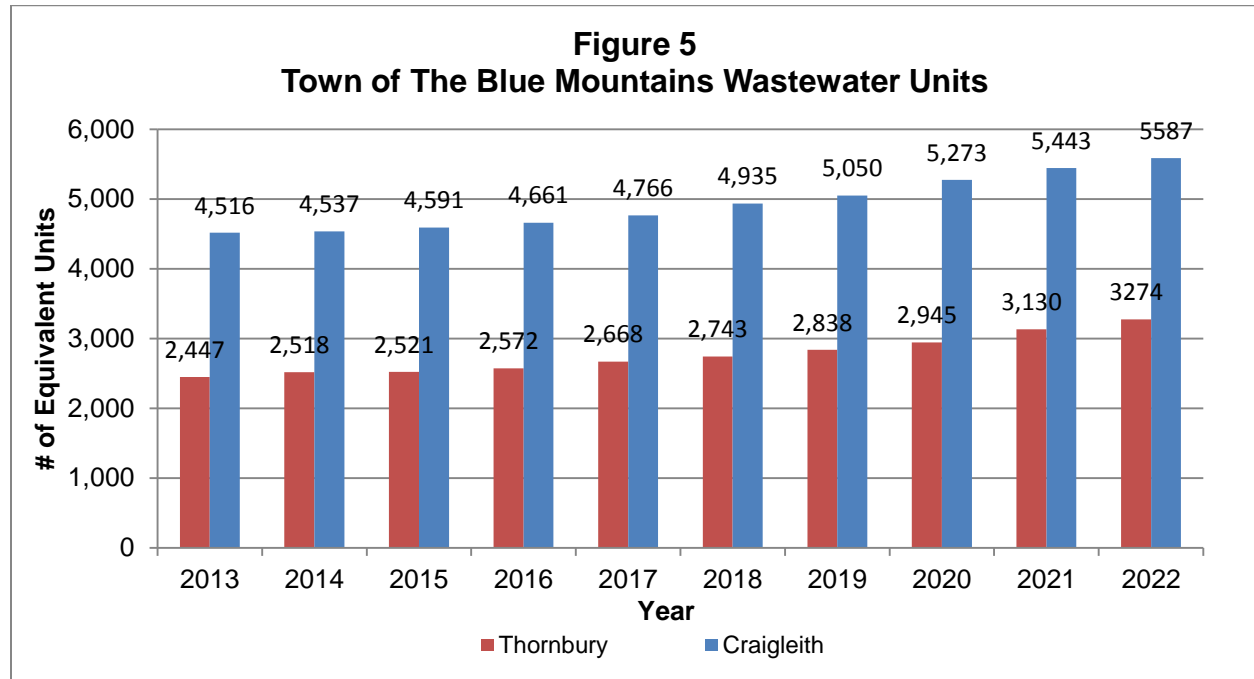
In 2022, Staff repaired three (3) watermain breaks, and twenty-one (21) service connection leaks. One of the watermain breaks was identified on the transmission main between Thornbury and the Arrowhead Road Booster Station. This was a significant break, that was challenging to repair, due to its location and depth of the watermain break. This break was identified on the July 1st long weekend. The water usage over this weekend was significantly higher than any other single day. It is estimated that the water loss from the break was approximately 1000m³/day.

Staff continue to search for leaks, and evidence of water theft. Water theft has been found in new developments, with construction companies illegally operating curb stops, utilizing unmetered connections for water during construction, leaving curb stops running during winter months to prevent the supply from freezing and establishing stations to facilitate water theft.

Year	Watermain Break Repairs	Service Leak Repairs
2015	5	14
2016	4	9
2017	3	3
2018	7	6
2019	7	6
2020	6	11
2021	3	31
2022	3	21

Wastewater

Figure 5 provides a historical breakdown of the number of wastewater units from 2013 to 2022.



From 2021 to 2022, the number of wastewater units in the Thornbury Service Area increased by 144 units for a total of 3,274 connected units. In the Craigleith Service Area, the number of wastewater units increased by 144 units for a total of 5,587 connected units.

Thornbury Wastewater Treatment Plant

The Thornbury Wastewater Treatment Plant's (WWTP) firm-built capacity is 3,580 m³/day or 3,925 units based on the historical five year rolling Average Daily Flow (ADF) of 0.912m³/unit/day.

