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August 30, 2023

Mr. John Lee, Chairperson
Walpole Zoning Board of Appeals
135 School Street
Walpole, MA 02081

RE: Darwin Lane 40B

Dear Mr. Lee and Members:

I have been retained by Hill Law to review the proposed Chapter 40B development on behalf of the Darwin Lane abutters. The focus of my review is on water quality impacts associated with the proposed development due to its close proximity to the Town's water supply well and compliance with applicable state and local laws and regulations designed to protect drinking water.

Qualifications: I have over 35 years of professional experience in the field of water resources management. I have been retained as a consultant to federal, state, and local government agencies, non-governmental organizations (NGOs), and private industry throughout the United States, Central America, the Caribbean, the Pacific Islands, Bulgaria, and China. I have served as an instructor for a nationwide series of U.S. Environmental Protection Agency (USEPA) workshops on drinking water protection and watershed management. I have also served on numerous advisory boards to the USEPA, the National Academy of Public Administration, Massachusetts Department of Environmental Protection (DEP), Massachusetts Executive Office of Energy and Environmental Affairs (EEA), and the National Groundwater Association. I have received national (USEPA) and local awards for my work in the water resources management fields. I serve as Adjunct Faculty at Harvard University Extension School and Tufts University, where I teach graduate-level courses in water resources policy, wetlands management, green infrastructure, and low impact development (LID). These courses focus on the critical role of local governments who have the primary responsibility and authority of regulating land uses in critical water resource protection areas.

Comments: I have reviewed the project files and offer the following preliminary comments.

1. The project proposes to infiltrate stormwater into the town's drinking water supply protection area associated with Washington Well 5. The project is located entirely within the Zone II wellhead protection area to the Town's drinking water supply and approximately 500 feet from the drinking water well (see figures 1 and 2). This will introduce nutrients, metals, hydrocarbons, and pathogens into the drinking water supply and poses a serious risk to public health.

