



Staff Report

Operations – Water & Wastewater Services

Report To: COW-Operations_Planning_and_Development_Services
Meeting Date: July 2, 2024
Report Number: CSOPS.24.039
Title: 2023 Year End Water and Wastewater Capacity Report
Prepared by: Allison Kershaw, Manager of Water & Wastewater Services

A. Recommendations

THAT Council receive Staff Report CSOPS.24.039, entitled “2023 Year End Water and Wastewater Capacity Report” 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 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 2023 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 unserviced development. Attachment #2 provides an overview of the development staging process and requirements for moving through the process both new and existing unserviced

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.

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 land 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 = Categories 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 2022 to 2023 the number of connected water units in the Town increased by 183 units for a total of 10,165 connected units. See Figure 1 below.

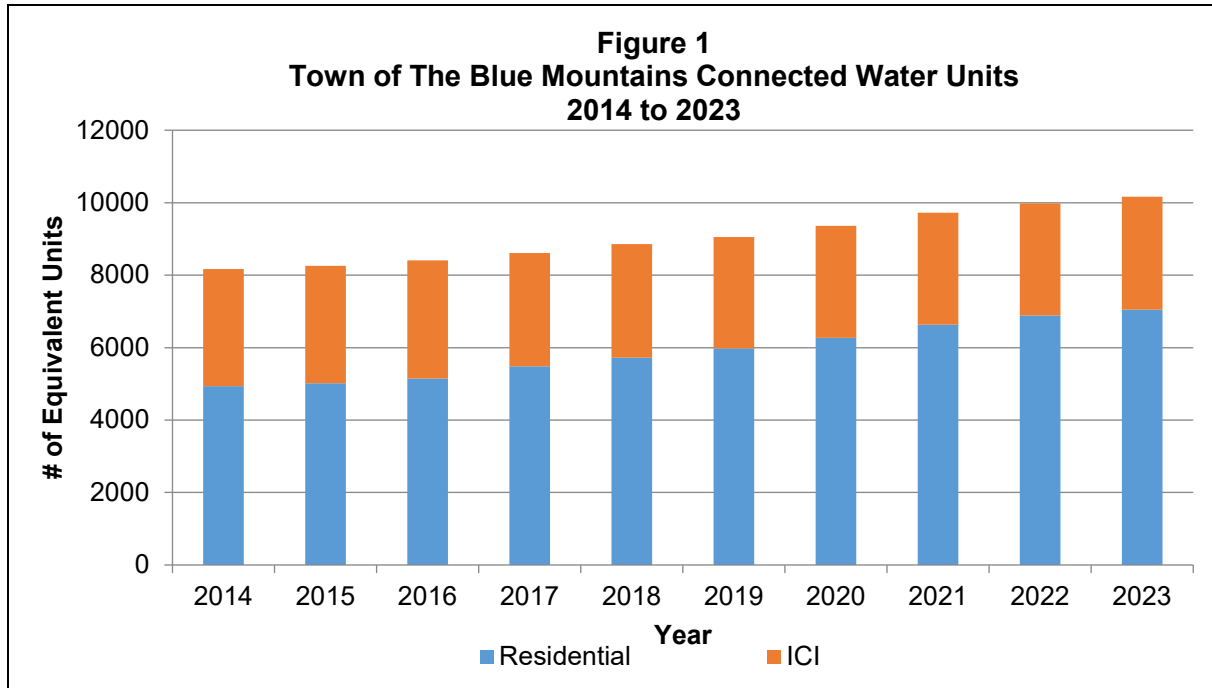
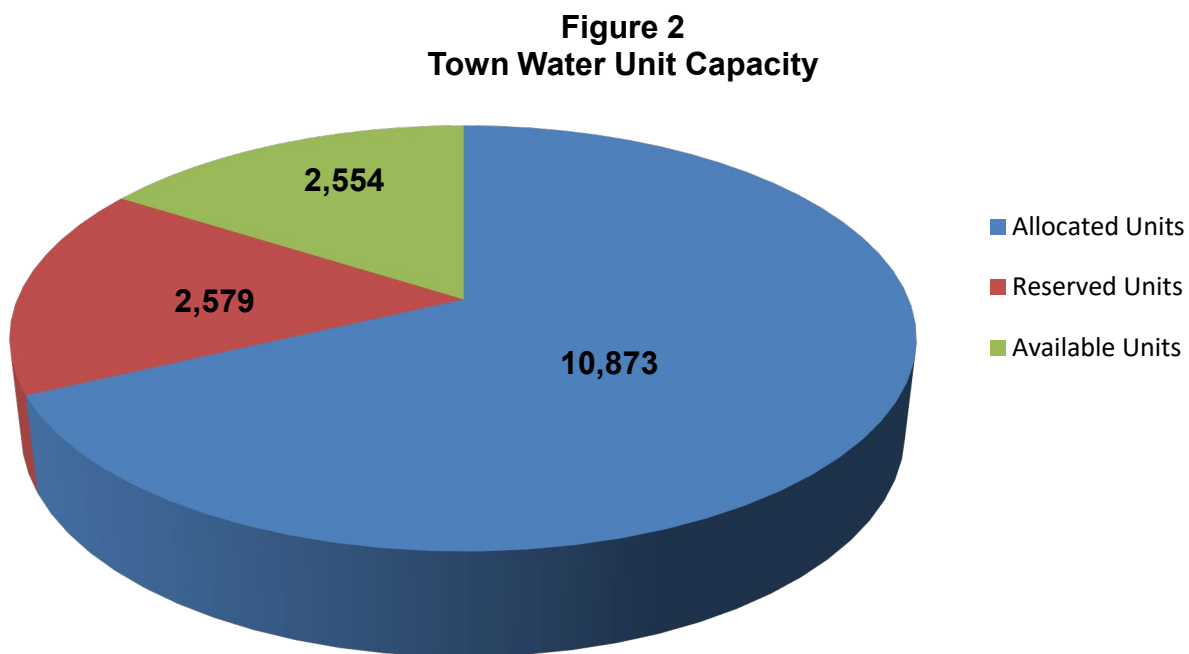


