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November 4, 2024

Mr. Charles Tirone, Chairperson
Town of Arlington
Conservation Commission
730 Massachusetts Avenue
Arlington, MA 02476

RE: Thorndike Place

Dear Chairperson Tirone and Conservation Commissioners:

I have reviewed the recent reports prepared by BSC (October 4, 2024) and peer reviewer GZA (August 1, 2024) and offer the following comments. In addition to the comments that I have previously submitted I believe that the proposed project will significantly alter the site hydrology by increasing the net recharge rate which will result in higher water levels throughout the site, on abutting properties, and within the adjacent wetland. This issue was identified as "groundwater flooding" during the ZBA Comprehensive Permit review but has not been evaluated.

Increased (post-development) recharge rates will result from clearing of existing vegetation, the corresponding reduction of evapotranspiration (ET) rates and the infiltration of stormwater from impervious surfaces. The post-development, higher recharge rates will result in a higher water table. This has not been evaluated or incorporated into the site design. These elevated (post-development) groundwater levels will compromise the planned infiltration system, cause groundwater flooding on abutting properties, and will impact the adjacent wetland.

The revised plans prepared by BSC eliminate the previously proposed infiltration systems along Dorothy Road and now concentrate the stormwater infiltration into one location (INF-1). This exacerbates the groundwater mounding impacts. I have prepared an updated groundwater mounding analysis which shows that the proposed infiltration system will be inundated with groundwater and unable to function as proposed and will raise groundwater levels in the adjacent wetland.

To evaluate the impacts of this concentrated infiltration system I have prepared an updated groundwater mounding analysis to determine the cumulative impacts of smaller storms throughout a 90-day period¹. I have utilized the input data for hydraulic conductivity, specific yield and saturated thickness directly from BSC's Response to GZA Peer Review dated October 4, 2024 (Attachment E). I have applied a cumulative runoff rate of 40 inches/year (or 10 inches for the 90-day period)². This analysis shows that the proposed infiltration system will be inundated with a groundwater mound of approximately 4.6 feet and will be unable to function as proposed (see Figure 1).

¹ MADEP recommends using a 90-day duration for groundwater mounding calculations to simulate long-term steady-state conditions (MADEP Guidance Document, "Guidelines for the Design, Construction, Operation, and Maintenance of Small Wastewater Treatment Facilities with Land Disposal" June 2018 (page 21).

² Continuous Rainfall-Runoff Simulation Analysis. US EPA (Mark Voorhees) performed modeling using the Stormwater Management Model (SWMM) model for Massachusetts.

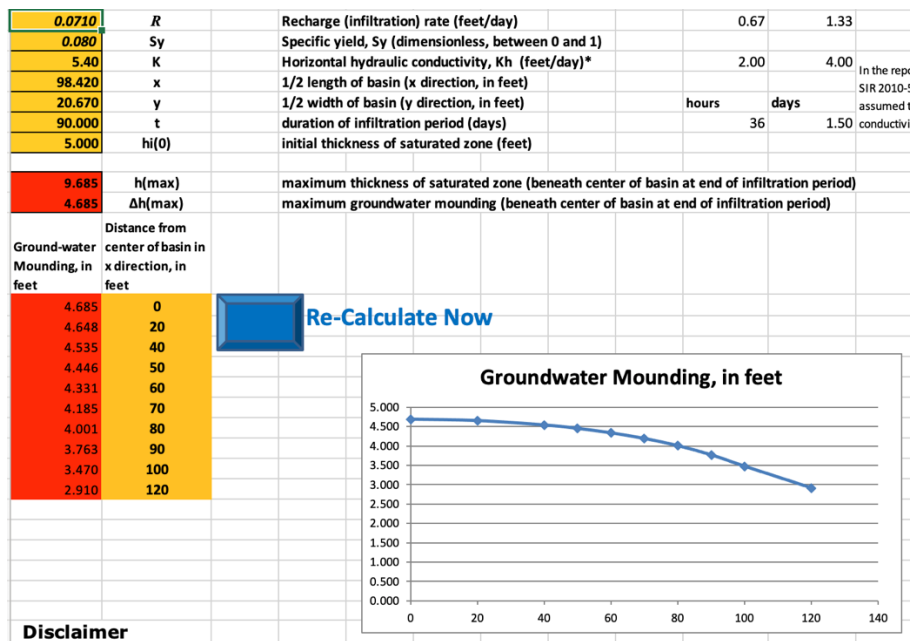


Figure 1 - Groundwater Mounding at Stormwater Infiltration System (Steady-State Conditions)

In summary, the post-development groundwater mounding associated with cumulative recharge associated with smaller storms will raise groundwater levels throughout the site. Utilizing the Hantush modeling inputs provided by BSC these conditions will cause water level increases of several feet at the wetland boundary. MADEP commonly applies a guideline of 0.1 feet as a maximum acceptable alteration in wetlands.

Thank you for the opportunity to provide these comments. Please contact me directly with any questions that you might have.

Sincerely,

Scott W. Horsley
Water Resources Consultant