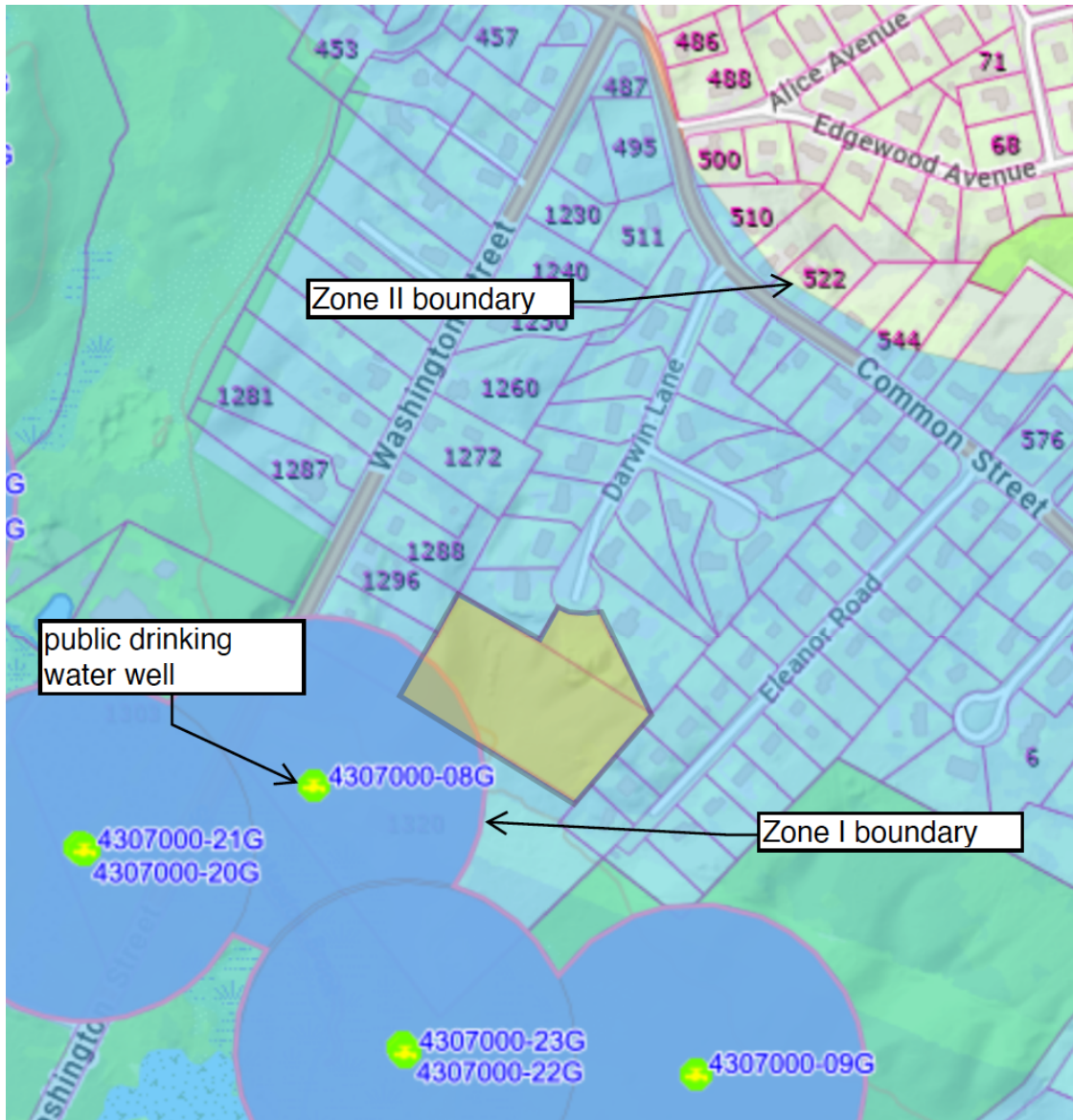


Figure 1 – Wellhead Zone I and II Protection Areas (MAGIS)

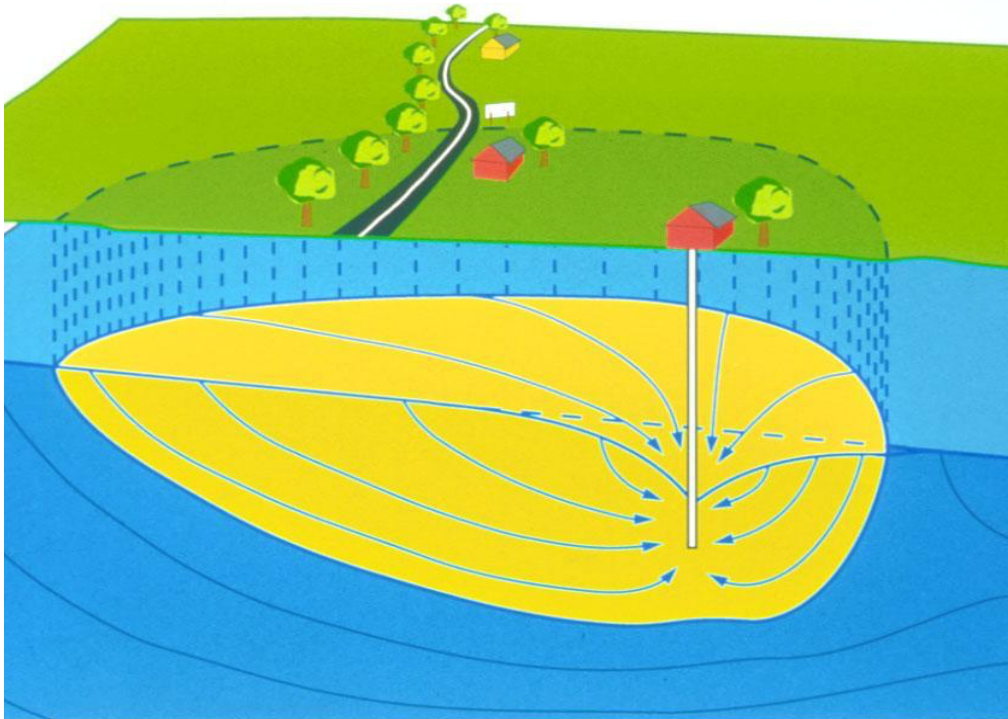


Figure 2 – Wellhead Zone II Protection Area

2. The Massachusetts Drinking Water Regulations require towns to adopt Zone II wellhead protection regulations to protect public drinking water supplies. Specifically, 310 CMR 22.21 (2)(b)(7) states, *“Wellhead protection zoning and nonzoning controls submitted to the Department (by towns) in accordance with 310 CMR 22.21(1), shall collectively prohibit the siting of the following and uses within the Zone II,.....land uses that result in the rendering impervious of more than 15% or 2500 square feet of any lot or parcel, whichever is greater, unless a system for artificial recharge of precipitation is provided that will not result in the degradation of groundwater quality”*.