Figure 2 below illustrates the unit capacity of the Town’s water system. Of the total system capacity of 16,006 units, 10,873 units are allocated, and 2,579 units are reserved. This leaves 2,554 available units.



The Town of The Blue Mountains’ total firm water capacity available is 16,390m³/day or 16,006 units based on the five-year rolling Maximum Day Demand (MDD) of 1.024m³/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 include considerations for the Campus of Care and the additional units for sites B, E and F at the Village.

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, 150kms, there are few users, in comparison to other municipalities.

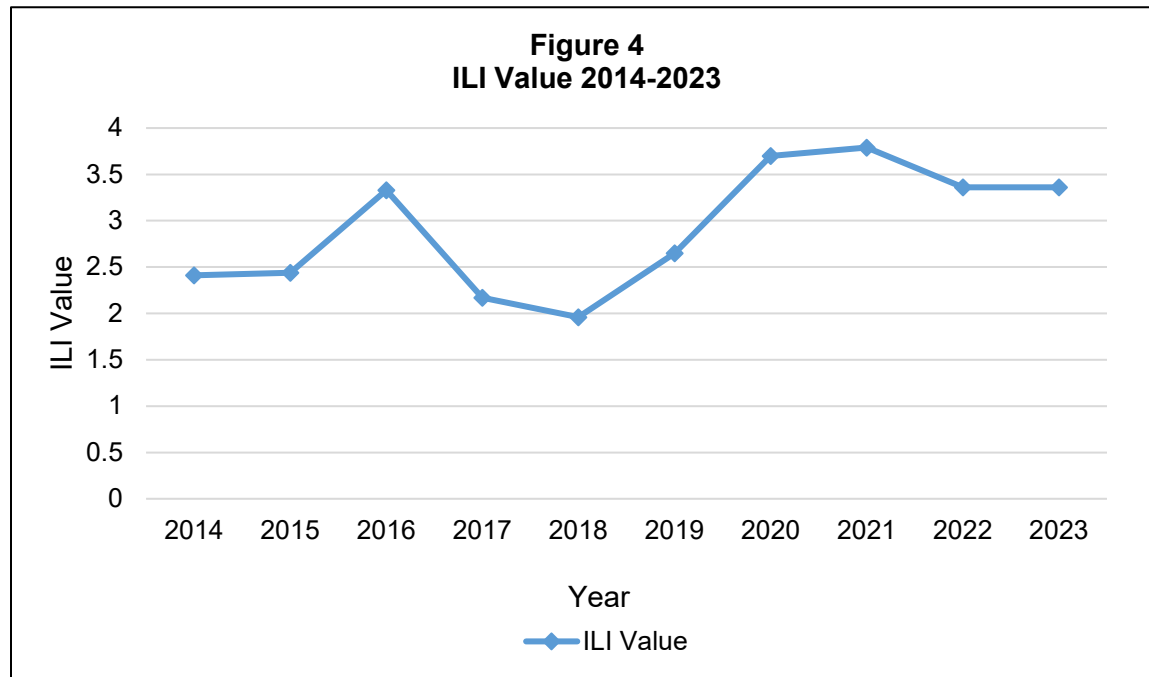
Infrastructure Leakage Index

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 illustrates the ILI for the Town from 2014 to 2023



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	2015	2016	2017	2018	2019	2020	2021	2022	2024
Water Produced (TBM) (ML)	1452.9	1618.2	1541.0	1585.3	1793.4	1899.8	2033.7	2004.1	2161.7
Imported Water (ML)	222.9	190.0	171.0	212.7	185.0	198.4	198.7	199.6	194.8
Exported Water (ML)	54.8	24.0	25.9	31.5	32.9	35.5	42.9	40.3	50.5
Total Water Available (ML)	1621.0	1784.2	1686.2	1766.5	1945.5	2062.7	2189.4	2163.5	2306
Billed Authorized Consumption (ML)	1054.3	1124.3	1057.0	1164.6	1335.6	1281.7	1258.2	1292.0	1289.2
Unbilled Authorized Consumption (ML)	208.3	202.1	288.5	202.6	194.9	218.7	331.4	323.7	459
Apparent Losses* (ML)	101.1	101.5	102.2	102.4	102.9	103.2	103.4	103.4	103.8
Real Losses** (ML)	257.3	356.3	238.4	296.9	312.1	562.4	599.8	547.8	557.8
Real Water Loss (%)	15.9%	20.0%	14.1%	16.8%	16.0%	27.26%	27.39%	25.32%	24.19%
Total Water Loss (%)	22.1%	25.7%	20.2%	22.6%	21.3%	32.26%	32.11%	30.10%	28.68%

*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 2023 was 28.68%. This is slightly lower than 2022. The Town continues with its current leak detection program to identify and repair leaks to reduce water loss.

