Scott Horsley
Water Resources Consultant
39 Chestnut Street • Boston, MA 02108 • 508-364-7818

November 5, 2023

VIA EMAIL

Mr. Brian Moore
49 Farm Road
Sherborn, MA

Re: Farm Road 40B, Sherborn, MA

Dear Brian:

At your request I have conducted a water quality impact and nitrogen loading analysis associated with the proposed 40B development at Farm Road, Sherborn, MA. The proposed project is located adjacent to your property and is hydrologically upgradient from your property. I understand that you have a private drinking water supply well on your property.

The Sherborn Health Regulations require a detailed review of water quality impacts. Section 10.3 states that, "all distances shall be increased where required by conditions peculiar to a location or by other Town Regulations or By-Laws". The Health Regulations also require an "Environmental Health Impact Report" for all developments that exceed 2000 gallons/day.

I applied the nitrogen loading method as outlined in MADEP's "Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading 310 CMR 15.216". These guidelines stipulate that for proposed wastewater flows exceeding 2000 gallons per day adjacent to areas served by private drinking water wells that nitrate-nitrogen concentrations must be maintained below 10 mg/liter.

To determine groundwater flow directions on the subject property I plotted groundwater elevations provided by the applicant's consultant, Creative Land Development. A series of test pits shown on the site plans provide estimated seasonal high groundwater (ESHGW) elevations. Utilizing this data I constructed a water table map (highlighting the 195 foot contour) which indicates groundwater flow in a westerly direction.

Based upon these groundwater flow directions I delineated two Areas of Impact (AOI). The northerly AOI is downgradient of the proposed 40B development septic system and the southerly AOI is downgradient of septic systems on lots 1B and 2B. The locations of

the septic systems are shown on a basemap prepared by Creative Land Development dated September 28, 2023 (see figure 1).

I then calculated the resulting nitrogen concentrations at the downgradient property boundary adjacent to your parcel (see Table 1). I applied an average wastewater concentration of 35 mg/liter for Title 5 systems and a concentration of 19 mg/liter for a potential innovative and alternative (I&A) septic system at the 40B project site. This analysis indicates that the proposed wastewater discharges will result in nitrate-nitrogen concentrations in excess of the state and federal drinking water standard of 10 mg/liter for nitrate-nitrogen at the property boundary of your land.

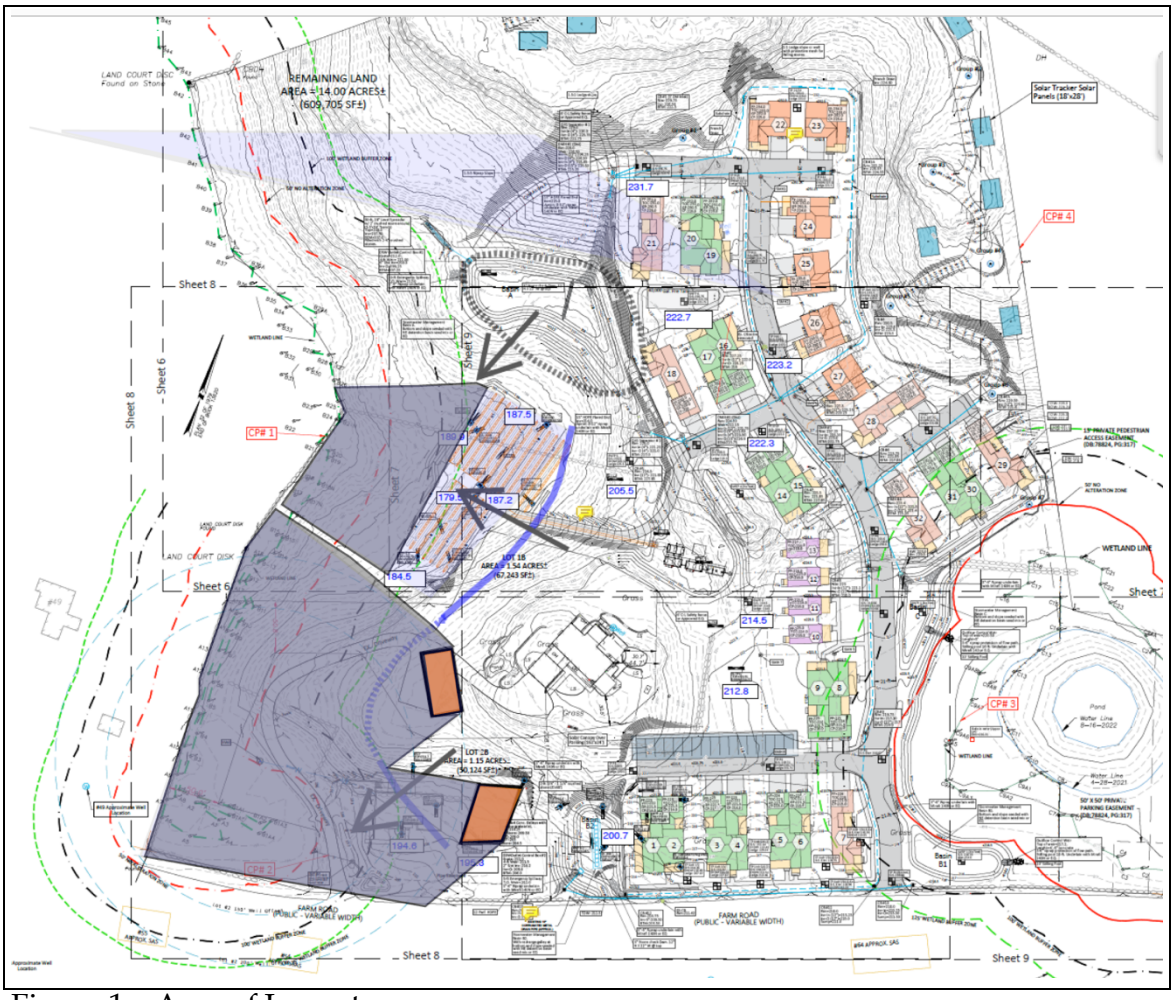


Figure 1 – Area of Impact

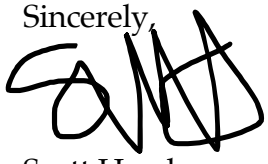
Table 1 – Summary of Nitrogen Loading Analysis

	Lot 1B/2B	40B	40B
Wastewater design flow (gals/day)	880	8360	8360
Source Concentration (mg N/liter)	35	35	19
Concentration at Property Boundary (mg N/liter)	15.8	26.9	14.6

This analysis is provided as a preliminary/conceptual assessment. A more detailed analysis of these impacts is required by the Sherborn Board of Health Regulations and should be provided by the applicant.

The map also shows an area of probable groundwater mounding associated with the large stormwater basin to the north. This will tend to redirect the wastewater plume associated with the 40B septic system further south. Similarly, the 40B septic system will also cause considerable groundwater mounding and will alter flow directions. This groundwater mounding should be incorporated into a more definitive mapping of the Areas of Impact.

Sincerely,



Scott Horsley
Water Resources Consultant