Meeting Date:	Monday, March 22, 2021
To:	Mayor Mills and Members of Council
From:	**Jim Moss, Director of Development and Operations**
Report:	DO 2021-02
Subject:	**Sewage Capacity Allocation**

Recommendation

Be it Resolved that Council of the Town of Shelburne receives report DO2021-02 Sewage Capacity Allocation dated March 22, 2021 for information purposes.

Background

Council requested an update on the sewage capacity allocation of the current sewage treatment plant in late 2020 and directed staff to provide a report in early 2021.

Analysis

The Shelburne Sewage Treatment Plant has been upgraded and expanded several times since the original construction.

The Town also has undertaken universal water metering to promote water conservation as well as an infiltration program to stop storm and ground water entering the sanitary system and unnecessarily taxing the sewage treatment capacity of the plant.

These programs have been effective and resulted in annual sewage flows being maintained at 2012 levels and thereby supporting continued development.

The Town currently has several developments in varying stages of the development process.

This report and the accompanying analysis have confirmed there is not sufficient allocation for all development, and it will not be possible to service all requested development without upgrading the capacity of the Sewage Treatment Plant. The costs for the capital project are estimated to be significant. In a September 2020 report to Council the estimated range was $26 million to $33 million. Further reports will be provided in 2021 for Council's consideration regarding the project costs for the plant expansion.

The waste capacity and allocation analysis is outlined within reports and charts from SBA and GSP. These are provided in Appendices 1 to 4.

The Official Plan Development Staging Plan which is provided in Appendix 1 and related policies guide the allocation of servicing to new development.

- For Stage 1, reserve servicing capacity is required to allow for infilling and redevelopment in the built-up areas
- For Stage 2, reserve servicing capacity is required for vacant or under-utilized land in the built-up area and mixed use, commercial, employment and institutional areas
- For Stage 3, reserve servicing capacity is required for areas requiring extension of services, and parts of Stage 3 will require capacity upgrades
- In all areas, allocation of servicing to specific developments is determined at the time of development approval

The tables shown in Appendix 2 summarize the committed development approvals, planned development based on applications received and in process, and proposed developments. Appendix 3 shows the associated flows to the sewage treatment plant and remaining servicing capacity. Appendix 4 is the associated report from SBA that explains the analysis of data and background information used to arrive at the remaining Sewage Plant Capacity.

This information is briefly summarized below:

- 540 residential units in approved plans are currently allocated, some are under construction and it is expected that most of these units will be built and occupied within 2to 3 years
- 1.93 hectares (19,300 sq. m. or 208,000 square feet) of Gross Floor Area (GFA) of Industrial / Commercial / Institutional (ICI) development is currently approved and allocated, most of these buildings are under construction and all are expected to be built and occupied within 1-2 years

- Remaining capacity (unallocated) after factoring in the servicing commitments to the above development areas is estimated to provide for up to 94 residential units OR 2.83 hectares of ICI
- Current demands for residential development include 572 units, of which 311 units are planned in applications currently in process, 140 units on future development blocks in draft plans of subdivision, and the balance reflects planned or potential additional units in the downtown and 93 units proposed on land outside of the urban area boundary (Flato)
- Current ICI demands include the Fieldgate commercial site development (application in process) which is planned for construction this year, a request from Blue Mountain Plastics (BMP) for additional industrial effluent capacity for expanded operations, and pre-application consultations for additional industrial and institutional developments. In addition, there is future development potential on vacant/serviced industrial land in the Industrial Park, vacant/serviced commercial and institutional land, and expansion of existing industries, and a proposal for commercial development on land outside of the urban area boundary (Flato)
- The future residential and ICI demands significantly exceed the remaining unallocated capacity, and most of these demands will be dependent on increasing the Sewage Treatment Plant capacity which is subject to an Environmental Assessment (EA) nearing completion
- If the remaining (unallocated) capacity is allocated 80% to residential and 20% to ICI, this would allow for up to 75 additional residential units and 0.57 Ha of ICI to be allocated within the current rated capacity of the Sewage Treatment Plant
- In this scenario, the estimated demands exceed the remaining unallocated capacity by approximately 500 residential units and 9 hectares of ICI gross floor area.