In 2017, the Town completed an Addendum to the 2006 Environmental Assessment (EA) for the Thornbury WWTP. This Addendum looked at what had changed between 2006, when the initial EA was completed, and 2017. Upon completion of the EA, the Town applied for and acquired an Environmental Compliance Approval (ECA) for the construction of the Phase 1A expansion of the treatment plant. The Phase 1A expansion will increase the firm-built capacity from 3,580 m³/day to 5,330 m³/day.

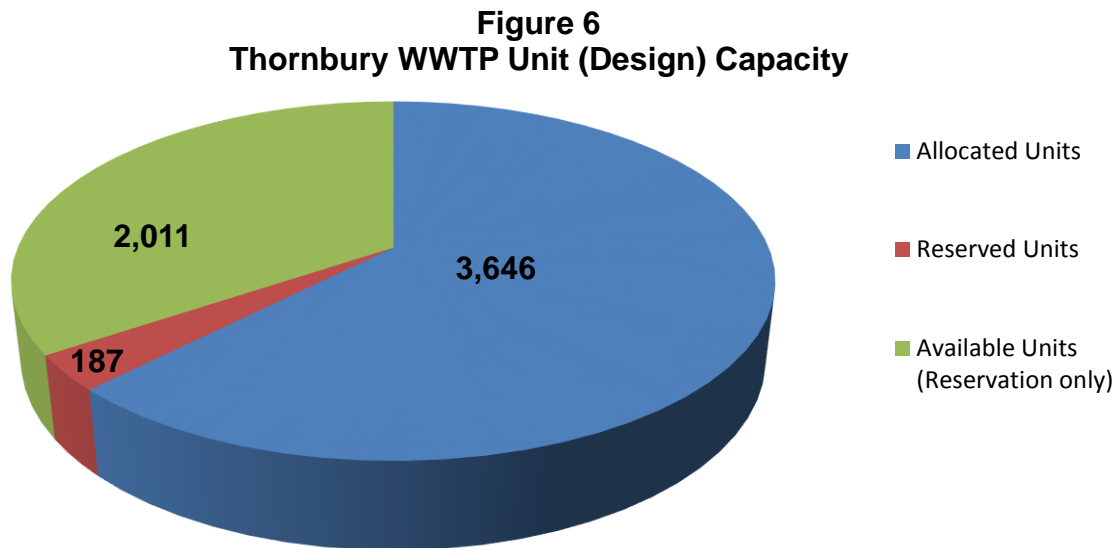
In 2022, the engineering for the Phase 1A expansion was completed. The construction, to commence in Q2 of 2023, was tendered. All permits required for the construction were obtained at the end of 2022.

Currently, there are 3,646 units (3,325 m³/day) allocated to the Thornbury WWTP and 187 units (171 m³/day) reserved. As the Town is able to reserve units based on the Phase 1A design

expansion of 5,330 m³/day, the Thornbury WWTP has a remaining total reservation of 2,011 units (1,834 m³/day).

The evaluation for the Thornbury Wastewater System does not include considerations for the Campus of Care, as this project was not far enough along in the planning process by the end of 2022.

Figure 6 below illustrated the 2022-unit (design) capacity for the Thornbury WWTP.



