

STAFF REPORT: Engineering & Public Works Department

REPORT TO: Infrastructure and Recreation Committee
MEETING DATE: November 10, 2009
REPORT NO.: EPW.09.069
SUBJECT: Water and Wastewater Capacity Assessment – 2008 Year End Report
PREPARED BY: John Caswell, Manager of Water & Wastewater Services/Asst. Director

A. Recommendations

THAT Council receive the Staff Report EPW.09.069 entitled Water and Wastewater Capacity Assessment – 2008 Year End Report for their information.

AND FURTHER THAT Council approve forwarding the 2008 Year End Report to the Grey County Planning Department as outlined in Report EPW.09.069 “Water and Wastewater Capacity Assessment- 2008 Year End Report.”

B. Background

The Town is required to annually complete a year end water and wastewater capacity assessment report and provide the report to the upper tier government being 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 and also provides current information on flows from existing development.

The Water and Wastewater Capacity Assessment – 2008 Year End Report was prepared by Town staff.

For 2008, a revised method of counting and tracking all water and sewer units has been developed by the Town. Geographic Information Systems technology (GIS) was used to record the total number of water units and sewer units for each and every property in The Blue Mountains. These total units were then divided among one or more “development categories” based on connection status (connected, can connect, committed, reserved, existing not fronting, designated with proposal, designated no proposal and future development). Using the GIS technology, data within each of these categories was accurately displayed, maintained and analysed as either maps (display format) or spreadsheet (data format) interchangeably. Future changes made to the mapping will automatically update the database and vice versa.

The introduction of maps to the Year End Report provides a coloured visual description as to the status of all properties across the municipality. The use of the spreadsheets includes over 5000 records in each of the water and sewer databases which can be analyzed and summarized in a MS Excel Spreadsheet.

The GIS also enables more accurate error checking through the ability to apply mathematical formulas to the entire database in order to look for inconsistencies in the data such as double counting or missing units. Visual inspections of the maps can also error check the location of any data outliers or missing data.

Looking to the future of the Year End Reports, new connection data will be exported and imported into the GIS from the original connections database stored with the Finance & Information Services Department. Progress in Planning Applications will continue to be tracked and maintained through the Building & Planning Services based on year end status.

The Thornbury Water Treatment Plant continues to deliver a high quality of drinking water which adheres to all Provincial Regulations and stringent testing requirements. There were no significant water quality concerns arising from the 2008 reporting period.

Both the Thornbury Wastewater Treatment Plant and the Craigeith Wastewater Treatment Plant continue to experience a high degree of suspended solids, BOD₅ and phosphorous removal efficiency. As a result, both facilities operate well within their Certificate of Approval design objective.

A review of the 2008 capacity status has identified that the water supply system and the Thornbury Wastewater Treatment Plant over allocated as of December 2008 and require detailed designs and Certificates of Approval for expansion or upgrading prior to additional connections unless other arrangements can be made.

The following works are proposed:

Water Supply

- Increase in the water supply by increasing the supply from Thornbury or by advancing the Collingwood Supply. This was determined in the Combined EA Phase 2 Report completed in the summer of 2006. The Phase 4 ESR will be completed in 2009. The Town has recently completed the Thornbury WTP filtration upgrade that replaced the Neptune and Trident filters with membrane filter trains to return the Water Treatment Plant to its original Certificate of Approval capacity.
- The need for additional water storage was identified in the Master Servicing Plan. Hydraulic Water Modeling is required to confirm the need and size for additional storage. Once the model is finalized, design will be undertaken and Certificates of Approvals obtained.

Thornbury Wastewater Treatment Plant

- The Town has awarded the design for the expansion of the Thornbury Wastewater Treatment Plant to Stantec Consulting Inc. A submission has been made to the Ministry of Environment to receive a Certificate of Approval.

The Executive Summary is provided as Attachment #1.

The Water and Wastewater Capacity Assessment -2008 Year End Report is available for review.

C. The Blue Mountains' Strategic Plan

The Water and Wastewater Capacity Assessment – 2008 Year End Report furthers the Town's Strategic Goal #2, "Addressing the Town's municipal infrastructure needs".

D. Environmental Impacts

The Water and Wastewater Capacity Assessment – 2008 Year End Report provides the baseline data required for reporting and forecasting and is integral to development of the water and wastewater services for the Town. It is instrumental in environmental compliance reporting and in reducing the municipality's impact on the ecology of Georgian Bay.

E. Budget Impact

None directly, however, the Water and Wastewater Capacity Assessment – 2008 Year End Report forecasts the need for capital expansions in both water and wastewater.