Financial Impact

N/A

Policies & Implications

N/A

Consultation and Communications

Steve Burnett and Associates
GSP Group Inc

Council Strategic Priorities

Council's Strategic Priorities has three Goals - Sustainable, Engaged and Livable. There are a total of 12 targets with the three Goals.

The updated Sewage Capacity Allocation Report relates to the following Goals:

Target T2: Municipal services review and evaluation

Target T3: Invest in critical infrastructure

Target T6: Promote more open communication

Target T7: Promote partnership and collaboration

Target T8: Enhance marketing and education

Supporting Documentation

Appendix 1 – Development Staging Plan
Appendix 2 – GSP Allocation Table and Future Servicing Demands Tables
Appendix 3 – SBA Servicing Allocation Table
Appendix 4 – SBA Sewage Capacity Allocation Report

Prepared by:

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Jim Moss, Director of Development and Operations

Respectfully Submitted:

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Jim Moss, Director of Development and Operations

Reviewed by:

_____

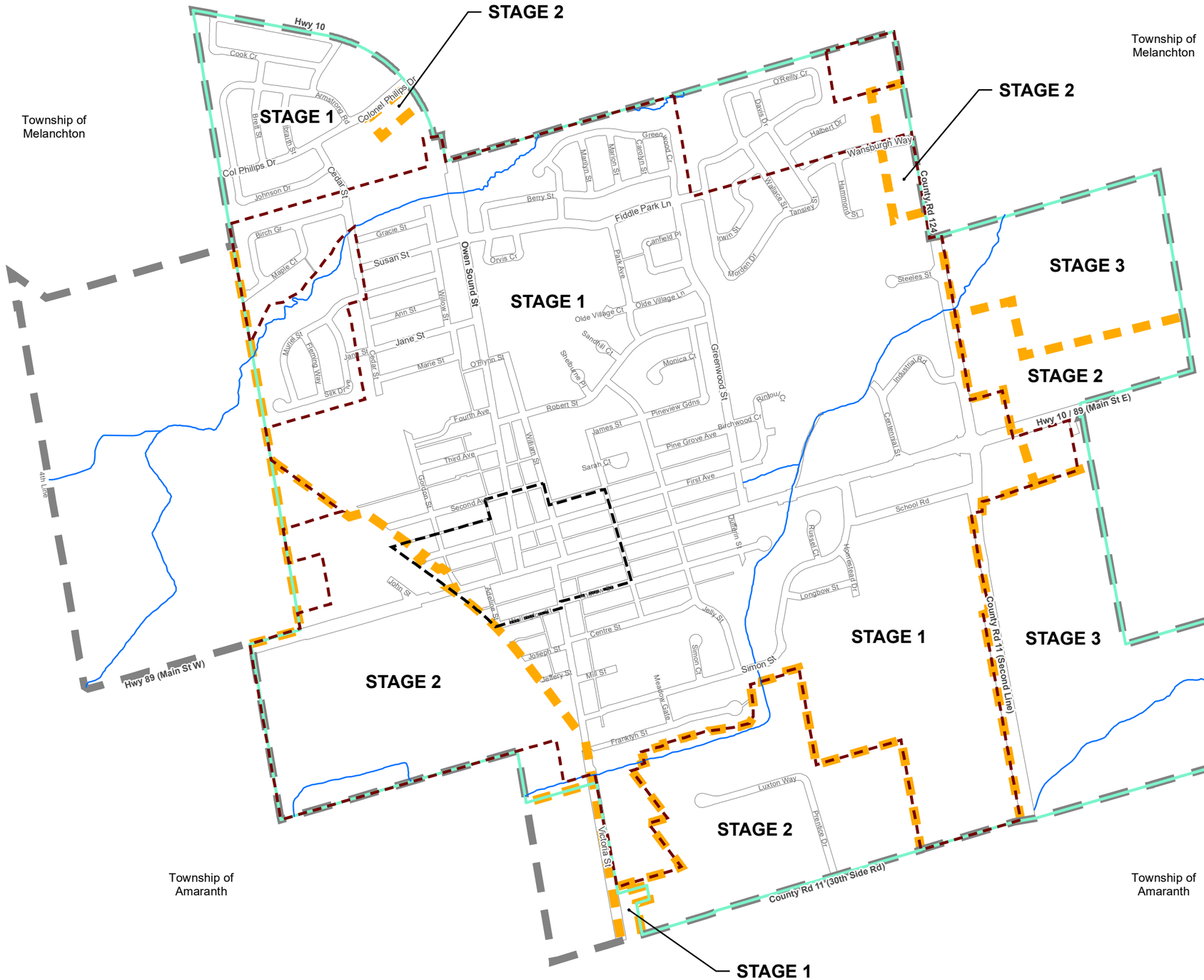
Denyse Morrissey, CAO

Appendix 1 to DO 2021-02

TOWN OF SHELBURNE OFFICIAL PLAN

SCHEDULE 'B1'

