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Miyares and Harrington LLP

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J. Raymond Miyares
Thomas J. Harrington
Christopher H. Heep
Donna M. Brewer

Jennie M. Merrill
Jonathan E. Simpson
Magdalene K. Carter
Ivria Glass Fried
Eric Reustle

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Massachusetts Department of Environmental Protection
Northeast Region
Drinking Water Program
205B Lowell Street
Wilmington, MA 01887

Re: Lifetime Green Homes 40B Comprehensive Permit Application: Water Supply Concerns

Dear Mr. Persky,

I am Town Counsel in Carlisle and I submit this letter to you on my behalf and on behalf of the Board of Health.

The intention of the Board of Health is to ensure adequate protection of groundwater resources, the provision of clean drinking water, and continuity of service for residents in a town that has no back up municipal wastewater or drinking water supply. The Board does not intend to obstruct the development of the Lifetime Green Homes project.

It appears to the Board that the only purpose in designing nine private well locations is to circumvent classification of the drinking water system for this property as a public water supply. It is the Board's position that the operation of nine private water supplies at this property creates heightened risks of water service disruption and, considering the location of the property, inadequate monitoring for drinking water contamination. Additionally, the Board does not believe that legal remedies can adequately address the problems that may arise as a result of the number of proposed residential wells and the proximity of those wells to wells and septic systems owned by abutters.

The Massachusetts Department of Environmental Protection (MassDEP) regulations related to classification of water supplies expressly state that MassDEP "reserves the right to evaluate and determine whether two or more wells located on commonly owned property, that individually serve less than 25 people, but collectively serve more than 25 people for more than 60 days of the year should not be regulated as a public water system, taking into account the risk to public health." 310 CMR 22.02.

The following comments are submitted in an effort to see that the project's water supply is classified in a manner that appropriately considers the risk to public health posed by the proposed system. The Board strongly believes that the project should be classified as a Public Water Supply regulated under 310 CMR 22.00 and that no waivers should be granted for the construction of private wells.

Protection of Drinking Water

Density - The proposed development, submitted under a 40B Comprehensive Permit Application, consists of 19 new and 1 existing single-family house at 100 Long Ridge Road, Carlisle MA. With three bedrooms per new unit and four in the existing house, the project has the potential for housing a total of 122 residents. As currently proposed, the project includes three soil absorption systems (required design flow of 6,710 gallons per day) and nine private household wells on 9.84 acres of land. The project will also require a well to supply the 30,000-gallon fire cistern and an irrigation well for a total of eleven wells, ten of which would be new wells as one well already serves the existing house.

The land area supporting the proposed wells is limited as all of the nearby and adjacent properties are also served by onsite wells and private sewage disposal systems. The project is also self-limiting in that the build out has maximized the use of all of the land area available for building and waste disposal. The project's wastewater design flows exceed the Title 5 Nitrogen Loading Limitation (440 gpd/acre) and require the approval of a Community Aggregation Plan and nitrogen credits from an adjacent lot. 310 CMR §§ 15.214 and 15.216. No such plans have been submitted for approval at this time.

Following recent natural disasters, it has been the Board of Health's experience that an interruption in water supply even for a short period poses a significant health risk to residents. Not only are residents deprived of drinking water, but interruptions also interfere with waste disposal as toilets need water to flush. Consequently, any interruption of water supply for even a small number of households poses a significant health risk to Carlisle's residents.

Because Carlisle is 100% wells and septic systems National Grid prioritizes power restoration for the community following a storm. Despite being prioritized, water systems without backup power or backup water supplies can still be disabled for substantial amounts of time following storms and other events. Private wells are not required to have backup power or water supplies. See Massachusetts Department of Environmental Protection, Private Well Guidelines. Public Water Supplies, on the other hand, are required to have an emergency supply of water available and a backup power supply pursuant to 310 CMR 22.04.

Given the density of the project, management of wastewater and protection of drinking water are the two most important considerations for the Board of Health since the Town of Carlisle has no backup town water or municipal sewerage facility.

Hydraulic Connectivity – The project wells will obtain their water from bedrock fractures. This is also true of the abutting wells. The existing soil information deals only with the overburden not the bedrock. Additional information is needed to determine whether the onsite wells are hydraulically connected. If the project wells are hydraulically connected, they should be treated as one system and classified as a Public Water Supply. The Board believes that it may be more economically feasible for the developer to install one or two community wells and possibly include the existing onsite well at 100 Long Ridge Road than to drill ten new wells.

Water quality is a concern in Carlisle. Many wells have high levels of iron and manganese that require filtration. According to Board of Health records, one-third of the properties near the project area exceed the Maximum Contaminant Level (MCL) for Iron and Manganese with a potential for needing filtration. Manganese in drinking water is getting special attention due to concerns about potential health risks especially in infants and young children. MassDEP, Manganese Monitoring Notice to Public Water Suppliers; see also References: Manganese in Drinking Water (and studies cited therein).[1] Arsenic is also a problem for Long Ridge Road, which was identified by the United States Geological Survey (USGS) and MassDEP as an area having the potential for high levels of arsenic in private water supplies based on levels of naturally occurring arsenic in the bedrock. Colman, J.A., 2011, Arsenic and Uranium in Water from Private Wells Completed in Bedrock of East-Central Massachusetts – Concentrations, Correlations with Bedrock Units, and Estimated Probability Maps[2]; MassDEP, Probability of Exceeding Arsenic Levels in Private Drinking Water Wells in Massachusetts.[3] These levels may require some type of filtration or treatment. A Public Water Supply would have a single filtration and treatment system maintained and operated by a Certified Well Operator, and testing would be required on a regular basis. 310 CMR §§22.06(6) and 22.11B. There is no assurance that private wells would be tested on a regular basis. Households may be unaware that there is a problem with the well until someone becomes ill.