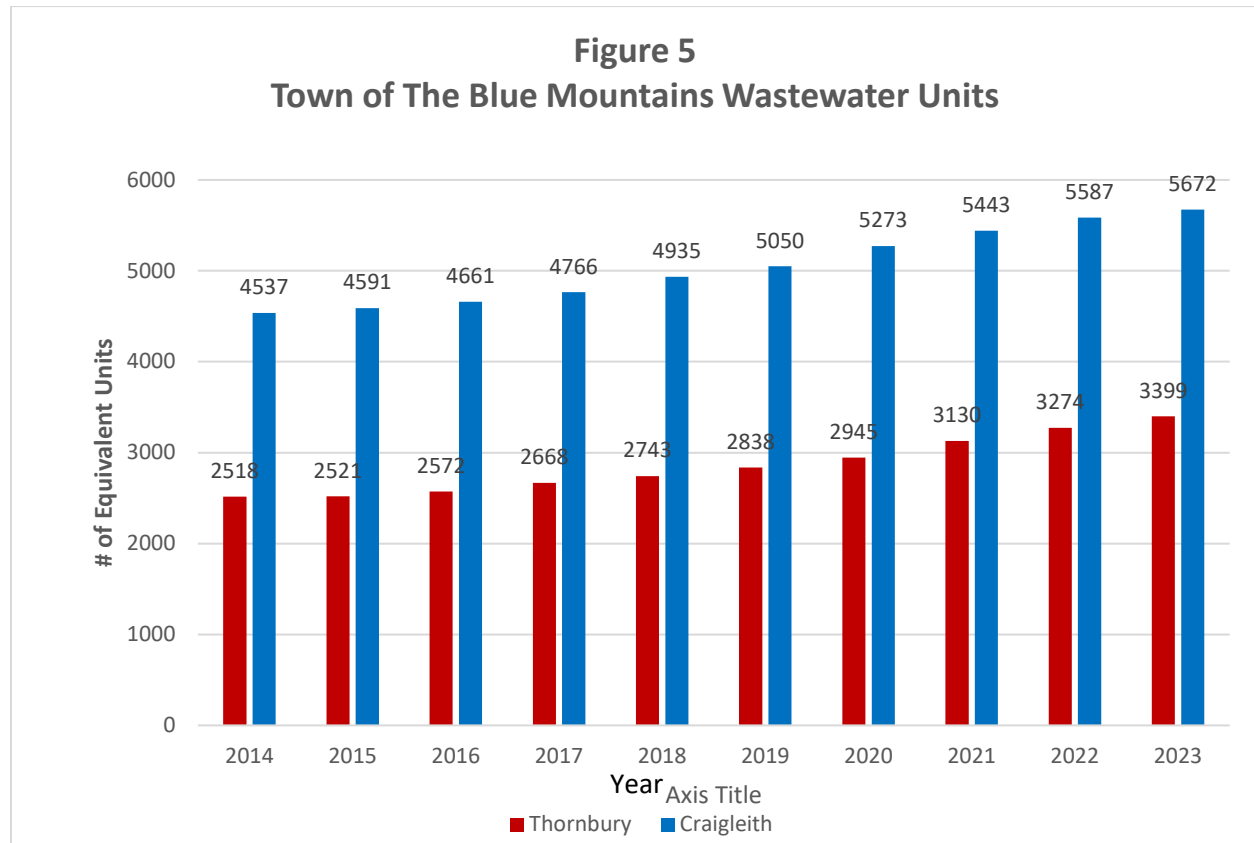
In 2023, Staff repaired 3 watermain breaks and 12 service connection leaks. Two of the three watermain breaks were on Bay Street, additionally, Staff repaired a service leak also on Bay Street.

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
2023	3	12

Wastewater

Figure 5 provides a historical breakdown of the number of wastewater connected units from 2014 to 2023



From 2022 to 2023, the number of wastewater units in the Thornbury Service Area increased by 125 units for a total of 3,399 connected units. In the Craigeith Service Area, the number of wastewater units increased by 85 units for a total of 5,672 connected units.

Thornbury Wastewater Treatment Plant

The Thornbury Wastewater Treatment Plant’s (WWTP) firm-built capacity is 3,580m³/day or 4,091 units based on the historical five-year rolling Average Daily Flow (ADF) or 0.875m³/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 will increase the firm-built capacity from 3,580m³/day to 5,330m³/day.

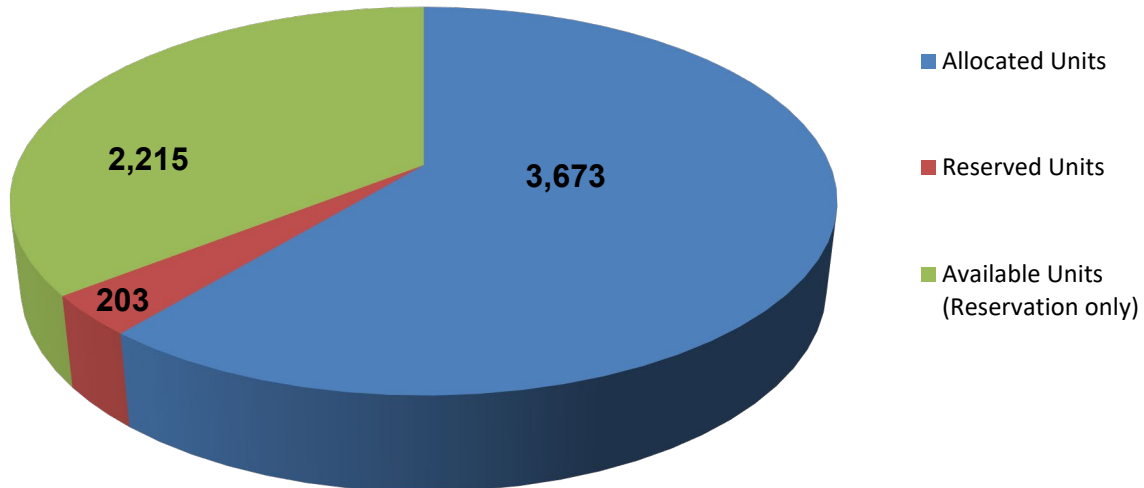
In 2022, the engineering for the Phase 1A expansion was completed. The construction for the expansion commenced in Q2 2023, with the anticipated completion of Q3 2025. Through the engineering of the expansion, it was noted that a new larger outfall was required to realize the additional capacity. The construction for a new outfall is to commence in Q2 2025.

