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January 2, 2025

Mr. Zachary McBride, Chair
Sherborn Zoning Board of Appeals
19 Washington Street
Sherborn, MA 01770

Ms. Daryl Beardsley, Chair
Sherborn Board of Health
19 Washington Street
Sherborn, MA 01770

RE: 34 Brush Hill Road, Sherborn, MA

Dear Mr. McBride, Ms. Beardsley and Fellow Board Members:

I have been retained by abutters and residents of Sherborn to review the above-referenced project relative to hydrologic and water quality impacts. My clients include Andrew and Michelle Lauterback and Dennis and Vicki Natale.

General Comments: I have reviewed the revised plans for four, 3-bedroom homes dated December 23, 2024 and the most recent test pit data. This design represents a 25% reduction in wastewater flow and water supply demand compared to the previous design. The revised project includes a concentrated cluster wastewater disposal system, and an untreated stormwater discharge. Limited information is provided regarding the location, depth, or pumping rates of private drinking water wells on the plans. The project site is surrounded by abutters' private septic systems, drinking water wells and wetlands. The soils are comprised of glacial till which is low permeability with shallow water table. A successful site design will depend on a careful evaluation of the site's hydrogeologic conditions.

The revised project still triggers the Sherborn Health Regulations' requirement to prepare an Environment Health Impact Report (EHIR). Section 3.1(g) of the Health Regulations require an EHIR for MGL Chapter 40B projects due to the inherent higher density of these projects within state-designated "nitrogen sensitive areas" which include areas served by private drinking water wells and onsite septic systems. The EHIR is designed to provide important hydrogeologic information that is necessary to understand groundwater flow directions, groundwater mounding, interactions between wastewater disposal and drinking water wells and to inform a successful site design.

My specific comments are as follows.

1. The proposed septic system will cause groundwater mounding which will likely compromise Title 5 compliance issues.

The Applicant has previously indicated they do not intend to provide the hydrologic analyses required by the Sherborn Health Regulations and Environmental Health Impact Report (EHIR). Therefore, I have conducted a revised preliminary groundwater mounding analysis for the new 12-bedroom septic system, using the Hantush model¹. As with the prior mounding analysis I provided to these Boards on September 30, 2024, I have utilized publicly-available hydraulic conductivity and specific yield values published for this area by the Massachusetts Hydrogeologic Atlas and the dimensions of the soil absorption system and saturated thickness provided by the Applicant (see Appendices to letter). I have utilized mirror imaging to evaluate the cumulative effects of the retaining wall/impermeable barrier shown on the plans.² The resulting analysis indicates that the groundwater mounding beneath the system will rise 4.3 feet and will inundate the wastewater soil absorption system (see Table 1 and Figure 1). This effectively reduces the vertical separation between the leaching field and the mounded water table to zero (0) and does not comply with the Title 5 requirement for a 4-foot separation.

The groundwater mounding analysis also indicates significant water table rises on the abutting parcels. A water table rise of 2.4 feet is predicted at the property boundary at 32 Brush Hill Road and 0.29 feet (3.4 inches) at the septic system on that property. According to our records that septic system was designed with a 4.0-foot vertical separation to ESHGW. The predicted groundwater mounding would reduce this to 3.7 feet and would cause the system to go out of compliance with Title 5.

