RANGER ENGINEERING GROUP, INC.
13 Branch St., Suite 101
Methuen MA 01844
Tel: 978-208-1762
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February 10, 2021

DES Water Division
ATTN: Alteration of Terrain Program
29 Hazen Drive
PO Box 95
Concord, NH 03302-0095

RE: Alteration of Terrain Permit Application
#9 Route 103 West, Warner, NH

Dear Sir or Madam,

Please find our responses to the Warner River Local Advisory Committee letter dated August 28, 2020 listed below. The numbers correspond to the comments in the letter.

Project Narrative and Design

1. The stormwater system routes water through either a sand filter of deep sump catch basin for treatment, then to the buried chamber storage system which infiltrates water in all storms; however, with the exception of the 1 year storm there will be water discharged to the wetlands.
2. Revisions are being made to comply with the NH AOT regulations as outlined in their letter dated September 14, 2020. The system is designed in accordance with the Town of Warner Site Plan regulations section XVIII.
3. In our opinion the soil testing is consistent with the Rumney Series Soil that has hydraulic conductivity rates of high or very high rates in the substratum, which is what the testing demonstrates.
4. The permeability tests were performed during the dry season in the soil layer that will eventually receive the infiltrated stormwater. The tests were done in a manner that is considered good engineering practice and prove that the soil will infiltrate water. When the water table is high, the mounding of groundwater will create an elevation head that will cause water to infiltrate into the saturated soil below.
5. If the board decides to approve the project, a condition limiting the use of pesticides and fertilizers to organic compounds would be an acceptable method of insuring that chemicals are not introduced into the groundwater. Pre development chemical testing is not proposed.
6. Hydraulic class B does mean Hydraulic Soil group B.
7. The testing of the fill layers which are on top of the naturally occurring soils was unsuccessful. The fill soils will be removed from under the proposed stormwater area and it will be replaced with a soil that will have a hydraulic conductivity rate of 10 inches per hour which will be confirmed with in place testing at a rate of 3 tests for each 2,500 square feet of area.
8. The fill soils will be removed from under the proposed stormwater area and it will be replaced with a soil that will have a hydraulic conductivity rate of 10 inches per hour which will be confirmed with in place testing at a rate of 3 tests for each 2,500 square feet of area. Testing will be done on each lift as the soil is installed and compacted.

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9. The surface sand filter will be excavated to a depth below the bottom drain. Sand fill meeting the specifications of the sand filter requirements will be installed.
10. The areas in the right of way between the site driveway and the adjacent gas station do not receive a large amount of runoff from Rt 110, only the area directly in front of the site. The swale is has a much greater capacity than is needed. The water on the east side of the site driveway will flow into the small brook, which is where it flows now.
11. The proposed driveway locations and grading has been submitted to NH DOT for approval. Easements are not needed for the driveways because they are within the NHD DOT Right of Way.
12. To comply with the salt reduction initiative guidance issued by UMH, snow will be plowed prior to the application of deicing chemicals. The snow will not contain de-icing materials
13. The raised grate alternative was discussed with NH Wildlife prior to designing the project and it was determined to be acceptable. There may be other alternatives, but they were not evaluated.
14. An analysis was not performed. The stormwater requirements are being met which will provide protection to those wetlands.
15. Stormwater will not short circuit through the overflow from the south basin.
16. Sheet CS 9001 depicts the pre-existing drainage subcatchments used in Hydrocad.
17. The slopes around the perimeter of the site are 3:1.
18. Fill slopes will have 4” to 6” of topsoil installed, hydroseed, and erosion control blanket.
19. A 3:1 slope meets the design requirements under the AOT permit requirements.
20. Water will not be drawn from the warner river during construction of the site.

Infiltration feasibility report.

1. In place testing was performed as well as laboratory testing.
2. The fill soil will have a hydraulic conductivity of 10 inches per hour as determined by testing outlined in ENV-Wq 1504.14
3. Noted
4. Site fill soils are not being used to infiltrate water. The fill soils will be removed and replaced with sand fill.
5. The GSI report includes what is required by the AOT permit process. The test pits were logged by Ranger and included in the infiltration feasibility report.
6. The Guelph Permeability tests measured the saturated hydraulic conductivity of the soil as discussed in the report from GSI.
7. We will request a signed and stamped copy.

Long Term Pollution Prevention Plan

1. The applicant will employ DES Green SnoPro certified contractors.
2. This notation will be added to the plans.
3. This notation will be added to the plans.

Construction Period Erosion and Sedimentation Control Plans

1. The plan title has been changed.
2. This notation will be added to the plans.

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If you have any questions regarding these responses, need any additional information, or would like to discuss the project, feel free to contact this engineer.

Sincerely,

Benjamin C. Osgood, Jr., PE
Sr. Engineer