Currently, there are 3,673 units (3,214m³/day) allocated to the Thornbury WWTP and 203 units (178m³/day) reserved. As the Town is able to reserve units based on the Phase 1A design

expansion of 5,330m³/day, the Thornbury WWTP has remained total reservation of 2,215 units (1938m³/day).

The evaluation of the Thornbury Wastewater System does not include considerations for the Campus of Care.

Figure 6
Thornbury WWTP Unit (Design) Capacity



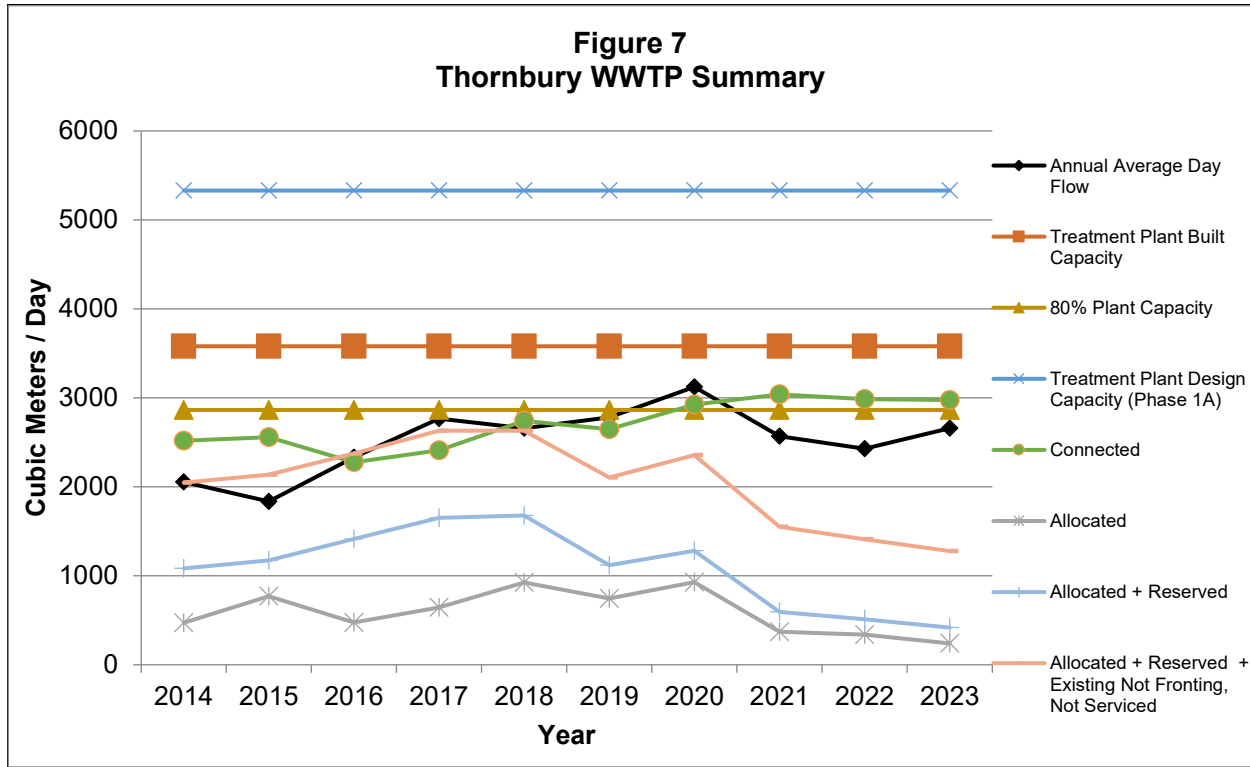
The Thornbury WWTP's five-year rolling Average Daily Flow (ADF) is 2,712m³/day, which means the current flows are utilizing 76% of the Thornbury WWTP built capacity. A five-year average flow is utilized to smooth out the noise of random outliers and emphasize long-term trends. The influent flows to the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

Of the 3,673 units that could connect to the Thornbury WWTP, only 3,399 units 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 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 2023, the Wastewater Master Plan Environmental Assessment (MPEA) commenced. 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 works also 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. The MPEA is anticipated to be completed late in 2024.

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 slightly 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 8,133m³/day or 12,708 units based on 0.640m³/unit/day.

Figure 8 below illustrates the 2023 built capacity for Craigleith WWTP. Of the total built capacity of (12,708 units), 6,015 units are allocated, and 2,571 units are reserved. This leaves 4,122 available units.

The evaluation for the Craigleith Wastewater System includes considerations for the additional units at sites B, E and F at the Village at Blue Mountain Resorts.