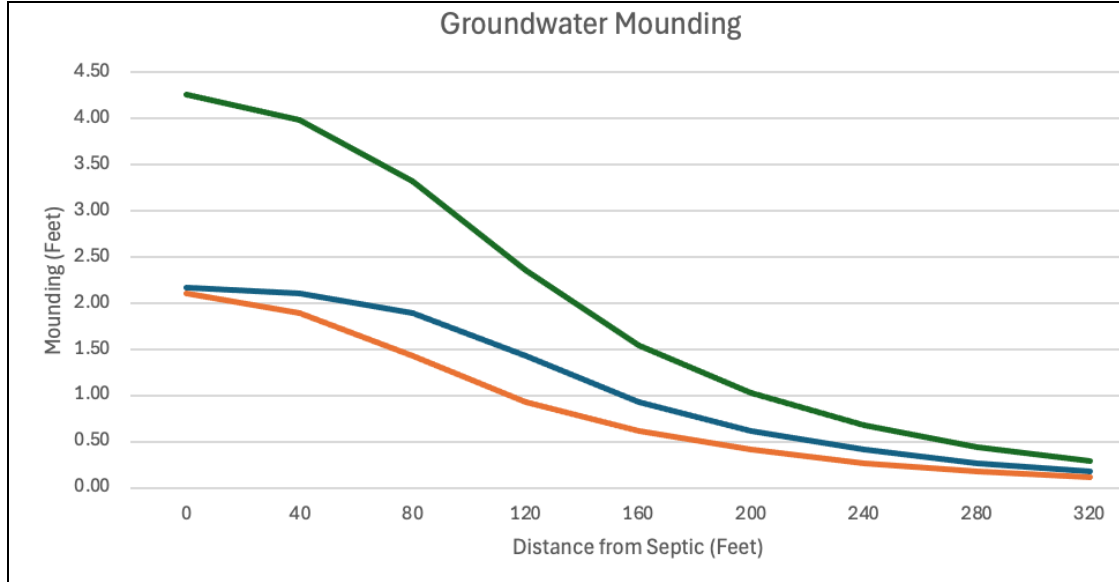
Table 1 – Groundwater Mounding Results

Location	Distance	Primary	Retaining Wall	Total
Septic Leaching	0	2.16	2.10	4.26
	40	2.10	1.89	3.99
	80	1.89	1.43	3.32
Property Boundary	120	1.43	0.93	2.36
	160	0.93	0.62	1.55
	200	0.62	0.41	1.03
	240	0.41	0.27	0.68
	280	0.27	0.18	0.45
Neighbor's Septic	320	0.18	0.11	0.29

¹ The Hantush model is recommended by MADEP in their “Guidelines for Title 5 Aggregation Of Flows and Nitrogen Loading 310 CMR 15.216”, page 10

² The revised plans do not provide sufficient detail on the design of the leaching field, and do not indicate whether the impervious liner previously proposed will still be used. My results of my mounding analysis are not dependent on this factor.

Figure 1 – Groundwater Mounding Results



Note: Blue represents direct mounding from septic, orange line represents additional mounding caused by retaining wall, and red represents total, cumulative mounding.

2. Recommendations. Based upon my review of the project I recommend that the Boards require the developer to do the following:

a) Conduct a groundwater mounding analysis to determine the effects the proposed discharge of 1320 gallons/day of wastewater and the effects of the proposed retaining wall/impermeable liner that surrounds the wastewater infiltration area.