F. Attached

Attachment #1 – 2008 Year End Report Executive Summary

Labour

Respectfully submitted,

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Executive Summary

This report provides an assessment of water and wastewater treatment systems capacity within the Town of The Blue Mountains (Town) for 2008. Current Town water and wastewater supply and treatment infrastructure includes:

- Thornbury Wastewater Treatment Plant
- Craigleith Wastewater Treatment Plant
- Thornbury Water Treatment Plant
- Supplemental water supply from the Town of Collingwood

In addition, this report provides a review of the capacity of water storage reservoirs, water booster stations, WWPS and forcemains, and identifies current or proposed system upgrades or expansion projects.

The following pages summarize the status of the Town's Water Supply, Thornbury Wastewater Treatment Plant and the Craigleith Wastewater Treatment Plant:

Water Supply (Thornbury Water Treatment Plant + Collingwood Supply)

1. Average Day and Maximum Day Water Demands

The average daily demand for water for 2008 is 4,616 m³/day. The 5 year rolling average is 0.656 m³/unit/day.

The maximum daily demand increased proportionately with previous years to 10,765 m³/day. The 5 year rolling average increased slightly from 2007 to 1.350 m³/unit/day.

2. Total Water Supply

The maximum installed capacity available from the Thornbury WTP is 9,953 m³/day. The supplemental supply from the Town of Collingwood is 2,500 m³/day effective January 5, 2007. Therefore, the total supply available is 12,453 m³/day.

Using the 1.350 m³/unit/day (as identified above) a total of 9,224 units can be supplied with water.

3. Total Water Connections

A total of 7,359 units are connected to the water system. This represents a total flow of 9,935 m³/day.

Based on these connections 79.8% of the water supply is being used leaving 20.2% of the water supply available for future connections.

4. Total Water Allocations

A total of 8,325 units are connected or allocated to the water system. This represents a total flow of 11,239 m³/day.

Based on this allocation 90.3% of the water supply has been allocated to those units that can connect (units that front the service but are not connected) or have been committed (approved and existing development). This leaves only 9.7% of the water supply available for future allocation.

5. Total Water Reservations

A total of 1,533 units are reserved in 2008. This represents a total flow of 2,070 m³/day.

This reservation represents 16.6% of the total water supply available. The units in this category include those units that are existing but not fronting and not serviced as well as those lands designated that currently have draft plan approval under the Planning Act.

Of the 1,533 units that are reserved, allocation is only available for 899 units. Therefore, no further capacity shall be "reserved" until additional water supply is available. Although the Town's water supply is showing a deficit in reserve capacity, additional supply for 2009 is anticipated. The Collingwood water supply shall increase to a minimum of 4,000 m³/day starting January 5th, 2009. In addition, filter upgrades to the Thornbury WTP are expected to increase Plant capacity from 9,953 m³/day to 13,536 m³/day.

Thornbury Wastewater Treatment Plant

1. Average Day Flow and Peak Day Flow

The 2008 average day flow has increased to 2,558 m³/day from 1,930 m³/day in 2007. The 5 year rolling average is 1.265 m³/unit/day.

The 2008 peak day flow increased to 8,653 m³/day from 8,216 m³/day in 2007. The 5 year rolling average has increased slightly from 2007 to 4.991 m³/unit/day.

2. Total Wastewater Plant Capacity

The Thornbury WWTP has an average day flow capacity of 3,580 m³/day and a peak day flow capacity of 7,196 m³/day.

Using the 1.265 m³/unit/day (as identified above) a total of 2,830 units can be serviced by the Thornbury WWTP.

3. Total Wastewater Connections

A total of 1,818 units are connected to the Thornbury WWTP. This represents a total flow of 2,300 m³/day.

Based on these connections 64.2% of the wastewater Plant's capacity is being used leaving 35.8% (1,012 units) of the Wastewater Plant's capacity available for future connections.

4. Total Wastewater Allocations

A total of 2,333 units are allocated to the Thornbury wastewater system (including connected units). This represents a total flow of 2,951 m³/day.

Based on this allocation 82.4% of the Thornbury WWTP capacity has been allocated to those units that can connect (lands that front the service but are not yet connected) or have been committed capacity (through an agreement). This leaves 497 units (17.6%) of the Thornbury WWTP capacity available for future allocation.

5. Total Wastewater Reservations

A total of 534 units are reserved for the Thornbury WWTP. This represents a total flow of 676 m³/day. The units in this category only includes *designated active lands* which currently have draft plan approval under the Planning Act. Units identified as *existing not fronting, not serviced* are not counted as reserved.