Backwash Discharge - The impact of discharging filtration system backwash from nine private household wells into the ground is another groundwater pollutant to consider for the project. Title 5 prohibits the discharge of backwash from filtration

[1] Available at http://www.mass.gov/eea/agencies/massdep/water/drinking/lead-and-other-contaminants-in-drinking-water.html#9

[2] Available at http://pubs.usgs.gov/sir/2011/5013/

[3] Available at http://www.mass.gov/eea/docs/dep/water/drinking/au/potential-state-ar.pdf

systems into the septic system. 310 CMR 15.004(8). Separate drywells are required. Drywells have specific setbacks to leaching areas and should not be located close to another drinking water well. In addition to introducing chemically treated water back into the ground, the geometry of siting these drywells could be problematic.

Legal and Financial Responsibilities – If the water system is classified as a Public Water Supply, the Condominium Association will own the system providing direct responsibility for operation, maintenance and replacement. If the system is classified as nine private wells, responsibilities between the various owners may be ambiguous and decisions arbitrary. Questions may arise on collecting and holding financial reserves for repair and maintenance, who will manage the funds, and the ability to replace a failed well in another location. At Whitney Farms in Sherborn, there was one well per unit. There was a direct one to one responsibility of owner to well. This is not the proposal for Lifetime Green Homes and the shared wells concept.

Operation and Maintenance - This will be one of the most difficult issues to overcome. The present proposal is for a single well to serve two or three households, a/k/a shared well. The wells would be privately owned, operated and maintained under some type of recorded document. It is difficult to understand how any legal document can overcome all of the potential situations that might arise from a shared well. For example, a single unit will be responsible for paying for the electrical service for operating the well pump possibly causing a financial hardship. How will this be resolved? What happens if owner A wants to treat the water but owner B refuses, who decides? What happens if a repair is needed but owners do not agree on cost, contractor, or schedule? What financial remedies will be available to the Association if individual owners refuse to maintain a shared well? Some residents are very careful about their water usage while others think nothing of prolonged water use and waste.

Cost - At an average cost of $10,000 per single well installation, it is unlikely that the designation of a Public Water Supply would exceed the cost of ten new wells.

Well Testing Protocol – The Board firmly believes that an extended testing protocol of all onsite and abutting wells within 500' of the property is required. The Board would like to see a 48-hour pump test during which time abutting wells will be monitored.[4] It is important that the testing of the wells takes into account the casing storage. This is the water that sits in the well column and is available for immediate pumping. If the well is very deep this can amount to a large volume of

[4] Coventry Woods, a forty-one unit Chapter 40B development that was permitted but never constructed, was required to place transducers in abutting wells to track water levels for seven days prior, during the pump test of the new wells, and seven days post in order to evaluate impacts.

water and complicate the interpretation of well yield. The recovery rate is also important in determining well yield.

Another concern is that Long Ridge will be a phased development. If individual wells are added one at a time, it will not be possible to obtain a complete picture of possible impacts to abutters' wells.

Generators – A Public Water Supply is required to have a generator. 310 CMR 22.04. This is not true of private wells. Given the proximity of the households in the project, it is unlikely that a power loss would only affect a limited number of units. More likely, all of the 20 households will be affected during a power outage. Given the concerns discussed above, the Board strongly believes that a backup power supply is a necessity in this situation to protect public health. Neither the risk of a power outage, nor any mitigation strategy, is mentioned in the legal documents submitted.

Protective Radius – The only setbacks required for a private well in Carlisle are 25' from the property line and any setbacks provided under Title 5. See Carlisle Water Supply Regulations, Section VI: Well Location and Use Requirements; 310 CMR 15.211. As such, there would be no protective area around the proposed wells. Driveways, structures, gardens could be constructed immediately next to a well. A Public Well Supply, on the other hand, has a required protected area ("Zone I") surrounding water supply wells in which certain activities that might harm the water quality are prohibited. See 310 CMR §§22.02 and 22.21. Underground oil tanks would be prohibited in Zone I as well as application of pesticides and herbicides. See 310 CMR 22.21(3)(b). Lifetime Green Homes is proposing underground propane tanks but has not submitted a layout plan or shown proximity to wells. Gas from a leaking tank could seep into a nearby well creating a hazard if ignited.

Conclusion

A Public Water Supply would have state site approval, a 48-hour pump test, Zone I protective radius, regular monitoring, a financial reserve account and back-up power. The system would be maintained on a regular basis by a Certified Well Operator. These steps would help to ensure that there is a safe drinking water supply for the project that is located in an area that has exhibited numerous failed septic systems and poor water quality. It would also identify any potential impacts to nearby private wells.

The Board requests that DEP classify the Lifetime Green Homes project as a Public Water Supply. To do otherwise will put the future residents, neighbors and the town disproportionately at risk and jeopardizes the health and safety of the

individuals and the environment.

Sincerely,

Thomas J. Harrington, Town Counsel

Cc: Board of Health
Zoning Board of Appeals
Board of Selectmen
Conservation Commission
T. Goddard
D. Deschenes