



**TRITON  
ENGINEERING  
SERVICES  
LIMITED**

Consulting Engineers

105 Queen Street West, Unit 14  
Fergus  
Ontario N1M 1S6  
Tel: (519) 843-3920  
Fax: (519) 843-1943  
Email: info@tritoneng.on.ca

ORANGEVILLE • FERGUS • HARRISTON

April 21, 2023

Township of Southgate  
R.R. #1  
185667 Grey Road 9  
Dundalk, Ontario  
N0C 1B0

ATTENTION: Jim Ellis,  
Public Works Manager

RE: Township of Southgate  
Dundalk Water Supply and  
Sewage Treatment Systems  
2023 Reserve Capacity Calculations  
Our File: A4160(23)-R04

Dear Sir:

The attached tables outline the 2023 reserve capacity calculations for the water supply and sewage treatment systems in Dundalk. The reserve capacities have been calculated in accordance with Ministry of Environment and Conservation and Parks (MECP) guidelines. 178 new residential units were occupied within the municipal systems of Dundalk in 2022.

Table 3 provides a summary of Committed Developments which include White Rose Phases 1, 2 and 3, the Flato West Apartment Building, Flato Phases 3-8, 10 and 11, Flato Glenelg Phase 1, totalling **562** equivalent residential units (ERUs). As Committed Units, these ERUs will not come out of the Uncommitted Reserve Capacity figures indicated on Table 1 and Table 2. Table 3: *Uncommitted Developments* further outlines the various potential developments that have been granted Draft Plan Approval, or are being considered, however have not been granted allocation.

**Water System:**

The three (3) year average maximum day demand of the water system increased from 941m<sup>3</sup>/d to **1,008m<sup>3</sup>/d** over the past year. The 2023 uncommitted reserve capacity of the water system is **2,158 ERU**. This is based on the Townships' amount of water taking permitted by the Permit to Take Water and committed developments as outlined in Table 3. The Permit to Take Water, indicates an allowable water taking of 2,817m<sup>3</sup>/day.

Refer to Table 1 for additional information regarding water system reserve capacity calculations.

### **Sewage Treatment Facility:**

Table 2 summarizes the sewage treatment reserve capacity calculations for 2023. The three-year annual average day flow decreased from 1,165 m<sup>3</sup>/d to **1,124m<sup>3</sup>/d**. Despite an increase in the serviced population in 2022, the 2023 uncommitted reserve capacity for the sewage treatment facility has increased from 182 ERUs to **343** new development ERUs. The increase in available reserve capacity is a result of reduced flows to the treatment facility, and due to an additional reduction in the expected ERU flow rate. The reduce flow rate is supported by on-going review and monitoring which justified a per person flow rate of 300 Litres per person per day, within Ministry recommended limits.

Refer to Table 2 for additional information regarding sewage treatment system reserve capacity calculations.

### **Extraneous Flow:**

In conjunction with the reserve capacity calculations, we have completed a high-level assessment of the extraneous flows within the Dundalk sewage collection system. This assessment compares the precipitation, temperature, average day demand of water and the average day sewage flow measured at the WWTP on a monthly basis. The results indicate that the annual extraneous flows are within expected limits. However, there is a significant relationship between the wastewater flows and temperature increase, indicative of a system that is subject to groundwater infiltration. This is based on peaking of wastewater flows noted during the spring melt (i.e., March). Sump pump connections are likely a significant contributor.

### **Recommendation:**

Following Council's review and adoption of the attached report, we would recommend that a copy of the report be forwarded to the MECP District Office in Owen Sound and the Grey County Planning Department. We trust you will find the enclosed to be in order. Should you have any questions, please do not hesitate to contact this office.

Respectfully,  
Triton Engineering Services Limited



Dustin Lyttle, P. Eng.

cc: Dina Lundy, Township of Southgate  
Clinton Stredwick, Township of Southgate  
Bev Fisher, Township of Southgate

**TABLE 1  
TOWNSHIP OF SOUTHGATE  
2023 RESERVE CAPACITY  
DUNDALK WATER SYSTEM**

DESCRIPTION	2022
1 Available Capacity <sup>1</sup>	2,817
2 Max Day Demand (m <sup>3</sup> /d) <sup>2</sup>	1,008
3 Reserve Capacity (m <sup>3</sup> /d) (1) - (2)	1,809
4 Serviced Occupied Households <sup>3</sup>	1,487
5 Persons Per Existing Residential Unit (2021 Census Data)	2.66
6 Population Served (4) x (5)	3,955
7 Maximum Day Per Capita Demand (m <sup>3</sup> /d) (2) ÷ (6)	0.255
8 Additional Population that can be Served (3) ÷ (7)	7,099
9 Person Per New Equivalent Residential Unit (2022 DC Background Study)	2.61
10 Additional ERUs that can be served. (8) ÷ (9)	2,720
11 Committed Development ERUs (Table 3)	562
<b>12 Uncommitted Reserve Capacity (ERUs) (10) - (11)</b>	<b>2,158</b>
<sup>1</sup> Available Capacity is based on lesser of Firm Capacity or Permit to Take Water. Firm capacity is 2,819m <sup>3</sup> /day, PTTW is 2,817m <sup>3</sup> /d. Well Production is 4,780m <sup>3</sup> /day.	
<sup>2</sup> Max day demand is the average of the maximum day demands from 2020, 2021 and 2022 (905, 1,004 and 1,444m <sup>3</sup> /d respectively). Maximum day demands have been adjusted to account for high demands during various infrastructure works or watermain breaks.	
<sup>3</sup> Serviced occupied households as reported in the 2022 Water Report.	