3. In accordance with the state requirements, the town of Walpole promulgated local Health Regulations to protect its public drinking water supply. Within Zone II wellhead protection areas, the Walpole Health Regulations prohibit impervious coverage over 15% in order to protect groundwater quality near the wells: *“Land uses that result in impervious cover of more than 15% or 2,500 feet of any lot, whichever is greater, are prohibited; unless a system of artificial recharge of precipitation is provided that will not result in the degradation of groundwater quality”¹(emphasis added)*. The proposed development includes 45.6 percent impervious coverage, which exceeds the maximum allowed impervious area by more than three (3) times².

4. The relative risk of contamination to the drinking water supply is based upon two factors – density and distance. Higher percentages (greater than 15%) of impervious surfaces translate to greater volumes of stormwater and higher pollutant loads infiltrated into the aquifer/groundwater system.

¹ Walpole Bylaws, Section 665-4(E).

² Section 3.2.11 – List of Requested Exemptions and Waivers

Shorter distances provide less opportunity for attenuation of pollutants before they reach the well. For example, viruses are attenuated via an inactivation process related to groundwater travel time. In Massachusetts a two-year travel time is utilized to protect against virus transport. The travel time from the proposed stormwater infiltration system to the pumping wells is estimated to be less than two years.

5. The Walpole Health Regulations place the burden on the applicant to prove that their project design will not introduce pollutants into the Town's public drinking water supply and cause *degradation of groundwater quality*. No analysis has been provided regarding impacts associated with the proposed stormwater discharges.

6. The Applicant's Requested Waivers and Exemptions claims that the project will meet the MADEP Stormwater Standards but not the town of Walpole's requirements. The MADEP Stormwater Standard 6 (Critical Areas) requires that, "*proponents must comply with local source water protection ordinances, bylaws, and regulations*"³. If the proposed system does not comply with Walpole's local water protection requirement, then it also fails to comply with Standard 6 of the MADEP Stormwater Standards.

7. The Walpole Health Regulation requirement is more stringent than the MADEP Stormwater Handbook and Standards. The MADEP Stormwater Standards are designed to protect wetlands (not drinking water supplies) and treat particulates or total suspended solids (TSS). The Walpole regulation is broader because it applies outside of wetland areas – including wellhead protection areas -- and encompasses all treatment to ensure groundwater quality, not just TSS and particulates.

8. Infiltration systems (as proposed by the applicant) remove some of the particulate (solid) pollutants (TSS) but provide little or no treatment for dissolved pollutants that will pass into the underlying groundwater and drinking water supply. Dissolved pollutants that are routinely found in stormwater include deicing chemicals, nitrates, and organic compounds such as 1,3-dichlorobenzene, pyrene, fluoranthene, and PFAS⁴. Sources of these pollutants include automotive emissions, tire rubber, asphalt pavement and asphalt roofing shingles. Recent studies are showing that PFAS are present in a wide variety of construction materials including roofing materials, paints and coatings, sealants, caulks, and adhesives⁵.

These dissolved pollutants are not attenuated in infiltration systems. On Long Island, New York, toxins were detected in groundwater beneath stormwater recharge basins, including: benzene (groundwater concentrations of 2±3 ug/l); bis(2-ethylhexyl)phthalate (5±13 ug/l); chloroform (2±3 ug/l); methylene chloride (stormwater concentration of 230 ug/l and groundwater concentrations of 6±20 ug/l); toluene (groundwater concentrations of 3±5 ug/l); 1,1,1-trichloroethane (2±23 ug/l); p-chlorom-cresol (79 ug/l); 2,4-dimethyl phenol (96 ug/l); and 4-nitrophenol (58 ug/l) (Ku & Simmons, 1986)⁶.

³ MADEP Stormwater Standards, Volume 1, Chapter 1, Table CA3, Standard 6.

⁴ Trogan et al, "Groundwater Impacts from Stormwater Infiltration Practices", Encyclopedia of Water: Science, Technology, and Society, edited by Patricia A. Maurice, Copyright " 2019 JohnWiley & Sons, Inc. DOI: 10.1002/9781119300762.wsts0103 and Pitt et al, "Groundwater contamination potential from stormwater infiltration practices", Urban Water 1999.

⁵ Green Policy Institute, Building A Better World - Eliminating Unnecessary PFAS in Building Materials, 2019.

⁶ Pitt et al, "Groundwater contamination potential from stormwater infiltration practices", Urban Water 1999.

9. To meet the required performance standard of no *degradation of groundwater quality* (due to the excessive amount of impervious coverage), the applicant must demonstrate that drinking water standards are maintained beneath the site. For the “forever chemicals” that do not degrade in groundwater the drinking water quality in the public water supply well is directly dependent upon the groundwater quality beneath each parcel within the Zone II area. This includes the existing PFAS standard of 20 ng/liter or the proposed standard of 4 ng/liter.

