



To: Mr. Glenn Clancy, P.E.

Date: December 6, 2021  
Project #: 13335.04

Memorandum

From: Curtis Quitzau, P.E.

Re: The Residences at Belmont (McLean Zone 3) Inflow and Infiltration  
Wastewater Calculation

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The purpose of this memo is to document our rationale for the wastewater generation estimate used for the attached I/I mitigation calculation. To that end, please consider the following:

1. The Town does not have nor did not legislate within the McLean District Zone 3 Overlay Bylaw a stated policy for the application of sewer infiltration and inflow fees for wastewater generation from the proposed project or from other various land uses allowed in town.
2. 310 CMR 15.00 ("Title V") tends to be the default standard of reference for wastewater generation rates throughout the Commonwealth. However, the flow rates contained within Title V are factored values to be used for the design of in-ground septic disposal systems and are not directly equivalent to wastewater generation rates. These "design flows" enumerated and explained in 310 CMR 15.203 carry a safety factor of 2.0 to account for flow variations appropriate for septic system design purposes. In other words, actual wastewater generation rates for any given use in Title V are effectively one-half of the design flow rate DEP requires be used for safe and reliable septic system design and operation.
3. For residential projects, Title V requires design flows of 110 gallons per day (GPD) per bedroom. This was based on expected wastewater generation of 55 GPD per bedroom.
4. Title V was promulgated in 1995 prior to a societal shift toward conservation and sustainability that manifested in policy changes at all levels of government and practice that led to, for examples, the Stretch Energy Code, changes in the plumbing code, and Leadership in Energy and Environmental Design (LEED). It is now common practice to incorporate (and in many municipalities mandate) use of low-flow plumbing fixtures and high efficiency appliances in new construction. These initiatives have been adopted by Belmont's Stretch Energy Building Code compliance requirements and within the McLean District Zone 3 Zoning Bylaw, which mandates a LEED Silver standard for the proposed project. It is widely understood that these adaptations in construction and lifestyle significantly reduce water use (and corresponding wastewater generation) by at least 30%.
5. Consequently, a more realistic estimate of wastewater generation per residential bedroom (for new construction in the year 2021) is on the order of 38 or 44 GPD per bedroom using 30% and 20% reduction, respectively.
6. Again, looking at Title V, DEP acknowledges that elderly housing (defined as age >55) consumes less water per 2-bedroom housing unit than an equivalent unit that is not age restricted. Rather than 110 GPD per bedroom (or 220 GPD per housing unit), Title V allows 150 GPD per unit. This means design flows of 75 GPD per bedroom, equivalent to wastewater generation of  $75 \times 0.5 = 37.5$  GPD per bedroom.

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7. The project consists of 152 housing units with a mix of 1, 2, and 3-bedrooms of which 94 of the 152 units are age restricted to 55 and older.

In light of all of the above and to simplify the math, we propose to utilize a wastewater generation rate of 40 GPD per bedroom, and 38 GPD per 1000 sf of office (50% of Title V), to account for the sales center/management/amenity space in the project. Therefore, we estimate that the project will add 11,640 GPD of new flow to the municipal sewer system as calculated on the attached I/I fee calculation spreadsheet.

McLean Zone 3									
Sewer Flow and I/I Schedule									
as of November 22, 2021									
Revised November 30, 2021									
Subdistrict A - Age-Restricted @ 55 Townhouses									
		Unit Type	units	Total Bedrooms	Rate	TGPD @ 40 GPD/BR			
New Townhouses		2 brs	15	30	40				
		3 brs	23	69					
			38	99		3960			
Chapel Reuse		1 brs	1	1					
		3 brs	1	3					
				4		160			
<i>Note all units are Age Restricted @ 55</i>									
						4120			
Subdistrict B Multifamily Apartments									
Building 100									
		1 brs	32	32					
		2 brs	19	38					
		3 brs	7	21					
			58	91		3640			
<i>Note all blding 100 units are Non-Age Restricted @ 55</i>									
Building 200									
		1 brs	15	15					
		2 brs	35	70					
		3 brs	4	12					
			54	97		3880			
<i>Note all blding 200 units are Age Restricted @ 55</i>									
Blding 100 & 200 Amenity Area(s)				Sf	38/1000	165.3			
					4350				
						I/I Rate/Unit	I/I Pmt		
<b>Total Project Sewer Flow</b>						11,640	18.2	\$ 211,848.00	