**Figure 8
 Craigleith WWTP Unit Capacity**

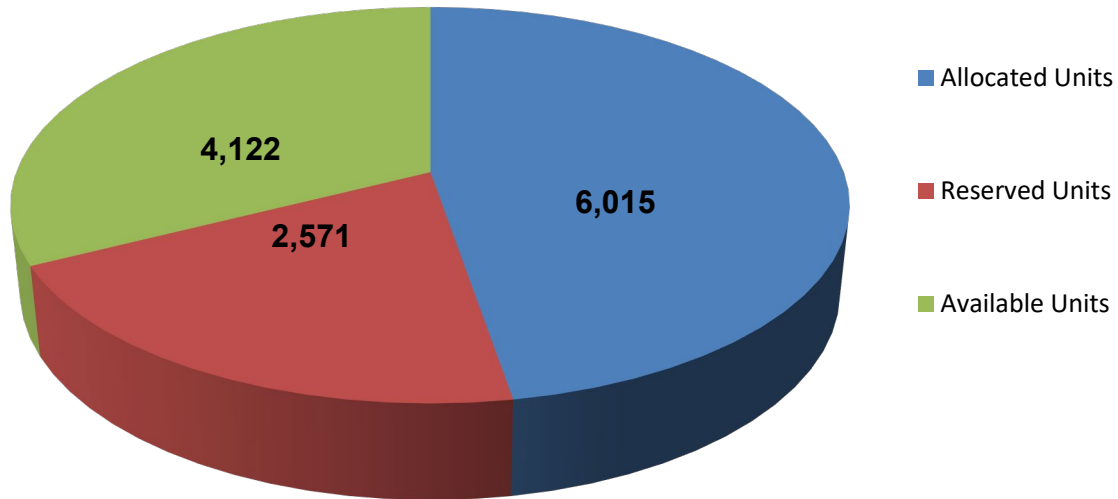
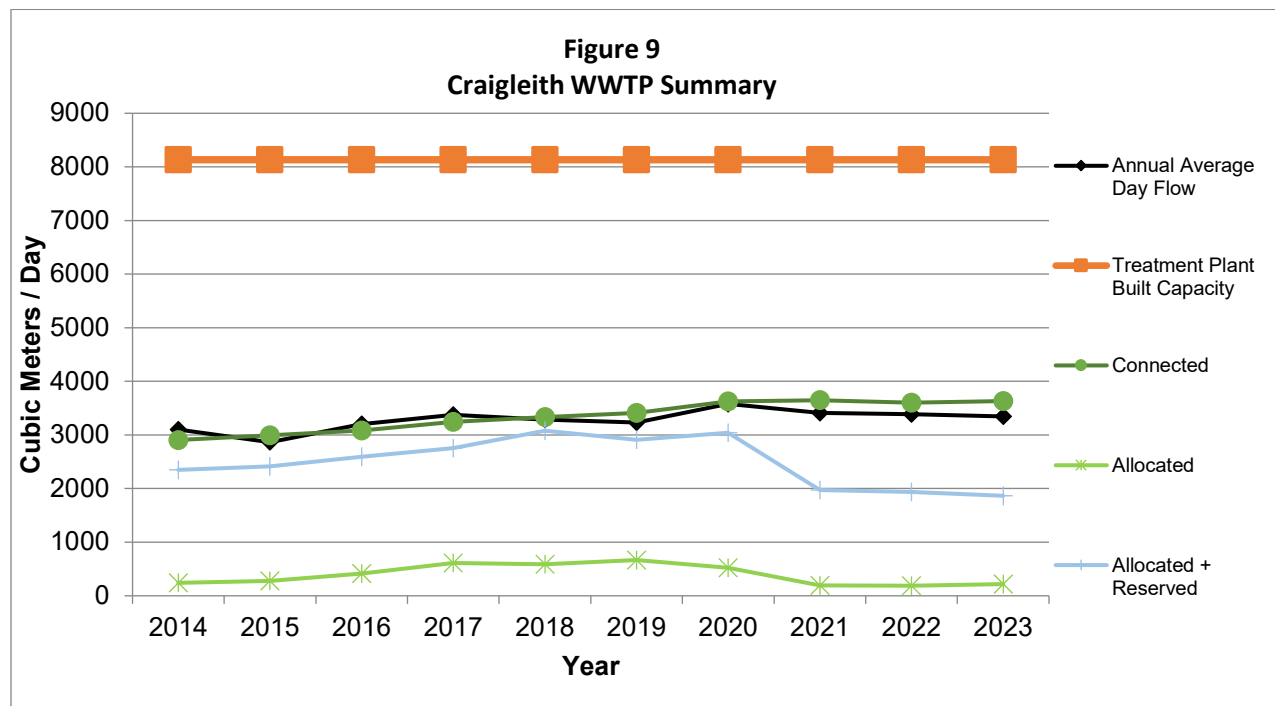


Figure 9 below illustrates that the Craigleith WWTP has available capacity and is able to treat the wastewater being received from the existing wastewater units in the Craigleith collection area as well as from the allocated and reserved future units. The Town currently has enough capacity to service an additionally 4,122 units with wastewater in the Craigleith collection area.



The 2023 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 2023 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 2023 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 2023 Year End Water and Wastewater Capacity Assessment does not have a direct financial impact however it forecasts the need for future capacity expansions in both water and wastewater.