PFAS is a “forever chemical” meaning that once it is introduced into the groundwater it will not be attenuated and will flow into the well and drinking water supply. The town of Walpole should interpret its standard consistent with the EPA standard to meet the definition of no degradation of groundwater quality. EPA has proposed lowering the drinking water standard to 4 ng/liter. On March 14, 2023, EPA announced the proposed National Primary Drinking Water Regulation (NPDWR) for six PFAS, including perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA, commonly known as GenX Chemicals), perfluorohexane sulfonic acid (PFHxS), and perfluorobutane sulfonic acid (PFBS). EPA anticipates finalizing the regulation by the end of 2023.

10. The proposed project is located within coarse glacial stratified drift deposits as mapped by the United States Geological Survey (USGS) – see figure 3. These materials are highly permeable and are vulnerable to contaminant transport.

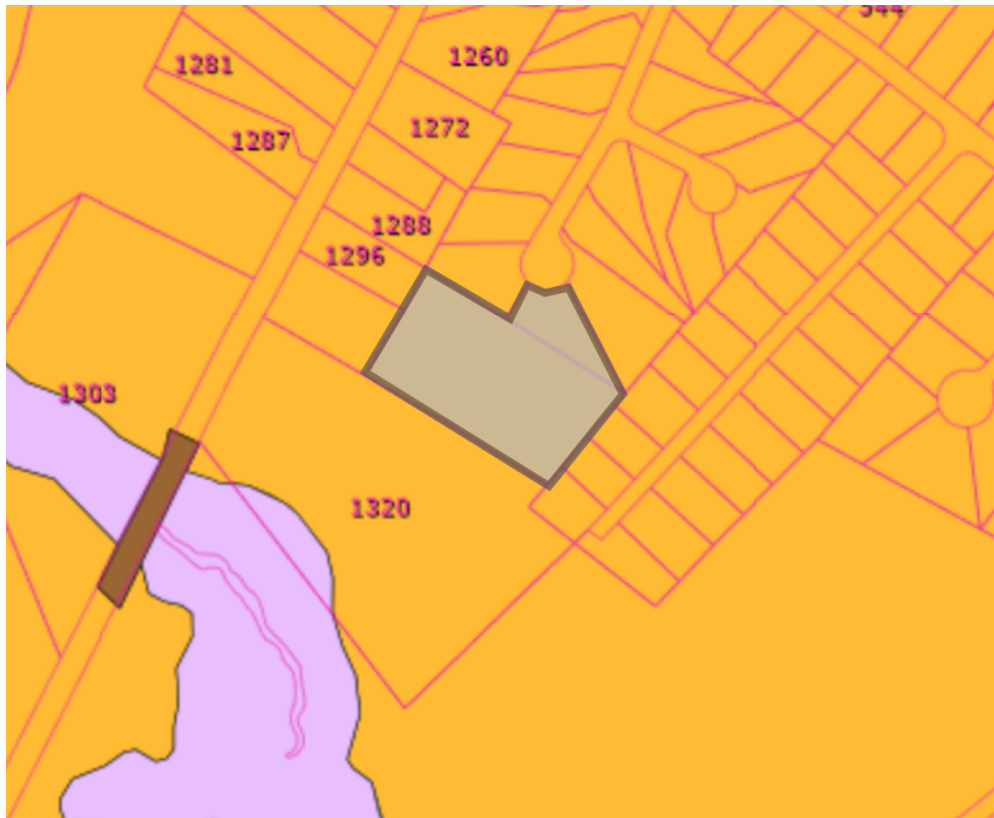


Figure 3 – Surficial Geology (USGS, MAGIS)

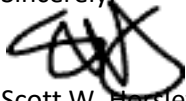
11. The Walpole Department of Health has indicated their concern with the proposed project. In their March 24, 2021 Memorandum from Melissa Ranieri, Health Director to Town Administrator, “*The Health*

Department does have concern regarding the protection of the town's groundwater since the site lies within the Zone II ...of the wellhead protection areas".

12. No test pit data is provided to determine if the stormwater infiltration system can comply with minimum vertical separation to high groundwater conditions. A groundwater mounding analysis should be provided to determine post-development groundwater elevations.

Thank you for the opportunity to submit these initial comments. I look forward to discussing them further with the Board. Please contact me directly with any questions that you might have.

Sincerely,

A handwritten signature in black ink, appearing to read 'S. Horsley', written over a faint circular stamp or watermark.

Scott W. Horsley
Water Resources Consultant