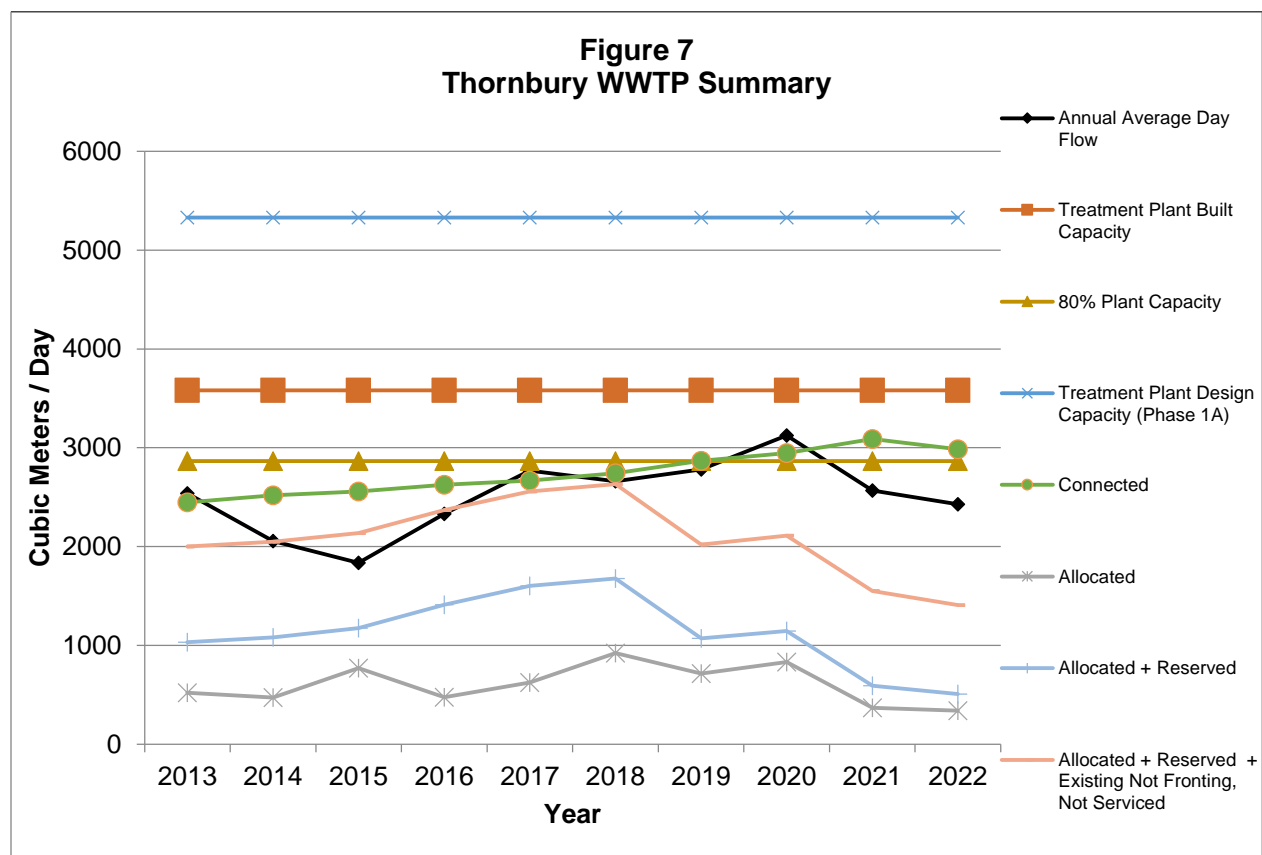
The Thornbury WWTP's five-year rolling Average Daily Flow (ADF) is 2,712m³/day, which means the current flows are utilizing 76% of the Thornbury WWTP built capacity. A five-year average flow is utilized to smooth out the noise of random outliers and emphasize long-term trends. The influent flows to the treatment plant have remained constant over the last few years.

Of the 3,925 units that could connect to the Thornbury WWTP, only 3,274 are currently connected.

The Thornbury WWTP receives a significant volume of extraneous flows. The extra flows are pushing the treatment plant facility to upgrades sooner than should be needed. Staff have been conducting an evaluation of the sanitary collection system throughout the entire municipality. This assessment includes closed caption videoing and assessment of the sanitary mains and maintenance hole inspections. This work identifies areas where the sewers are failing or requiring repair. In addition to the assessment, Staff have initiated an Inflow and Infiltration Strategy beginning with a communication plan to inform the public of the Town By-law and/or regulations regarding illegal connections to the system, such a roof leaders or sump pump connections. The first phase of the Strategy will primarily focus on the Thornbury WWTP collection area to reduce inflow issues. Ongoing capital projects such as the Thornbury West Reconstruction Project will result in significant improvement to inflow and infiltration once the aging sanitary lines are replaced and new stormwater laterals are connected to each residence.

The Town commenced Wastewater Collection System Master Plan Environmental Assessment (MPEA) in 2022. The MPEA is reviewing and building on past studies plus incorporating current growth projections to determine the wastewater collection network to build out of the Official Plan. This study builds upon the Needs Assessment completed in 2019. The MPEA is anticipated to be completed in 2024. The work includes 12 months of flow data, including a flow analysis of the flows from Short Term Accommodations (STAs) to ensure we are using the best available information when determining the impact from STAs.