DEVELOPMENT STAGING PLAN



Development Staging

- Staging Boundary

Urban Structure Boundaries

- Downtown Core
- Built Boundary
- Urban Area
- Town Boundary

Base Features

- Watercourses
- Streets, Lanes, and Corridors

0 100 200 300 400 500 Meters

1:12,500

N W E S

This map only provides graphical illustrations and data for planning purposes. Legal property data and descriptions, detailed engineering data, CAD drawings and other data should be used when greater accuracy is required for design or other purposes.

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RESIDENTIAL ALLOCATIONS					
Development Area	**Status**	**Units**	**Units Allocated**		
			Stage 1	**Stage 2**	**Stage 3**
Built-Up Area	Severances/Infill/Conversions Approved	14	14		
600 Main St. E.	Draft Plans Approved	58	58		
Hyland Village*	Approved / Under Construction	178		178	
Stoneridge Ph. 1	Draft Plans Approved	33		33	
Fieldgate	Draft Plan Approved	257			257
TOTAL RESIDENTIAL ALLOCATED		**540**	**72**	**211**	**257**

*NOTE: Hyland Village subdivision 245 units with 178 units remaining unbuilt / unoccupied as of Dec. 31, 2020

INDUSTRIAL / COMMERCIAL / INSTITUTIONAL (ICI) ALLOCATIONS					
Development Area	**Status**	**GFA (Ha)**	**GFA (Ha) Allocated**		
			Stage 1	**Stage 2**	**Stage 3**
BMP Expansion	Approved with Conditions	0.37	0.37		
301 Col. Phillips Dr.	Approved / Under Construction	0.19		0.19	
147 Luxton Way	Approved / Under Construction	0.21		0.21	
IRS – 108 Prentice Dr.	Approved / Under Construction	0.96		0.96	
Turnstone Phase 1C	Approved / SP Amendment Received	0.20		0.20	
TOTAL ICI ALLOCATED		**1.93**	**0.37**	**1.57**	**-**

NET REMAINING CAPACITY (UNALLOCATED): 79 M3/DAY = 94 UNITS OR 2.83 HA GFA

RESIDENTIAL DEMANDS					
Development Area	**Status**	**Units**	**Units Allocated**		
			Stage 1	**Stage 2**	**Stage 3**
Downtown / Infilling	Varies – in process, proposed, potential	31	31		
124 Owen Sound St.	Application received / in process	44	44		
416-428 Main St. W.	Application received / in process	190		190	
501 Main St. W.	Application received / in process	74		74	
501 Main St. W. Ph. 2	Proposed / future block on Draft Plan	50		50	
Stoneridge Ph. 2	Proposed / future block on Draft Plan	15		15	
Fieldgate Ph. 2	Proposed / future block on Draft Plan	75			75
Flato / Expansion Area	Pre-consultation / requires OPA	93			
TOTAL RESIDENTIAL DEMANDS		**572**	**75**	**329**	**75**

INDUSTRIAL / COMMERCIAL / INSTITUTIONAL (ICI) DEMANDS					
Development Area	**Status**	**GFA (Ha)**	**GFA (Ha)**		
			Stage 1	**Stage 2**	**Stage 3**
Fieldgate Commercial	Application received / in process	0.63		0.63	
BMP	Additional effluent capacity requested	-			
Industrial Park	Varies – pre-consultation / proposals	2.59		2.59	
Industrial Expansion	Designated and zoned / pre-consultation	3.42	0.92	2.50	
Commercial	Designated and zoned / future phases	2.36	0.48	1.88	
Institutional	Designated and zoned / pre-consultation	0.37	0.37		
Flato / Expansion Area	Pre-consultation / requires OPA	0.18			
TOTAL ICI DEMANDS		**9.56**	**1.77**	**7.60**	**-**

