

Weston Zoning Board of Appeals
11 Town House Road
Weston, MA 02493

June 29, 2022
4591.00

**Re: 518 and 540 South Avenue Comprehensive Permit
Responses to Stormwater Management Peer Review – Summary of PSC
Opinions on Required Analyses for the 25 and 100 year, 24-hour Storm Events**

Dear Chair and Board Members,

On behalf of Hanover R.S. Limited Partnership, Sanborn Head & Associates, Inc. (Sanborn Head) has prepared the following responses to comments presented by Professional Services Corporation, PC (PSC) in their ‘Stormwater Management Peer Review – Summary of PSC Opinions on Required Analyses for the 25 and 100 year, 24-hour Storm Events’ letter, dated June 27, 2022, regarding the above-referenced project.

Overview

Comment: *PSC’s January 2022 review memo and subsequent review matrix (submitted circa May 3, 2022) have requested that the Applicant provide complete revised analyses of proposed stormwater management system performance for the 25-year and 100-year, 24-hour storm events under anticipated groundwater mounding conditions that include discharges from the proposed treated wastewater disposal area. The Applicant has refused to comply. We wish to reiterate that these issues are not insignificant, and we wish to restate the reasons why the Applicant should provide the requested analyses.*

Response: Sanborn Head has reviewed the prior comments compiled by PSC within their review matrix and provided responses in conjunction with the project team, as well as, addressed similar comments provided by other peer reviewers regarding the 25-year and 100-year storm events. The design is in compliance with the Massachusetts Stormwater Handbook. Specifically, the proposed design provides for 4 feet, or more, of separation between estimated seasonal high groundwater and bottom of stormwater basin; therefore, a mounding analysis is not required for stormwater design. As we have explained before, the mounding analysis for the 10-year storm event was completed as a by-product for the design and hydrogeological evaluation of the wastewater system. No further mounding analysis is required by MassDEP.

Comment: *Essentially all Site stormwater and treated wastewater effluent are being discharged into the same Site area east of the building that has been identified by additional soil testing to be most favorable for recharge. Combining these locations of the subsurface structures takes advantage of the more permeable on-site soils and minimizes potential impacts of infiltration facilities located near the boundary of adjacent residences. However, centralizing the location of these subsurface facilities does not as nearly replicate the*

predeveloped infiltration which occurs over the entire Site. And, as noted, this area is being raised substantially in grade by retaining walls so as to provide adequate "initial condition" separation from the existing water table.

Response: We agree that both the stormwater and wastewater designs take advantage of the areas of the Site most favorable for recharge and Site grades have been designed to provide adequate separation from the existing water table; we consider this good design. We understand that the stormwater design prepared by Tetra Tech also provides the required recharge volume in accordance with the Massachusetts Stormwater Handbook.

Key Findings

Comment: *1. Results presented in the latest Groundwater Mounding Reports for the 10-year storm event indicate that a ground water mound estimated using the more conservative model inputs, results in ground water rising above the recharge base of one or more of the Subsurface Recharge Areas. Such mounded conditions will significantly reduce recharge effectiveness, and defeat the purpose of these systems to control peak flow and runoff volume (in fact, once a mounded condition reaches the base of an infiltration area, the rate of recharge is typically reduced by an order of magnitude). Given these findings, the Applicant should provide a detailed drawdown analysis for the three SRA facilities to show that these SRAs will fully drain within 72-hours (per the SWH requirement) and that separation from the residual water table will be restored.*

Response: Please see response provided by T. Ballestero, dated June 29, 2022, regarding effectiveness of the recharge system during operation, as well as, our previous response to M. Davis, dated May 18, 2022, regarding 'Issue 3'.

Comment: *2. The possibility of adverse interaction between stormwater infiltration areas in close proximity to a treatment plant effluent disposal area is noted in MA DEP "Guidelines for the Design, Construction, Operation and Maintenance of Small Wastewater Treatment Facilities with Land Disposal (P. 44) which states: "Where stormwater infiltration basins are proposed in proximity to an existing or proposed subsurface disposal system (SAS), the permittee shall provide documentation that no adverse impacts to the performance of the SAS shall result. The analysis should include assessment of stormwater infiltration of a one-year and ten-year design storm, or otherwise based on peak design flows to the basin if flow controls are incorporated into the design." This guidance is supportive of our requests in the case of the proposed project: Because the proposed infiltration systems (SRA's) are a critical part of the stormwater design to control peak flows, all design storms evaluated for control of peak flow (2-year, 10-year, 25-year and 100-year storm flows) should be evaluated; and, groundwater mounding should be factored in because of the potential for adverse impacts on both the subsurface effluent disposal areas and the subsurface stormwater infiltration areas.*

Response: We meet the guidelines provided by MassDEP related to the interaction between the proposed stormwater infiltration areas and wastewater disposal, which is an assessment up to a 10-year storm event. This interaction was considered by MassDEP during preparation our Hydrogeological Evaluation and subsequently accepted in principle during

their review of the first iteration of the proposed wastewater design on June 16, 2020. We note that the language emphasized by PSC within the MassDEP guidelines allows for a reduction of the storm event under evaluation; typical stormwater infiltration systems are not designed for infiltration volumes in excess of 10-year storm events, nor do flow controls expand capacity for larger and larger storms – they limit them.

Comment: 3. *Related to our concerns noted above, comments were offered by the hydrogeology firm McDonald Morrissey Associates, LLC (MMA) in their memo dated January 3, 2022; and we concur with the following excerpts from their memo regarding Site stormwater facilities design: [quote excluded for brevity].*

Response: We have previously addressed comments provided by MMA; please see our previous responses to M. Davis, dated May 18, 2022.