H. In Consultation With

Adam Smith, Director of Planning and Development

Shawn Postma Manager of Planning,

Aaron Roininen GIS Planning Specialist,

Brian Worsley Manager of Development Engineering,

Meg Boyd Water & Wastewater Compliance & Efficiency Coordinator,

Sam Dinsmore Acting Director of Finance

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 – 2023 Water & Wastewater Capacity Assessment
2. Development Staging Process

Respectfully submitted,

Allison Kershaw,
Manager of Water & Wastewater Services

Jeffery Fletcher
Acting Director Operations

For more information, please contact:
Allison Kershaw, Manager of Water & Wastewater Services
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Report Approval Details

Document Title:	CSOPS.24.039 2023 Year End Water and Wastewater Capacity Report.docx
Attachments:	- Attachment 1 Executive Summary.pdf - Attachment 2 Development Staging Process.pdf
Final Approval Date:	Jun 4, 2024

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

Allison Kershaw - May 27, 2024 - 12:12 PM

Alan Pacheco - Jun 4, 2024 - 9:52 AM

Executive Summary

This report provides an assessment of water and wastewater treatment systems capacity within the Town for 2023. Current Town water supply and wastewater treatment infrastructure includes:

- The Blue Mountains Water Treatment Plant & Distribution System
- Supplemental water supply from the Town of Collingwood
- Thornbury Wastewater Treatment Plant & Collection System
- Craigeleith Wastewater Treatment Plant & Collection System

According to Ministry of the Environment Conservation and Parks (MECP) Guideline D-5-1 entitled “Calculating and Reporting Uncommitted Reserve Capacity at Sewage and WTPs”, “The number of lots in approved plans of subdivisions, developments committed by virtue of approved zoning, new official plans or site-specific official plan amendments, should not exceed the design capacity of the sewage and/or water system. To ensure that capacity is not exceeded it is necessary to determine what uncommitted reserve capacity is available. This procedure provides a means for determining uncommitted reserve capacity.”¹ *** See note in TWWTP for modified calculation method.

Key Definitions: Allocations versus Reservations

Built capacity	Servicing capacity of existing built Town WTP and WWTP facilities and associated infrastructure (e.g. distribution and collections systems).
Design capacity	Servicing capacity of planned Town water supply and wastewater treatment facilities and associated infrastructure based on designed and approved capacity, typically available when an ECA is obtained.
Allocation*	Commitment of built plant capacity; and “allocation of servicing capacity” or “allocated servicing capacity” shall have a corresponding meaning.
Reservation*	Commitment of approved design capacity, available when design is completed, and approvals are obtained and “reservation of servicing capacity” or “reserved servicing capacity” shall have a corresponding meaning.

* To determine units available for allocation, built capacity will be used. To determine units available for reservation, planned and approved capacity (e.g. facility design complete, ECA obtained) will be used. If no planned or approved capacity is available, the total capacity for reservation and allocation is the built capacity.

¹ MECP guideline D-5-1 entitled, “Calculating and Reporting Uncommitted Reserve Capacity at Sewage and WTPs”, updated March 1995.

Water Supply

1. Total Blue Mountains WTP Capacity

The firm capacity available from the Blue Mountains WTP is 15,140 m³/day. The Town receives up to 1,250 m³/day supplemental supply from the Town of Collingwood.

Therefore, the total firm water capacity available is 16,390 m³/day or 16,006 units based on the 5-year rolling MDD of 1.024 m³/unit/day.

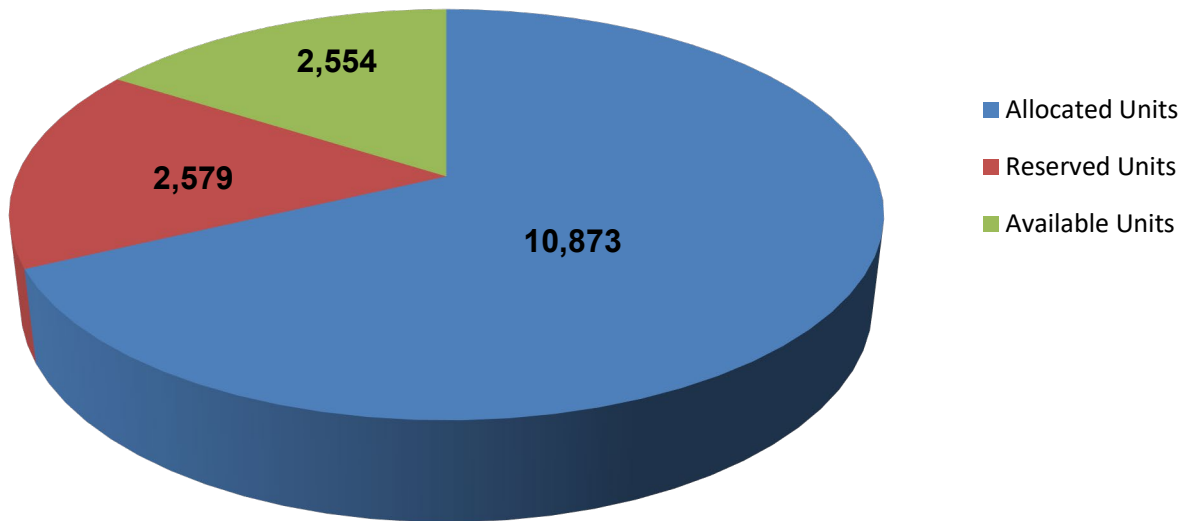
2. Available Water Capacity

A total demand of 11,134 m³/day (10,873 units) is currently connected or allocated to the water system based on a 5-year rolling average maximum daily demand of 1.024 m³/unit/day.