REMAINING CAPACITY (UNALLOCATED)	RESIDENTIAL	ICI
Capacity (80% Residential, 20% ICI)	75 units	0.57 Ha
Future Demands Estimate	572 units	9.56 Ha
RESERVE CAPACITY AFTER DEMANDS (SHORTFALL)	**(497 units)**	**(8.99 Ha)**

TOWN OF SHELBURNE

WASTEWATER TREATMENT CALCULATION OF REMAINING SERVICING CAPACITY, CURRERNT ALLOCATIONS AND DEMANDS

Last Updated: 2021-02-28

					Flow Est. (m^3/day)	**Total Wastewater (m^3/day)**
Avg. Rated Wastewater Treatment Plant Capacity						**3420**
Subtract 3-Year Average Day Flow					2613	
Remaining Wastewater Capacity						**807**
Contingencies:						
Same Year Occupancies	70	Residential Units		83%	49	
Existing Dwellings on Private Septic Systems	66	Residential Units			56	
Existing ICI on Private Septic Systems	0.08	ha of Gross Floor Area			2	
Stablization of Flows					150	
Total Contingencies					**257**	
Net Remaining Capacity After Contingencies						**550**

Service Allocated (Committed): - see Note 1	**Residential**			**ICI**		**Total Res. & ICI Flow Est. (m^3/day)**
	Residential Units	**Population Estimate**	**Flow Est. (m^3/day)**	**Gross Floor Area (ha)**	**Flow Est. (m^3/day)**	
STAGE 1 AREA	72	202	51	0.37	1	51
STAGE 2 AREA	211	666	167	1.56	39	205
STAGE 3 AREA	257	858	214	0.00	0	214
Total Allocated	540	1727	432	1.93	39	**471**
Net Remaining Capacity After Allocations						**79**
	75	Residential Units	AND	0.57	Ha of ICI Gross Floor Area	
Demands (Uncommittted): - see Notes 1, 2						
STAGE 1 AREA	75	151	38	1.77	150	187
STAGE 2 AREA	329	991	248	7.60	180	428
STAGE 3 AREA	75	209	52	0.00	0	52
STAGE 4/EXPANSION AREA	93	279	70	0.73	20	90
Total Demand	572	1629	407	10.10	351	**758**
Net Remaining Capacity After Demands						**-679**

Assumptions:		
Average Household Size	3.38	persons per unit
Average Household Size - Single/Semi-Detached	3.48	persons per unit
Average Household Size - Townhouse/Rowhouse	2.78	persons per unit
Average Household Size - Apartments	1.57	persons per unit
Average Per Capita Wastewater Generation	0.250	m^3 per person per day
Average Per Household Wastewater Generation	0.845	m^3 per household per day
Average ICI Wastewater Generation (see Note 3)	28	m^3/day/hectare of GFA

NOTES:

1. Refer to Official Plan Schedule ‘B1’ - Development Staging Plan.
2. Servicing Allocation to any development proposal shall be determined at the time of development approval.
3. Some properties have agreements with water use restrictions which have been uses to estimate ICI wastewater generation

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

March 9, 2021

Jim Moss
Town of Shelburne
203 Main Street East
Shelburne, ON L9V 3K7

Attn: Jim Moss, Director of Development and Operations

Re: Town of Shelburne
Sewage Capacity Allocation Year End 2020
SBA File: M16008.9

Dear Mr. Moss,

As requested, S. Burnett & Associates Limited (SBA) has prepared the following Sewage Capacity Allocation Summary for the year end of 2020 based on available flow data for the year. This report has been completed to update the sewage capacity allocation with 2020 data.

Current Water Pollution Control Plant (WPCP) Treatment Capacity

The Town of Shelburne is currently serviced by a tertiary water pollution control plant (WPCP). The WPCP has an average day flow rated capacity of 3,420 m^3/d and a peak rated capacity of 8,921 m^3/d.

Current Wastewater Generation

Table 1 summarizes data collected from 2007 to 2020 for population, total annual sewage flow, maximum daily flow, average flow and corresponding per capita sewage generation. It should be noted that these values include both residential and industrial, commercial, and institutional (ICI) waste generation rates and therefore the per capita flow is equivalent of residential and ICI combined.