Figure 7 below illustrates that the Thornbury WWTP has capacity based on the number of allocated and reserved units. The annual five-year rolling ADF remains below the 80% WWTP capacity threshold. Wastewater allocations and reservations in the Thornbury Collection System are monitored closely.



Craigleith Wastewater Treatment Plant

The Craigleith Wastewater Treatment Plant (WWTP) firm-built capacity is 8,133 m³/day or 12,609 units based on the five-year rolling ADF of 0.645 m³/unit/day.

Figure 8 below illustrated the 2022 built capacity for the Craigleith WWTP. Of the total built capacity (12,609 units), 5,878 are allocated and 2,707 units are reserved. This leaves 4,024 available units.

The evaluation for the Craigleith Wastewater System does not include considerations for the additional units at sites B, E and F, as they were not far enough along in the planning process by the end of 2022.

Figure 8
Craigleith WWTP Unit Capacity

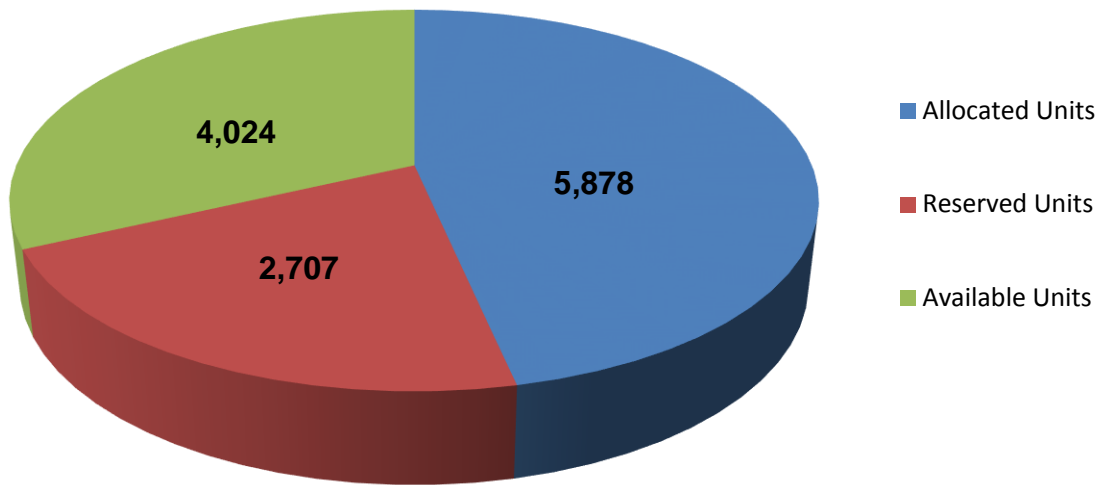
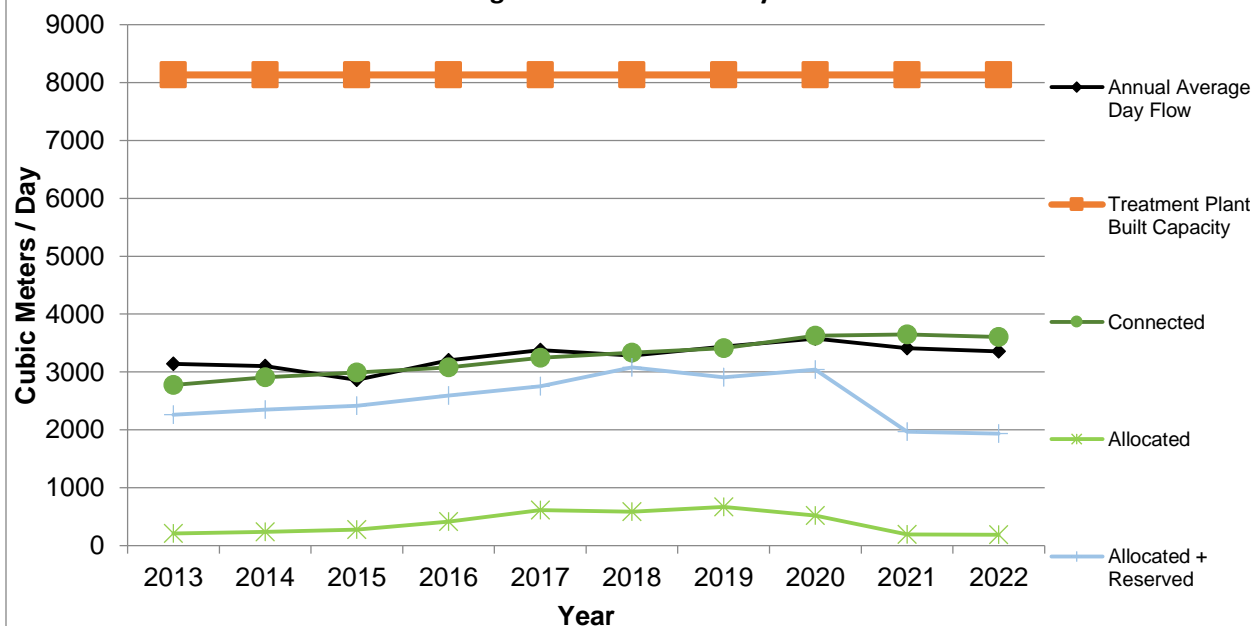