The allocation of new units or reserved units must only proceed under strict control. The Town shall adopt a policy to determine how and when the allocation of the available 497 units will be distributed prior to Plant expansion.

The Town has met with Grey County and the MOE to discuss enabling the Town to utilize existing available capacity at the Thornbury WWTP through a modified method of calculating capacity status (see section 4.3.3). The Town has planned and is actively pursuing the future expansion of the Plant. In this regard, the Town completed a comprehensive Environmental Assessment/Phase 4 Environmental Study Report (EA) in March 2006. This EA forms the foundation of the recently submitted C of A application for the future Phase 1A expansion of the Plant. The Phase 1A expansion will increase the capacity of the Plant from the current 3,580 m³/day (2,830 units) to 5,330 m³/day (4,213 units). The Town has committed to finalize design and commence construction of the expansion of the Plant the year after the Plant reaches 80% of its current capacity (or 2,264 units). Until such time as the Plant reaches 80%

capacity (estimated 2013), the Town will utilize the Phase 1A Plant design capacity as the reserved capacity. Therefore, an additional 1,346 units are available now for reservation.

6. Future Projections

The Town has committed to provide annual updates on the future projections of the Thornbury WWTP.

Estimates contained in the 2008 year end report include:

1. Connected units are estimated at 93 new connections per year (based on a 5 year average)
2. Allocated units are estimated to increase based on projected local servicing projects plus an estimated 45 units that will be registered and/or given Plant capacity per year

It is noted that market conditions and other economic factors will influence the actual connections and actual allocations per year. In this regard, all future year end reports will review all year end data and update all estimated future projections. Based on 2008 estimates, the Plant will reach 80% capacity in 2013. As indicated, the Town has committed to commencing construction of the expansion of the Plant the year after the Plant reaches 80% of its built capacity (or 2,264 units). (See Graph 4.6)

Craigleith Wastewater Treatment Plant

3. Average Day Flow and Peak Day Flow

The 2008 average day flow has increased to 3,137 m³/day from 2,407 m³/day in 2007. The 5 year rolling average has decreased slightly over the previous years to 0.718 m³/unit/day.

The 2008 peak day flow increased to 12,609 m³/day from 10,667 m³/day in 2007. The 5 year rolling average is 2.498 m³/unit/day.

4. Total Wastewater Plant Capacity

The Craigleith WWTP has an average day flow capacity of 8,133 m³/day and a peak day flow capacity of 19,640 m³/day.

Using the 0.718 m³/unit/day (as identified above) a total of 11,327 units can be serviced by the Craigleith WWTP.

5. Total Wastewater Connections

A total of 4,094 units are connected to the Craigleith WWTP. This represents a total flow of 2,940 m³/day.

Based on these connections 36.1% of the wastewater Plant's capacity is being used leaving 63.9% of the wastewater Plant's capacity available for future connections.

6. Total Wastewater Allocations

A total of 4,485 units are allocated to the Craigleith wastewater system (including connected units). This represents a total flow of 3,221 m³/day.

Based on this allocation 39.6% of the Craigleith WWTP capacity has been allocated to those units that can connect (units that front the service but are not connected) or have been committed (approved and existing development). This leaves 60.4% of the Craigleith WWTP capacity available for future allocation.

7. Total Wastewater Reservations

A total of 2,522 units are reserved for the Craigleith WWTP in 2008. This represents a total flow of 1,810 m³/day.

This reservation represents 22.3% of the total available capacity at the Craigleith WWTP. The units in this category include those units that are existing but not fronting and not serviced as well as those lands designated for approval and currently have draft plan approval under the Planning Act.

Of the 2,522 units that are reserved, allocation is available for 6,842 units. Therefore, 4,320 additional units can reserve capacity at the Craigleith WWTP for future development.

FUTURE SEVICING PROJECTS INCLUDED IN GRAPH:
(All project dates are estimates)