As shown in **Table 1**, wastewater average daily flow rates have generally trended downward from 2009 to 2013 and stabilized from 2014 to 2016, despite the population steadily increasing. The 2017 data showed a significant increase in average daily flow rates as well as in per capita flows. The increases seen in 2017 were partially attributed to above average precipitation however, the increased average flows and per capita demand have continued through to 2020. The increased per capita flow from 2017 to 2020 is generally in line with per capita rates experienced in 2013 and 2014 and is still much lower than the

per capita flows experienced from 2007 to 2011. This would suggest that the water metering program and the sewage system infiltration improvements occurring with new infrastructure being installed in the newer portions of Town, as well as the effort to complete rehabilitation work in the older sections to reduce infiltration and extraneous flows is working well.

Table 1: Population and Sewage Flow Rates

Year	Population[2]	Total Annual Sewage Flow (m^3)	Maximum Daily Sewage Flow (m^3/d)	Average Daily Sewage Flow (m^3/d)	Average Per Capita Sewage Flow ($m^3/p/d$)
2007	5281	717,849	7,862	1,967	0.372
2008	5417	861,675	4,726	2,354	0.435
2009	5556	945,509	5,398	2,590	0.466
2010	5699	827,658	4,170	2,268	0.398
2011	5846	872,518	4,445	2,390	0.409
2012	6244	878,586	3,604	2,112	0.338
2013	6669	789,095	4,430	2,154	0.323
2014	7123	833,530	4,133	2,282	0.320
2015	7608	764,817	4,150	2,094	0.275
2016	8126	823,773	4,285	2,252	0.277
2017	8155	930,343	4,922	2,544	0.312
2018	8176	905,276	4,468	2,480	0.303
2019	8354	949,202	6,376[1]	2,601	0.311
2020	8639	1,010,183	8,228[1]	2,758	0.319

[1] *The OCWA operations staff has developed a new methodology to calculate raw water flows entering the WPCP more accurately. This methodology was used to determine the maximum day sewage flow for 2019 and 2020 and explains the significant increase from 2018. SBA is currently reviewing and recalculating flow values for the previous years. This methodology will likely increase the maximum values for the years preceding 2019.*

[2] *Population and corresponding average per capita values were updated for years 2012 to 2019 based on updated numbers provided in the 2020 Development Charges Study.*

The wastewater average daily flow increase seen maintaining through 2020 are attributed to the increase in population but have also been impacted by COVID-19. Although the full effect of COVID-19 may not be easily determined the increased per capita demand was somewhat expected given the work-from-home orders in place through much of 2020. The increased per capita demand factor seen from 2017 to 2020 suggests increased water consumption rates. This may be indicative of reduced effectiveness of the water metering program encouraging conservation of water amongst consumers.

As indicated, the average wastewater usage presented above includes ICI flows therefore, to determine the per capita residential wastewater generation, the ICI flows must be deducted from the overall average wastewater generation. The Town of Shelburne implemented a water meter program for all residential water consumers and the remaining not metered ICI consumers connected to the Town water system. The program began in 2010 and was completed in July of 2011. This allows the Town to accurately determine the water used by both residential and ICI consumers for calendar years 2012 and beyond.

Table 2 shows the water consumption for residential and ICI for the years 2012 through to 2020. To determine the ICI percentage of metered water, the average ICI metered consumption is compared to the total metered consumption. The wastewater flow for ICI consumers was then computed by multiplying the percentage of the total ICI water consumed, times the total average daily wastewater generation for the respective year. The results are provided in **Table 3**. Although the ICI ratio of consumption has remained fairly consistent from 2012 to 2019, the 2020 ratio was slightly lower at 21.6% which is potentially indicative of lower ICI rates and higher residential rates with some businesses closed or running under less capacity during COVID-19 for 2020.