Figure 9 below illustrates that the Craigleith WWTP has available capacity and is able to treat the wastewater being received from the existing wastewater units in the Craigleith collection area as well as from the allocated and reserved future units. The Town currently has enough capacity to service an additional 4,024 units with wastewater in the Craigleith collection area.

Figure 9
Craigleith WWTP Summary



The 2022 Year End Water and Wastewater Capacity Assessment Report Executive Summary is included as Attachment #1 to provide an overview of the Report. The document in its entirety is available upon request.

E. Strategic Priorities

1. Communication and Engagement

We will enhance communications and engagement between Town Staff, Town residents and stakeholders

2. Organizational Excellence

We will continually seek out ways to improve the internal organization of Town Staff and the management of Town assets.

3. Community

We will protect and enhance the community feel and the character of the Town, while ensuring the responsible use of resources and restoration of nature.

4. Quality of Life

We will foster a high quality of life for full-time and part-time residents of all ages and stages, while welcoming visitors.

F. Environmental Impacts

The 2022 Year End Water and Wastewater Assessment provides the baseline data required for reporting and forecasting. It is integral to the development of water and wastewater services within the Town. The 2022 Year End Water and Wastewater Capacity Assessment is instrumental in environmental compliance reporting and for monitoring the Municipality's impact on the ecology of Georgian Bay.

G. Financial Impacts

The 2022 Year End Water and Wastewater Capacity Assessment does not have a direct financial impact however it forecasts the need for future capital expansions in both water and wastewater.

H. In Consultation With

Ruth Prince, Director of Finance & IT Services/Treasurer

Shawn Postma, Manager of Community Planning

Aaron Roninen, GIS/Planning Technician

Meg Boyd, Compliance & Efficiency Coordinator

I. Public Engagement

The topic of this Staff Report has not been the subject of a Public Meeting and/or a Public Information Centre as neither a Public Meeting nor a Public Information Centre are required. However, any comments regarding this report should be submitted to Allison Kershaw, Manager of Water & Wastewater Services managerwww@thebluemountains.ca.

J. Attached

1. Executive Summary – 2022 Water and Wastewater Capacity Assessment
2. Development Staging Process

Respectfully submitted,

Allison Kershaw,
Manager of Water & Wastewater Services

Shawn Carey
Director Operations

For more information, please contact:
Allison Kershaw, Manager of Water & Wastewater Services
managerwww@thebluemountains.ca
519-599-3131 extension 226

Report Approval Details

Document Title:	CSOPS.23.041 2022 Year End Water and Wastewater Capacity Assessment .docx
Attachments:	- Attachment-1-Executive-Summary.pdf - Attachment-2-Development-Staging-Process.pdf
Final Approval Date:	Jun 5, 2023

This report and all of its attachments were approved and signed as outlined below:

Allison Kershaw - Jun 2, 2023 - 4:13 PM

Shawn Carey - Jun 5, 2023 - 11:45 AM