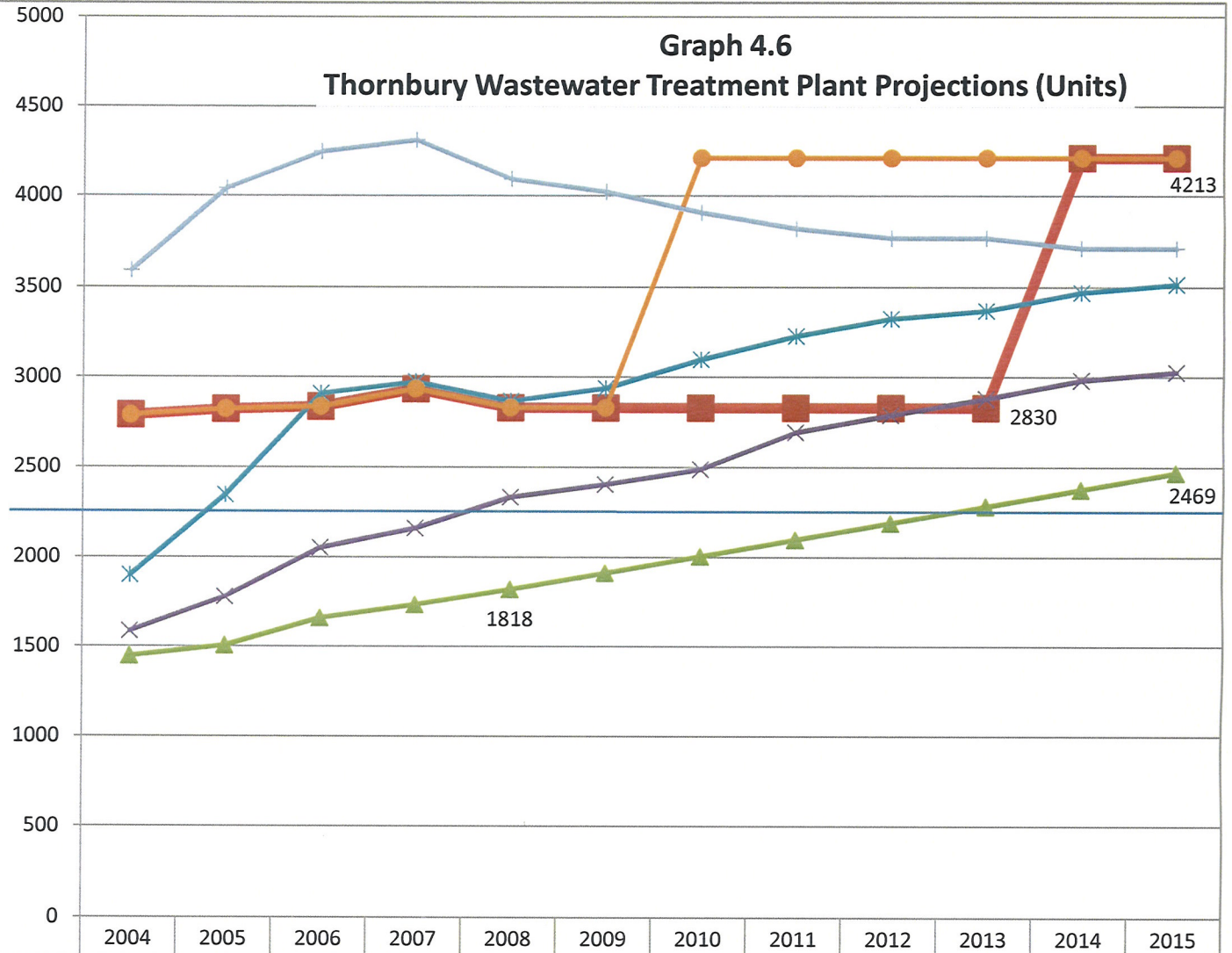
- 2009**
34 Units - Keepers Cove (Existing)
37 Units - Lake Drive
- 2010**
39 Units - Georgian View Estates
- 2011**
75 Units - Georgian Peaks Ski Club
86 Units - Peaks Surrounding Area
- 2012**
51 Units - Georgian Bay Golf Club
- 2013**
0 Units
- 2014**
56 Units - Teskey / Hoover / Camperdown Rd North
- 2015**
0 Units

* Connected Units = +93 Units Per Year (5 yr avg)

** Allocated Units = +Future Service Project + 45 Units
(est. Registrations / Plant Commitment)

2264 Units
(80% Plant Capacity)

Graph 4.6
Thornbury Wastewater Treatment Plant Projections (Units)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
◆ Annual Average Day Flow												
■ Treatment Plant (Built Capacity)	2790	2823	2837	2934	2830	2830	2830	2830	2830	2830	4213	4213
▲ Connected Units *	1445	1505	1658	1733	1818	1911	2004	2097	2190	2283	2376	2469
✕ Allocated Units **	1585	1778	2052	2161	2333	2404	2488	2694	2790	2880	2981	3026
* Allocated Units + Reserved Units	1898	2346	2908	2973	2867	2938	3097	3228	3324	3369	3470	3515
● Treatment Plant (Design Capacity)	2790	2823	2837	2934	2830	2830	4213	4213	4213	4213	4213	4213
+ Allocated + Reserved + Exist Not Fronting Not Serviced	3592	4040	4246	4310	4092	4021	3907	3821	3770	3770	3714	3714