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ORANGEVILLE • FERGUS • HARRISTON

March 22, 2024

Township of Southgate
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
2024 Reserve Capacity Calculations
Our File: A4160(24)-R04

Dear Sir:

The attached tables outline the 2024 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. **228** new residential units were occupied within the municipal systems of Dundalk in 2023.

Table 3 provides a summary of Committed Developments which include White Rose Phase 3, the Flato West Apartment Building, Flato Phases 7-8, 10 and 11, Flato Glenelg Phase 1, totalling **408** 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 may or may not 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 1,008m³/d to **1,180m³/d** over the past year. The 2024 uncommitted reserve capacity of the water system is **1,714 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 2,817m³/day.

The Dundalk water system is a single pressure zone watermain distribution network that includes one newly constructed elevated water tower, one on-grade reservoir, three supply wells and the necessary

reservoirs required to achieve Chlorine Contact time. The current storage volume requirement is **1,539m³** which is below the system storage volume currently available of 5,360m³. Note: This current volume does include the reservoir at D3 (1,365m³).

The storage volume required to support the committed developments noted in Table 3 indicates that the existing available storage is expected to be sufficient to service the committed developments.

Refer to Table 1.0 and Table 1.1 for additional information.

Sewage Treatment Facility:

Table 2 summarizes the sewage treatment reserve capacity calculations for 2024. The three-year annual average day flow increased from 1,124 m³/d to **1,149m³/d**. Despite an increase in the serviced population in 2022, the 2024 Uncommitted Reserve Capacity for the sewage treatment facility has increased from 343 ERUs to **464** new development ERUs. The increase in available reserve capacity is a result of the number of occupied units increasing at a rate greater than the flow rate increasing.

The Dundalk Wastewater Treatment Facility expansion project is currently in the detailed design stage and is expected to increase the sewage treatment capacity to 3,025m³/day. The expectation is that this project will be tendered in 2024.

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 and yearly basis. The results indicate that the extraneous flows over and above the expected amount within a typical system is subject to some extraneous flow during the fall, winter and spring, with significant relationship between the wastewater flows and temperature increase. This is 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., April). 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
Bev Fisher, Township of Southgate

**TABLE 1
TOWNSHIP OF SOUTHGATE
2024 RESERVE CAPACITY
DUNDALK WATER SYSTEM**

DESCRIPTION	2023
1 Available Capacity ¹	2,817
2 Max Day Demand (m ³ /d) ²	1,180
3 Reserve Capacity (m ³ /d) (1) - (2)	1,637
4 Serviced Occupied Households ³	1,501
5 Persons Per Existing Residential Unit (2021 Census Data)	2.66
6 Population Served (4) x (5)	3,993
7 Maximum Day Per Capita Demand (m ³ /d) (2) ÷ (6)	0.296
8 Additional Population that can be Served (3) ÷ (7)	5,539
9 Person Per New Equivalent Residential Unit (2022 DC Background Study)	2.61
10 Additional ERUs that can be served. (8) ÷ (9)	2,122
11 Committed Development ERUs (Table 3)	408
12 Uncommitted Reserve Capacity (ERUs) (10) - (11)	1,714
¹ Available Capacity is based on lesser of Firm Capacity or Permit to Take Water. Firm capacity is 2,819m ³ /day, PTTW is 2,817m ³ /d. Well Production is 4,780m ³ /day.	
² Max day demand is the average of the maximum day demands from 2021, 2022 and 2023 (1,004, 1,115 and 1,421m ³ /d respectively). Maximum day demands have been adjusted to account for high demands during various infrastructure works, including water tower filling in 2023 and/or watermain breaks.	
³ Serviced occupied households as reported in the 2023 Water Report.	

