

James Engineering, Inc.  
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July 20,2020

Ms. Emily Wentworth, Senior Planner. Zoning Assistant  
Town of Hingham  
210 Central Street  
Hingham, MA 02043

Re: 302-304 Whiting Street

Ms. Wentworth;

We have reviewed the memo dated July 16,2020 from the Town of Hingham Board of Health to the Hingham Zoning Board of Appeals regarding the above noted development and offer the following response.

#### **Introduction**

I am a little disappointed to get this letter at this point in the approval process especially since this application has been in front of the town since December 2019. We have responded to both the testimony of one of the Board's members at a hearing prior to the quarantine and a previous letter from the agent. All of the issues raised in each of these presentations has been addressed either in testimony, correspondence, or plan changes by either me or the Review Engineer.

#### **Project Scope**

As correctly noted, the proposed development consists of the removal of an existing 2-bedroom dwelling and the construction of 2 3-bedroom dwellings with a common access driveway. The lot encompasses a total area of 41,287.1 square feet. It will be subdivided into 2 lots which will measure 15,731.0 square feet and 25,556.1 square feet, respectively. The common driveway will be located in an easement and will be located in the same location as the existing driveway which serves the existing dwelling. A small portion of the lot (9,270± square feet) along the southeasterly edge of the parcel is within the limits of a Zone II as identified in the Town of Hingham GIS Map. It is important to note, that prior to the development of the Derby Brook Condominium there were 2 dwellings on this lot that had utilized the existing water supply well for over 50 years. As correctly noted, on the basis of the private water supply well on the adjacent lot, this parcel is not buildable under the current Board of Health regulations. However, it must also be noted that neither of the three adjacent residential lots to the south meet those same regulations.

#### **Water Supply**

We are in the process of applying to Aquarion for a Will Serve letter. In the recent past, Aquarion has established a fund that will allow further connections to the system in exchange for funds for water saving devices on existing dwellings in town to offset the small increase associated with a residential

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house lot. I do not see any reason why these 2 dwellings would be treated any differently than the market units that have been recently connected to the system around the community.

### **State Title V Loading Standards**

As proposed, the 2 proposed subsurface sewage disposal systems meet all of the requirements of the State Title V requirements. They are located outside any Nitrogen sensitive zone as defined by the state thus, none of the issues regarding nitrogen loading limitations are applicable to the development. Since the private well on the adjacent lot is in the Zone II, the proposed leaching facilities are actually located outside of the zone and therefor down gradient of the well and cannot impact the water quality in the well.

### **Nitrogen Load Calculations**

I have reviewed the calculations. They are based upon the Cape Cod Commission Technical Paper No. 91-001 dated April 1992. There are a number of issues with the calculations that must be raised.

1. The total lawn area is substantially overestimated for each of the lots. In reality I would anticipate that only 12,000 square feet of the lot will actually be maintained as lawn. This total is actually greater than the recommendations of the technical paper which is only 5,000 square feet per lot. In addition, these owners are not going to have their grounds maintained by a landscaping service. All of the efforts to maintain the grounds will be conducted by the owners themselves. Accordingly, regular fertilizer applications will not be a routine maintenance task. Thus, the nitrogen loading from fertilizers might not apply in this analysis but will be considered as routine in the calculations.
2. The anticipated nitrogen loading rate for the roof is 0.75 mg/l not 1.5 mg/l as noted.
3. There is no nitrogen loading on the pervious surfaces except for the lawn fertilizer.
4. The nitrogen loading rate for the pavement is 1.5 mg/l.
5. The roof area is 1504 square feet.
6. The pavement area is 3,822 square feet.
7. The calculation is based solely upon maximum occupancy all of the time and the results will truly represent the absolute maximum groundwater loading possible from the 2 proposed dwellings. Realistically, I would anticipate that actual occupancy would be in the range of 6 persons.
8. I conducted my calculations for the entire parcel using the figures and corrections shown above, and the maximum nitrogen loading rate for the parcel will be 11.1 mg/l.
9. Based upon actual occupancy, the calculations show that the nitrogen loading will be 6.92 mg/l.

As noted, this technical paper is from 1992. There have been some significant improvements in water usage since the paper was published. Toilets are now down to 1.1 gallons per flush as opposed to 7.1 gallons. Washing machines and dishwashers each have reduced consumption volumes per load. Through the Testing Center on Cape Cod, Title V requirements have been revised to help reduce the potential impacts on groundwater quality. They include;

- Depth of cover over the leaching facilities have now been reduced to 3' maximum in order to maximize evapotranspiration rates and minimize impacts on the groundwater resources.
- Minimum tank size has been increased to 1500 gallons in order to lengthen contact time in the tank.

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- **Long Term Application Rates** for the design of the leaching facilities have been modified and sidewall area rates have been eliminated.

None of these factors which have evolved since the paper was published in 1992 are being considered. Accordingly, these nitrogen concentration rates should be considered as an absolute maximum. Regardless of the anticipated nitrogen loading, the effluent from these 2 systems will ultimately mix with the stream flow west and north of the site. The flow from these 2 lots will be a minute fraction of the actual stream flow and will ultimately have extraordinarily little impact on total nitrogen levels in the groundwater.

### **Private Water Supply Protection**

As previously noted, the proposed leaching facilities are each located down gradient of the existing private well at 300 Whiting Street. Accordingly, they do not have the capability to impact the water quality at the abutting well. Based upon this fact, it is my opinion that both the review engineer and I have considered the potential impacts of this proposed development on the groundwater quality and the protection of the neighbors' private water supply.

This development provides the Board of appeals the opportunity to approve *2 individual dwellings* which will help to serve the affordability needs of the community. From my experience as an engineer who normally represents the development community, this is a rare and unique opportunity for the community. I would hate to see this opportunity missed on the basis of misplaced fear over health concerns that are not applicable to the development as proposed.

Thank you for your consideration in this matter. If you have any further question or comments regarding the submission, please do not hesitate to contact me. I look forward to meeting with you to discuss the matter further.

Sincerely,

*Gary D James*

Gary D. James, P.E.