A total flow of 2,641 m³/day (2,579 units) is currently reserved at 1.024 m³/unit/day.

Of the 16,006 total units of water supply available, there are currently 13,452 units allocated and reserved. Therefore, the current available capacity of the Town's water supply is 2,554 units.

Town Water Unit Capacity



Thornbury Wastewater Treatment Plant

1. Total Thornbury WWTP Capacity

The total firm ADF built capacity available at the Thornbury WWTP is 3,580 m³/day or 4,091 units based on the 5-year rolling ADF of 0.875 m³/unit/day.

2. Available Wastewater Capacity Based on Planning Projections

A total flow of 3,214 m³/day (3,673 units) is currently connected or allocated to the Thornbury WWTP based on a 5-year rolling ADF. There are currently 3,673 units allocated and 203 reserved. Therefore, using planning projections the current available uncommitted reserve capacity based on built capacity is 215 units. However, as shown below not all units are physically connected.

The Thornbury WWTP is quickly approaching capacity based on allocated and reserved units. However, there are 477 units (203 reserved + 274 can connect) which are not physically connected to the Thornbury WWTP.

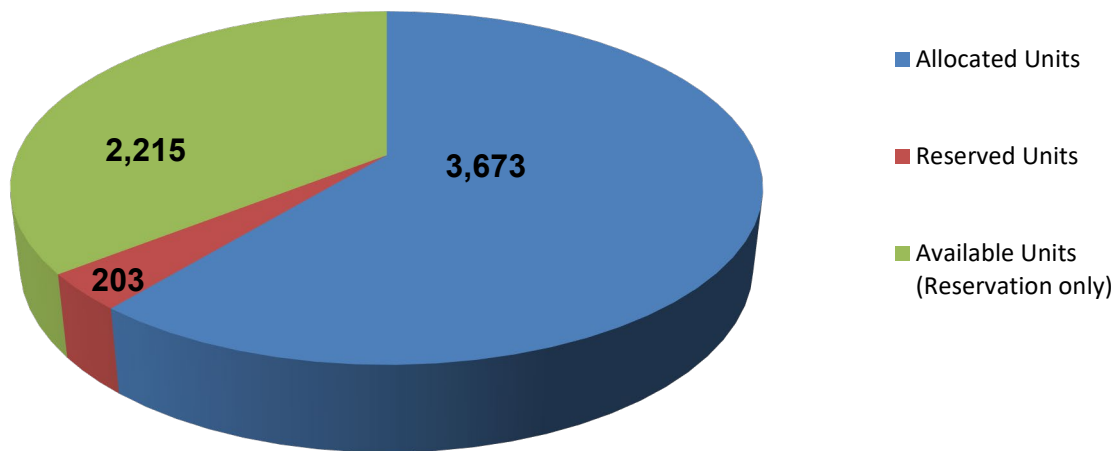
The MECP guideline for Year End reporting has been modified through discussion between the Town, Grey County and the MECP. The purpose of the modified method is to optimize the use of the Thornbury WWTP built capacity prior to commencing construction of additional capacity. Upon completion of construction of all proposed Phase 1A works, for which the Town has approval to construct, the ADF Design Capacity available will be 5,330 m³/d or 6,091 units based on an ECA received in 2019. Therefore, the current available uncommitted reserve capacity based on design capacity is 2,215 units.

The PDF flow at the Thornbury WWTP in 2023 was 9,218 m³/day. The design PDF for the Thornbury WWTP is 7,196 m³/d. The PDF typically occurs during a period of snow melt or a significant wet weather event. The peak day occurred on April 5, 2023, during a heavy rain event. The peak flow event did exceed the peak capacity of the treatment plant.

3. Thornbury WWTP Estimated Expansion Timeline

The Town has commenced with the expansion of the Thornbury WWTP. It is anticipated that the work will be completed in the second quarter of 2025. The Thornbury WWTP is operating at 76% of the built capacity based on a 5- year rolling average.

Thornbury WWTP Unit (Design) Capacity



Craigleith Wastewater Treatment Plant

1. Total Craigleith WWTP Capacity

The total firm ADF built capacity available at the Craigleith WWTP is 8,133 m³/day or 12,708 units based on the 5-year rolling ADF of 0.640 m³/unit/day.

2. Available Wastewater Capacity

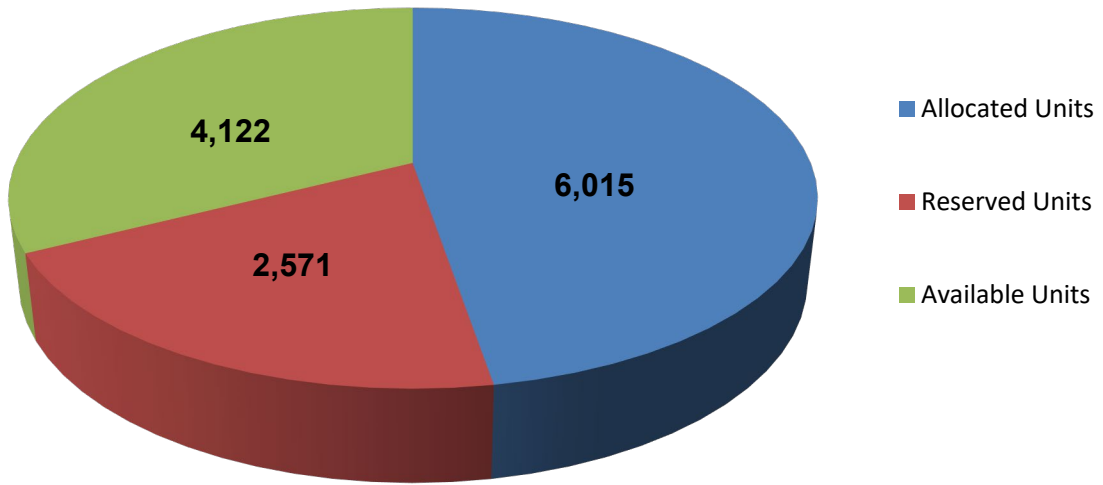
A total flow of 3,850 m³/day (6,015 units) is currently connected or allocated to the Craigleith WWTP, based on a 5-year rolling ADF. There are currently 6,014 units allocated and 2,571 units reserved. Therefore, the current uncommitted reserve capacity on built capacity is 4,122 units.