**TABLE 2  
TOWNSHIP OF SOUTHGATE  
2023 RESERVE CAPACITY  
DUNDALK SEWAGE TREATMENT FACILITY**

DESCRIPTION	2022
1 Design Capacity of Sewage Treatment Facility (m <sup>3</sup> /d)	1,832
2 Average Day Flow <sup>1</sup> (m <sup>3</sup> /d) (Average of 2019, 2020 and 2021 Average Day Flows)	1,124
3 Reserve Capacity (m <sup>3</sup> /d) (1) - (2)	708
4 Average New Development Per Capita Flow <sup>2</sup> (m <sup>3</sup> /d)	0.300
5 Additional Population that can be Served (3) ÷ (4)	2,361
6 Person Per Equivalent Residential Unit (2022 DC Background Study)	2.61
7 ERU Flow Rate (m <sup>3</sup> /d) (4) x (6)	0.783
8 Additional ERUs that can be Served (5) ÷ (6)	905
9 Committed Development ERUs (Table 3)	562
<b>10 Uncommitted Reserve Capacity (ERUs) (7) - (8)</b>	<b>343</b>
<sup>1</sup> Average of the average day flows in 2020, 2021 and 2022 (1,161m <sup>3</sup> /day and 1,220m <sup>3</sup> /day and 990m <sup>3</sup> /day respectively).	
<sup>2</sup> As determined by new development flow analysis supported by flow monitoring program.	

**TABLE 3  
TOWNSHIP OF SOUTHGATE  
2023 RESERVE CAPACITY  
SUMMARY OF DUNDALK DEVELOPMENTS**

<b>COMMITTED DEVELOPMENTS</b>	<b>TOTAL UNITS</b>	<b>UNITS OCCUPIED IN 2022</b>	<b>REMAINING UNITS AT END OF 2022</b>
White Rose (Phase 1 & 2)	66	3	0
White Rose (Phase 3) <sup>1</sup>	30	0	30
Flato West Block 75 Apartment Building <sup>2</sup>	56	21	35
Flato North (Phase 3)	46	4	0
Flato North (Phase 4)	22	22	0
Flato North (Phase 5)	59	49	0
Flato North (Phase 6)	68	48	0
Flato East (7, 8 & 10)	188	0	188
Flato East (Phase 11) <sup>3</sup>	123	0	123
Flato East (Phase 11 - Block 344)	29	0	29
Glenelg (Phase 1)	183	31	152
ANNUAL INFILL LOTS <sup>4</sup>	5	0	5
<b>SUB-TOTAL</b>		<b>178</b>	<b>562</b>
<b>TOTAL COMMITTED UNITS</b>			<b>562</b>
<b>UNCOMMITTED DEVELOPMENT</b>	<b>TOTAL UNITS</b>		
White Rose (Phase 3)	47		
Flato East (Phase 9)	47		
Flato East (Phase 11)	50		
Glenelg (Phase 2)	155		
Glenelg (Phase 3)	459		
Flato North West	250		
<b>SUB-TOTAL</b>	<b>1,008</b>		
<sup>1</sup> Partial allocation (30 of 77) of White Rose (Phase 3). 47 remain unallocated.			
<sup>2</sup> Apartment units based on assumption that each unit is 0.7 ERU.			
<sup>3</sup> Partial allocation (152 of 173) of Flato East (Phase 11). 50 remain unallocated.			
<sup>4</sup> 5 ERUs designated annually for residential infill Lots.			

**TABLE 4  
TOWNSHIP OF SOUTHGATE  
2023 RESERVE CAPACITY  
DUNDALK EXTRANEOUS FLOWS**

MONTH	PRECIPITATION (mm) <sup>4</sup>	AMBIENT TEMP. (C°) <sup>4</sup>	WASTEWATER ADF (m <sup>3</sup> /day)	WATER ADD (m <sup>3</sup> /day)	EXTRANEOUS FLOW (m <sup>3</sup> /day) <sup>1</sup>
January-2022	31.0	-10.6	967	779	188
February-2022	95.6	-7.4	1,239	837	402
March-2022	81.5	-1.2	2,063	727	1,336
April-2022	69.0	4.7	1,639	721	918
May-2022	52.6	14.6	1,006	742	264
June-2022	53.4	16.8	820	813	0
July-2022	65.8	19.2	606	794	-188
August-2022	110.9	19.2	621	821	-200
September-2022	66.9	15.4	608	775	-167
October-2022	46.8	8.8	674	772	-98
November-2022	55.3	3.5	688	721	-33
December-2022	88.0	-2.6	949	861	88
<b>AVERAGE</b>			<b>990</b>	<b>780</b>	<b>209</b>
<b>REASONABLE EXTRANEOUS FLOW BASED ON POPULATION(m<sup>3</sup>/day)<sup>2</sup></b>					<b>237</b>
<b>EXTRANEOUS FLOW OVER AND ABOVE REASONABLE AMOUNT(m<sup>3</sup>/day)</b>					<b>0</b>
<b>EQUIVALENT RESIDENTIAL UNITS USED BY EXTRANEOUS FLOWS (ERU)<sup>3</sup></b>					<b>0</b>

<sup>1</sup> This is the Wastewater ADF minus the Water ADD, used to determine Sanitary Flow over and above expected.

<sup>2</sup> Expected infiltration is 60 Litres per person per day based on modified historic MOE Standard.

<sup>3</sup> Based on New Development Equivalent Residential Unit Sanitary Flow Rate.

<sup>4</sup> Data as available for the nearest Weather Station (Environment Canada - Daily Data Report Mount Forest).