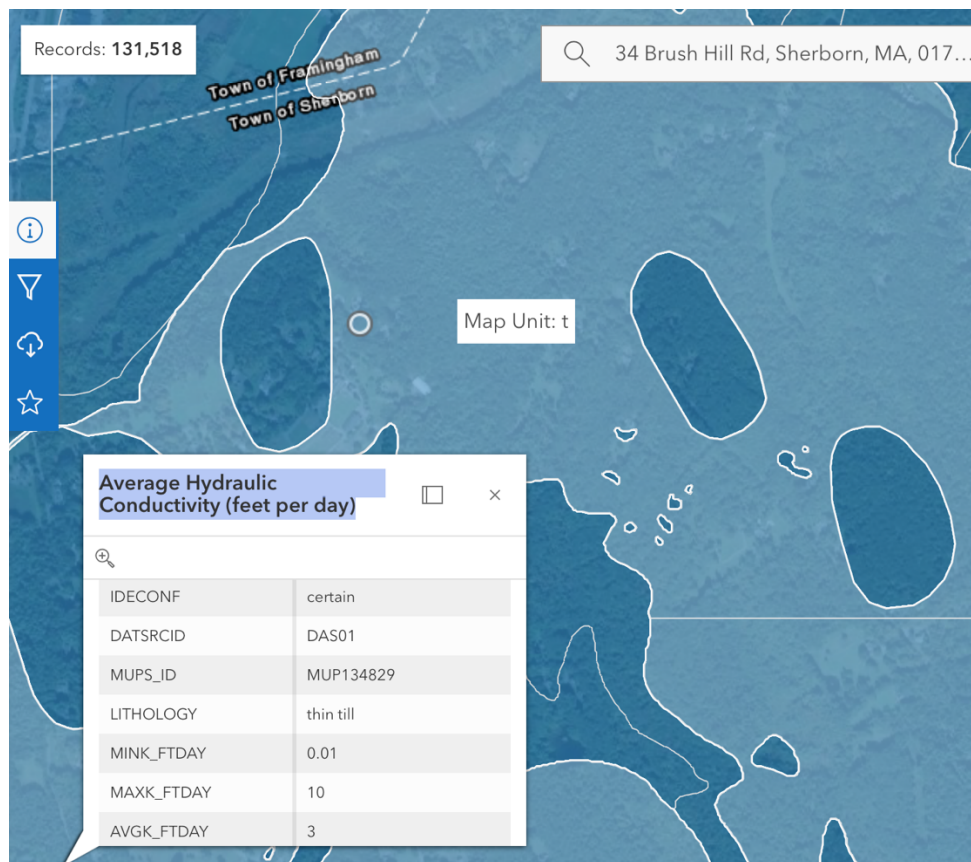
b) Identify plans for water supply well(s) and evaluate impacts on neighboring wells to determine if there would be interference between wells and a reduced capacity available to the neighbors.

c) Prepare Environmental Health Impact Report in accordance with Sherborn Health Regulations.

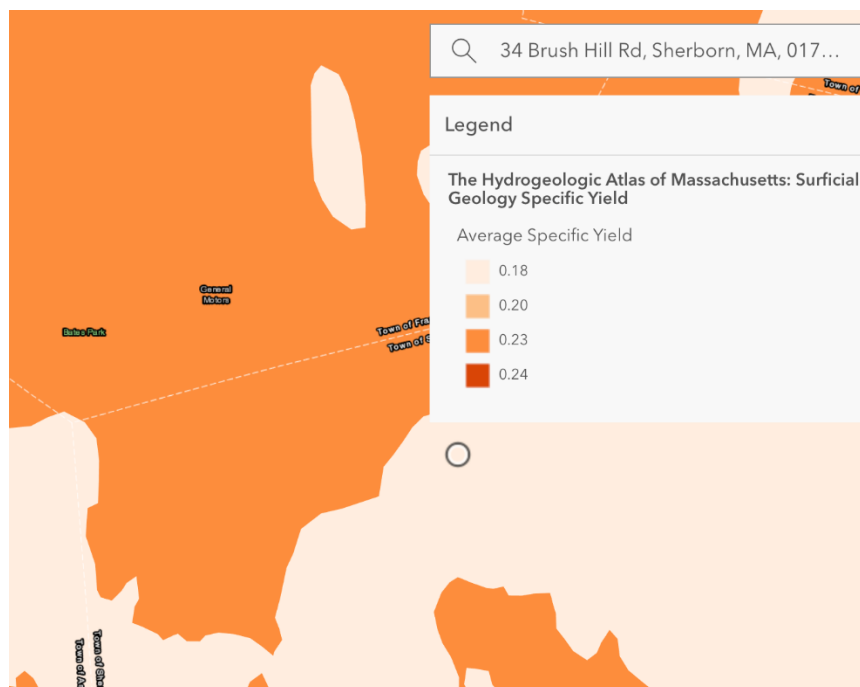
Please contact me directly with any questions that you have.

Sincerely,

Scott W. Horstey
Water Resources Consultant



Appendix A – Hydraulic conductivity (Source: Massachusetts Hydrogeologic Atlas)



Appendix B - Specific Yield (Source: Massachusetts Hydrogeologic Atlas)