Comment: 4. *MA DEP SWH Standard 2: Peak Rate Attenuation requires the Applicant to demonstrate that post-development peak flows do not exceed the pre-development runoff rates. However, information on groundwater mounding at the proposed SRA's indicate that there will be detrimental interactions between the stormwater recharge facilities and predicted mounding. Yet, revised HydroCAD model results have not been submitted to demonstrate compliance with Standard 2 when the SRA's are under the influence of mounding during the 10-year event, when the recharge capacity will be greatly reduced, possibly, resulting in increases in peak flows and volumes released to the wetlands for not just the 10-year event which was analyzed, but also, in a more extreme way, for the 25-year and 100-year events for which analyses need to be provided.*

Response: Please see response provided by T. Ballestero, dated June 29, 2022, regarding effectiveness of the recharge system during operation, as well as, our previous response to M. Davis, dated May 18, 2022, regarding 'Issue 3'.

Comment: 5. *Related to item 4 above, mounding analyses are not provided for the 25-year and 100-year events as required by the SWH4 which states the following:*

Mounding analysis is required when the vertical separation from the bottom of an exfiltration system to seasonal high groundwater is less than four (4) feet and the recharge system is proposed to attenuate the peak discharge from a 10-year or higher 24-hour storm (e.g., 10-year, 25-year, 50-year, or 100-year 24-hour storm). In such cases, the mounding analysis must demonstrate that the Required Recharge Volume (e.g., infiltration basin storage) is fully dewatered within 72 hours (so the next storm can be stored for exfiltration). The mounding analysis must also show that the groundwater mound that forms under the recharge system will not break out above the land or water surface of a wetland (e.g., it doesn't increase the water sheet elevation in a Bordering Vegetated Wetland, Salt Marsh, or Land Under Water within the 72-hour evaluation period).

The mounding analysis provided to date, only for the 10-year storm, demonstrate that groundwater separation will be less than the required 4-feet, in fact, mounding will intrude into

proposed SRA recharge zones. The HydroCAD analyses for all extreme events (10-year, 25-year and 100-year) should be revised to account for the greatly reduced infiltration rates that will be in effect when mounding eliminates the “gravity drained” functionality of the SRA systems. And in turn, this revised HydroCAD analysis cannot be performed until groundwater mounding analyses are prepared for the 25-year and 100-year storm events to predict periods when the stormwater SRA’s will be impaired by groundwater mounding in contact with the SRA’s.

Response: As noted above, the design is in compliance with the Massachusetts Stormwater Handbook. Specifically, the proposed design provides for 4 feet, or more, of separation between estimated seasonal high groundwater and bottom of stormwater basin; therefore, a mounding analysis is not required for stormwater design. We also direct your attention again to the response provided by T. Ballestero, dated June 29, 2022, regarding effectiveness of the recharge system during operation, as well as, our previous response to M. Davis, dated May 18, 2022, regarding ‘Issue 3’.

Comment: *6. Also related to the items noted above, Town of Weston Stormwater & Erosion Control Regulations, May 23, 2019 (SECR)5 require that an applicant demonstrate that both peak flow and volume of stormwater released under post-development conditions will be less than those released during pre-development conditions. The Applicant has not demonstrated compliance with these requirements for all the required extreme storm events, which by necessity must include the mounding influence during those same events.*

Response: We understand that the stormwater design prepared by Tetra Tech provides the peak flow attenuation and required recharge volume in accordance with the Massachusetts Stormwater Handbook.

Summary

Comment: *The question of compliance with Standard 2 of the MA Stormwater Handbook was also raised by the Town’s wetland consultant Patrick Garner. Excerpts from our response to his question serves as our best summary on this topic:*

“We concur with mounding study peer reviewer (Mike Mobile, MMA) that the infiltration rate for stormwater at the base of the SRA (stormwater recharge area) will be radically reduced once rising groundwater (i.e., the mound) reaches into the stone bed of the SRAs. Yet, the HydroCAD analysis does not account for this mounding impact. Given that stormflow inputs to the SRAs will not be reduced in any way, and given the simple mass balance equation of “flow in must equal flow out”, it follows that for every cfs (cubic feet per second) reduction via SRA exfiltration, there will be a proportional increase in cfs flow passing out of SRA-3 into OCS-3 (overflow control structure, with 4-foot horizontal weir) and out to the wetlands. It is our opinion, given the mounding for the 10-year storm (presented by Applicant) and the mounding for the 25-year and 100-year storm (estimated by MMA), that peak flows and total volumes of storm flow out to the wetland will increase in proportion to the loss of exfiltration within the three SRAs, and the Applicant needs to evaluate for this condition in consultation with their mounding consultant, perhaps through an iterative process of recalculating mound heights as exfiltration rates slow.”

“Revision of the HydroCAD model, in consultation with inputs from the mounding experts, is necessary to check for compliance with MA SWH Standard 2 on pre- to post-development peak flow control; and for compliance with Weston’s Stormwater & Erosion Control Regulations, 6.A.1.v., which states: “Projects are to be designed such that the peak rates of stormwater runoff and volumes in the post development conditions are less than in the pre-development conditions....”. In short, the present HydroCAD analyses which assumes that exfiltration rates will be unreduced/unaffected by the mound, are flawed and not predictive of stormflow control given the current design.”

Response: Please see response provided by T. Ballestero, dated June 29, 2022, regarding effectiveness of the recharge system during operation, as well as, our previous response to M. Davis, dated May 18, 2022, regarding ‘Issue 3’.

It is our opinion that the continued request for stormwater mounding analysis for the 25- and 100-year storm events is beyond what is required.

Very truly yours,
SANBORN, HEAD & ASSOCIATES, INC.



Luke Norton, P.E.
Project Director

Cc: Thomas J. Denney, R.S. Hanover Limited Partnership
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