The PDF flow at the Craigleith WWTP in 2023 was 8,892 m³/day. This was on January 1, 2023. The design PDF for the Craigleith WWTP is 19,640 m³/d. The PDF typically occurs during a period of significant wet weather or a snow melt event.

3. Craigleith WWTP Estimated Expansion Timeline

Based on the 2023 five (5) year rolling ADF of 3,452 m³/day, the Craigleith WWTP is operating at 42% of the built capacity and as such, there is no immediate need to expand the Craigleith WWTP.

Craigleith WWTP Unit Capacity



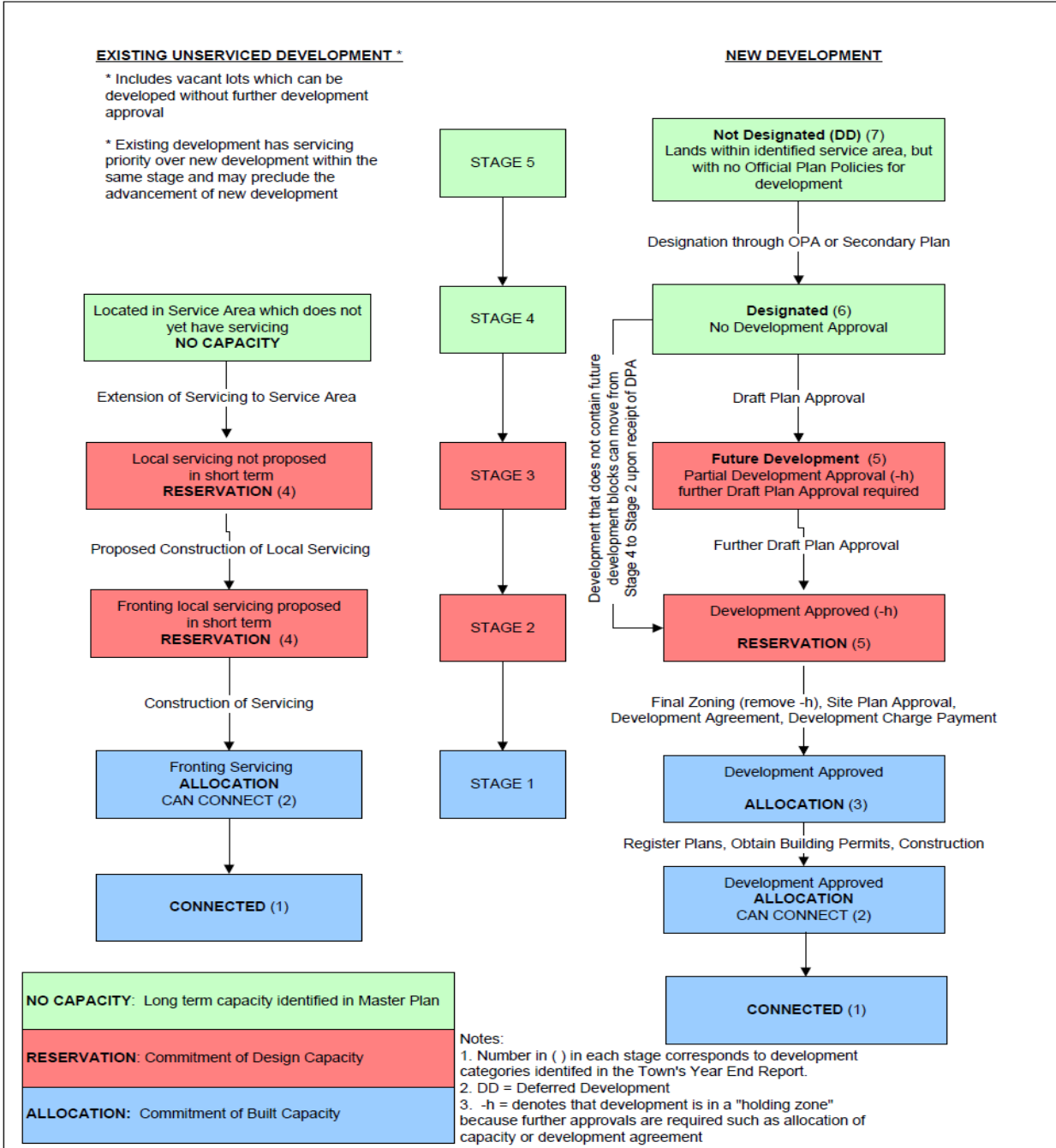


Figure 1: Development Staging Process