**TABLE 1.1
TOWNSHIP OF SOUTHGATE
2024 RESERVE CAPACITY
DUNDALK WATER TOWER ASSESSMENT**

DESCRIPTION		2023
1	Existing System Storage (m ³) ¹	5,360
2	Three-Year Max Day Demand (m ³ /d) (Table 1)	1,180
3	Storage Required (m ³) (as per MECP Guidelines)	1,539
4	Existing Surplus Storage Available (m³) (1) - (3)	3,821
5	Committed Equivalent Residential Units (Table 3)	408
6	Storage Required to Service Committed Developments (m ³)	1,727
7	Additional Storage Available (m³) (1) - (6)	3,632
¹ Total System Storage includes D3 (1,365m ³) and the Tower (3,995m ³)		

TABLE 2
TOWNSHIP OF SOUTHGATE
2024 RESERVE CAPACITY
DUNDALK SEWAGE TREATMENT FACILITY

DESCRIPTION	2023
1 Design Capacity of Sewage Treatment Facility (m ³ /d)	1,832
2 Average Day Flow ¹ (m ³ /d) (Average of 2021, 2022 and 2023 Average Day Flows)	1,149
3 Reserve Capacity (m ³ /d) (1) - (2)	683
4 Average New Development Per Capita Flow ² (m ³ /d)	0.300
5 Additional Population that can be Served (3) ÷ (4)	2,277
6 Person Per Equivalent Residential Unit (2022 DC Background Study)	2.61
7 ERU Flow Rate (m ³ /d) (4) x (6)	0.783
8 Additional ERUs that can be Served (5) ÷ (6)	872
9 Committed Development ERUs (Table 3)	408
10 Uncommitted Reserve Capacity (ERUs) (7) - (8)	464
¹ Average of the average day flows in 2021, 2022 and 2023 (1,220m ³ /day and 990m ³ /day and 1,237m ³ /day respectively).	
² As determined by new development flow analysis supported by flow monitoring program.	

**TABLE 3
TOWNSHIP OF SOUTHGATE
2024 RESERVE CAPACITY
SUMMARY OF DUNDALK DEVELOPMENTS**

COMMITTED DEVELOPMENTS	TOTAL UNITS	UNITS OCCUPIED IN 2023	REMAINING UNITS AT END OF 2023
White Rose (Phase 3) ¹	30	0	30
Flato West Block 75 Apartment Building ²	56	30	5
Flato East (7, 8 & 10)	188	68	120
Flato East (Phase 11) ²	197	0	197
Flato East (Phase 11 - Block 344)	29	0	29
Glenelg (Phase 1)	183	130	22
ANNUAL INFILL LOTS ³	5	0	5
SUB-TOTAL		228	408
TOTAL COMMITTED UNITS			408
UNCOMMITTED DEVELOPMENT	TOTAL UNITS		
White Rose (Phase 3)	47		
Flato East (Phase 9)	47		
Glenelg (Phase 2)	155		
Glenelg (Phase 3)	474		
Flato North West	416		
SUB-TOTAL	1,139		
¹ Partial allocation (30 of 77) of White Rose (Phase 3). 47 remain unallocated.			
² Apartment units based on assumption that each unit is 0.7 ERU.			
³ 5 ERUs designated annually for residential infill Lots.			

TABLE 4
TOWNSHIP OF SOUTHGATE
2024 RESERVE CAPACITY
DUNDALK EXTRANEEOUS FLOWS

MONTH	PRECIPITATION (mm) ⁴	AMBIENT TEMP. (C°) ⁴	WASTEWATER ADF (m ³ /day)	WATER ADD (m ³ /day)	EXTRANEEOUS FLOW (m ³ /day) ¹
January-2023	70.2	-3.0	1,462	819	643
February-2023	68.8	-5.0	1,477	797	680
March-2023	85.2	-1.0	1,725	787	938
April-2023	106.0	5.0	2,411	760	1,651
May-2023	39.4	12.0	1,343	769	574
June-2023	84.6	18.0	720	863	0
July-2023	134.8	21.0	858	823	35
August-2023	102.4	19.0	828	834	0
September-2023	24.6	17.0	758	1,012	0
October-2023	78.6	11.0	812	923	0
November-2023	56.5	3.0	1,029	820	209
December-2023	84.3	1.0	1,421	867	554
AVERAGE			1,237	840	440
REASONABLE ADF INCLUDING EXTRANEEOUS FLOW BASED ON POPULATION (m³/day)²					1,437
EXTRANEEOUS FLOW OVER AND ABOVE REASONABLE AMOUNT(m³/day)					-200
EQUIVALENT RESIDENTIAL UNITS USED BY EXTRANEEOUS FLOWS (ERU)³					-256

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

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

³ Based on New Development Equivalent Residential Unit Sanitary Flow Rate.

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