Table 2: Water Consumption (Metered)

Line	Measurement Type	Measurement (m^3/day)								
		2012	2013	2014	2015	2016	2017	2018	2019	2020
(1)	Average Consumption for all Metered Users	1369	1303	1436	1522	1615	1616	1673	1710	1853
(2)	Average Consumption Metered ICI	354	317	370	358	387	387	373	407	400
(3)	ICI Percentage (2)/(1)x100	25.8%	24.3%	25.8%	23.5%	23.9%	24.0%	22.3%	23.8%	21.60%

Table 3: ICI Wastewater Generation

Line	Year	Average Wastewater Generation (m^3/d)	Average ICI of Metered Water Supply (%)	Average Daily ICI Wastewater Generation (m^3/d)
(1)	2009	2593	18	467
(2)	2010	2266	18	408
(3)	2011	2380	18	428
(4)	2012	2111	25.8	545
(5)	2013	2154	24.3	523
(6)	2014	2282	25.8	589
(7)	2015	2094	23.5	492
(8)	2016	2252	23.9	538
(9)	2017	2544	24	611
(10)	2018	2,480	22.27	552
(11)	2019	2,601	23.82	619
(12)	2020	2,758	21.60	596

The average residential wastewater generation rate was computed by deducting the average daily ICI wastewater generation rate provided in **Table 3** above, from the total average wastewater generation rate. Dividing the average residential wastewater generation rate by the serviced residential population determines the average per capita residential wastewater generation rate. A summary of the residential wastewater generation is presented in **Table 4** below.

Table 4: Residential Wastewater Flows

Year	Population[2]	Serviced Population [1]	Average Daily Sewage Flow (m^3)	Average Daily ICI Sewage Flow (m^3)	Residential Daily Sewage Flow (m^3)	Residential Per Capita Flow ($m^3/p/d$)
2007	5281	5102	1,967	354	1613	0.316
2008	5417	5238	2,354	424	1930	0.368
2009	5556	5377	2,590	467	2123	0.395
2010	5699	5520	2,268	408	1860	0.337
2011	5846	5667	2,390	428	1962	0.346
2012	6244	6065	2,112	545	1,567	0.258
2013	6669	6490	2,154	523	1,631	0.251
2014	7123	6944	2,282	589	1,693	0.244
2015	7608	7429	2,094	492	1,602	0.216
2016	8126	7947	2,252	538	1,714	0.216
2017	8155	7976	2,544	611	1,933	0.242
2018	8176	7984	2,480	552	1,928	0.236
2019	8354	8162	2,601	619	1,981	0.237
2020	8639	8447	2,758	596	2,162	0.250

[1] *Years 2018 to 2020 had 66 houses not serviced and a housing density of 2.91 resulting a non-serviced population of 192. For years 2007 to 2018 a non-serviced population of 179 was used.*

[2] *Population and corresponding average per capita values were updated for years 2012 to 2019 based on updated numbers provided in the 2020 Development Charges Study.*

As shown in the above table, the residential per capita flow rate has general decreased from 2012 to 2016. A notable increase occurred in 2017, however residential per capita demands have remained stable and slightly below the 2017 value through 2018 and 2019. It should be noted that these rates remain lower than rates experienced pre-2012. This can be attributed to several initiatives implemented by the Town. The first was the introduction of universal water metering which began in 2010 and was completed by July 2011. The initial results of this reduction in flows would have been experienced in late 2011 but 2012 would have been the first full year to experience these reductions. Also, in 2011 a sewer refurbishment program was started on the "Sister Streets" in Shelburne. The program included French drains installed below the sanitary sewer system to help mitigate the inflow and infiltration of the sewers in this residential area. This program has now been completed and appears to have reduced the inflow and filtration in the area. The third contributing factor has been a system wide initiative to identify any suspect infiltration leaks or inputs and to isolate and repair these areas. This is an ongoing program which has identified several contributing point sources that have been repaired or rectified.

The increased per capita rate in 2017 was partially caused by wet weather conditions but these increased per capita demands have extended into 2018 and 2019. This increased usage may be the result of reduced conservation measures by consumers. When water meters were first installed initial conservation measures would have been significant and could be reducing over time. Several studies have shown that the initial decline in water use can be substantial pushing anywhere from 20 - 30% reductions and then eventually stabilize in the 15 - 20% range. It should also be noted that the rebound or increase has moved up to approximately 237 L/p/day, but this rate is still lower than the 265 L/p/day rate which has been used to project future connections. Notably, 265 L/p/d was the per capita rate previously recorded for 2012 however due to updated population values this have been adjusted to 258 L/p/d. As mentioned previously, this maintained reduction as compared to previous years before infiltration initiatives were implemented confirms that this program is working and should be continued.

A significant increase in the residential per capita rate has been noted in the 2020 data. The per capita rate of 250 L/cap/d is higher than the spike seen in 2017 and approximately equal to per capita values seen in 2012 and 2013. The increase in the 2020 data can be attributed to the effects of the COVID-19 pandemic. The lockdown has prevented many residents from commuting to workplaces outside of Shelburne due to stay-at-home restrictions. Consequently, wastewater that would typically be produced outside of Shelburne is now being generated in Shelburne by the residents now working from home.

Averaging the data from 2007 to 2020 results in a residential per capita flow of 0.279 m^3/p/d. and a current 5-year average of 0.236 m^3/p/d. However, a more appropriate rate is using the highest average over the past five (5) years following the implementation of the above measures which results in an average per capita flow rate of 0.250 m^3/p/d. Previous allocations have used a per capita value of 265 L/cap/d however as the residential per capita appears to have stabilized from 2017 to 2020 SBA has revised the residential per capita flow rate to 0.250 m^3/p/d for the purposes of this sewage allocation review. Based on this residential per capita flow rate and the updated housing density of 3.38 persons per home this corresponds to an existing unit flow rate of 0.845 m^3/home/d.

The results of water metering, improvements to the collection systems and the implementation of the French drains below the water system appear to be showing positive results. **Table 5** shows the average sewage flows experienced by the WPCP from 2007 to 2020 and the corresponding 3- and 5-year averages utilized in the MECP Procedure D-5-1 for sewage allocation. Although the average daily sewage flows were generally decreasing from approximately the year 2011 when most of these measures were implemented this has increased significantly from 2017-2020. This can be attributed to the increased population, wet weather conditions and potentially reduced conservation effects from the water metering program. The 2020 increase is the result of residents working from home as a result of the COVID-19 pandemic. This has resulted in a 5-year average daily sewage flow rate of 2,527 m^3/day and a 3-year average of 2,613 m^3/d. As previously suggested would occur, the 3-year average is now consistently above the 5-year average. This is mainly due to the fact that significant improvements in the infiltration and extraneous flows are

starting to become less of a factor for flow increases during high groundwater and storm events and the increased population is becoming more of a factor for the flows. Based on this and similar to 2019, the 3-year average has been used as the basis for this report as the more conservative value.

Table 5: Average Sewage Generation Including 3- and 5-Year Averages

Year	Population[2]	Serviced Population [1]	Average Daily Sewage Flow (m^3/d)	3-Year Average Daily Sewage Flow (m^3/d)	5-Year Average Daily Sewage Flow (m^3/d)
2007	5281	5102	1,967	-	-
2008	5417	5238	2,354	-	-
2009	5556	5377	2,590	2,304	-
2010	5699	5520	2,268	2,404	-
2011	5846	5667	2,390	2,416	2,314
2012	6244	6065	2,112	2,257	2,343
2013	6669	6490	2,154	2,219	2,303
2014	7123	6944	2,282	2,183	2,241
2015	7608	7429	2,094	2,177	2,206
2016	8126	7947	2,252	2,209	2,179
2017	8155	7976	2,544	2,297	2,265
2018	8176	7984	2,480	2,425	2,330
2019	8354	8162	2,601	2,542	2,394
2020	8639	8447	2,758	2,613	2,527

[1] *Years 2018 to 2020 had 66 houses not serviced and a housing density of 2.91 resulting in a non-serviced population of 192. For years 2007 to 2018 a non-serviced population of 179 was used.*

[2] *Population and corresponding average per capita values were updated for years 2012 to 2019 based on updated numbers provided in the 2020 Development Charges Study.*

Sewage Capacity Allocation

The analysis presented above was utilized to update the current sewage capacity allocation for the Town of Shelburne based on 2020-year end data. The calculation summary table has been attached to this executive summary letter. The updated summary table has been developed by both GSP and SBA to accurately summarize the committed allocations and uncommitted reserves compared with future servicing demands in each development staging area identified in the Official Plan.

Adjustments from Previous Allocation Reports

The following adjustments have been made to the sewage allocation study compared to previous reports:

- An allowance for 70 same year occupancies has been established for this report. Most of these units (67 units) are in the Hyland subdivision and were occupied between June and December 2020. An allowance has been included for November and December where most of these units were fully occupied and accounted for thin the flows.
- An allowance has been maintained for the existing residential units and existing ICI on private systems consistent with previous reports.
- The contingency allowance for stabilization of flows has been set at 150 m^3/day which is consistent with reports prior to the 2019 report. Although the allowance was reduced to 75 m^3/day in 2019 the current flow rates and effects of COVID have indicated that this allowance is not sufficient and the originally utilized allowance of 150 m^3/day has been maintained.
- The residential per capita demand has been revised from 0.242 m^3/p/d to 0.250 m^3/p/d. This revised value reflects the highest average per capita demand seen over the last 5-years.
- Similar to the 2019 report, estimated flows have been based on the 3-year average as it is now consistently above the 5-year average due to the heavy population growth in recent years.
- Similarly, to the 2019 Report, the 2020 report uses the 2020 Development Study forecasted the densities for proposed developments. The proposed densities shown below were used to project allocated and reserved demands.
    - Average Household Overall: 3.38 persons per unit.
    - Average Household Single / Semi-Detached: 3.48 persons per unit.
    - Average Household Townhouse/Rowhouse: 2.78 persons per unit.
    - Average Household Apartments: 1.57 person per unit (or the household size assumed by the related servicing report/analysis submitted by the applicant based on the type and size of apartments proposed, whichever is higher.)
- For allocated and reserve ICI lots without service agreements the MECP factor of 28 m^3/day/ha was used to forecast demands. For ICI lots with agreements the demand in the agreement was used.

Allocation Summary Key Factors

The following is a summary of the key factors and calculated parameters that were utilized in the analysis:

- Rated WPCP capacity is 3420 m^3/day.

- The 3-year average sewage flow as per MOECC Procedure D-5-1 is 2,613 m^3/day.
- ICI generation for reserve and allocated lots was assumed equal to 28 m^3/day/ha unless a servicing agreement established a different demand value.
- The current per capita flow rate has been set at 0.250 m^3/p/day.
- The proposed housing densities listed above were used to project allocated and reserved residential demands based on the per capita factor of 0.250 m^3/p/day.

Allocation Summary Conclusions

The following is a summary of the conclusions from the allocation summary table:

- As shown in the attached allocation table the existing system has sufficient capacity to service all existing and allocated lots with a surplus of 79 m^3/d. This leaves capacity for roughly 75 additional residential units and 0.57 ha of additional ICI development at a 80/20 split.
- The existing system does not have capacity for all Demand (uncommitted) developments. Based on reserve lots currently being projected for the future; the existing system is undersized by 679 m^3/d which amounts to 572 residential units and 10.10 ha of ICI development in Stages 1,2,3 and 4/Expansion Area.

Currently the Town has several developments and files in process which are included in Stage 1, 2 and 3 areas which are currently or will be soon applying for allocation. Based on this assessment, it is our opinion that additional development can only be considered up to 79 m^3/d (75 additional residential units and 0.57 ha of additional ICI development). GSP and SBA have worked together with the Director of Development and Operations to estimate future demands for wastewater capacity based on active development applications, proposals and redevelopment potential in the Stage 1, 2 and 3 areas and one proposal for development in the future west expansion area. Given that the servicing demands significantly exceed the remaining uncommitted capacity, further development approvals must be carefully prioritized to determine which developments or parts thereof can be serviced within the existing rated capacity of the WPCP and which will be dependent on the re-rating and upgrading of the WPCP. This may include a phasing approach to all developments currently seeking allocation.

Based on the results of this assessment and the current demand for allocation, it is clear that the WPCP will need to be upgraded and rerated to satisfy the current developments seeking allocation as well as future developments identified within the Stage 1, 2, and 3 areas as well as the west expansion area.

We trust that this report and summary meets with your approval. Should you have any questions, please do not hesitate to contact us. Both SBA and GSP representatives will attend the next Council meeting to address any specific questions related to this report.

Yours truly,

Stephen Burnett, P.Eng.
Principal
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Incl.

cc: Steve Wever, GSP Group Inc.
Denyse Morrissey, CAO, Town of Shelburne

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