



October 27, 2023  
(Updated March 15, 2024)  
(Updated May 20, 2024)

Mr. Richard S. Novak, Chair  
Sherborn Zoning Board of Appeals  
Town Hall  
19 Washington Street  
Sherborn, MA 01770

**Re: Farm Road Homes – Comprehensive Permit  
Civil Engineering Peer Review  
Sherborn, Massachusetts**

Dear Mr. Novak:

Tetra Tech (TT) has reviewed specific submittal materials for the above-referenced Project to assist the Sherborn Zoning Board of Appeals (Board) in its Comprehensive Permit review of the proposed Farm Road Homes development. The following letter provides comments generated during our review of Applicant submittals and generally focus on substantive concerns that speak to issues whose eventual resolution may substantially impact Project design or could otherwise result in potentially unsafe conditions or unanticipated impacts.

The Project includes development of 32 units of housing on approximately 14 acres of land. The site is bounded by woodland to the north and east, Farm Road to the south and residential properties to the west. Wetland resource area is located on the western portion of the site and an isolated wetland located in the southeast corner of the site. Seven (7) private wells are proposed as water supply for the Project. Sanitary sewer system is proposed to route sewer flow to a proposed pump station and septic system located on the western portion of the site adjacent to the wetland resource area. The Applicant is proposing a solar array at the northern portion of the site on an existing cleared plateau to generate energy for the Project which will also be connected to the grid to supplement.

Our review is based on materials received from the Board comprising the following pertinent documents:

- A Project Narrative (Narrative) titled “Project Description – Comprehensive Permit Application, Farm Road Homes, Portion of 55-65 Farm Road, Sherborn MA.”
- A plan set (Plans) titled "Comprehensive Permit Plan of Farm Road Homes at Farm Road, Sherborn, MA", dated July 6, 2023 with revisions through September 28, 2023, prepared by Creative Land & Water Engineering, LLC. (CLawe)
- A Stormwater Report titled “Flood Impact Analysis and Stormwater Management, Farm Road Homes, 65 Farm Road, Sherborn, MA”, dated September 28, 2023 with revisions through October 4, 2023, prepared by CLawe.
- A MA Title V Report dated July 29, 2021 with revisions through January 20, 2022, prepared by CLawe.
- A Firetruck Turning Analysis dated July 7, 2023, prepared by Vanasse & Associates Inc. (VAI)
- A Landscape Improvement Plan, dated July 17, 2023, prepared by Ryan Associates
- A Zoning Analysis summary table.
- Request for Determination of Applicability, Preliminary Approval Request DEP letter dated August 14, 2023
- Letters and reports submitted to DEP for well determination.
- Letter to MassDEP with attachments (including Sherborn Groundwater Protection Committee) from Mr. Brian and Ms. Mary Moore dated September 27, 2023.

- Letter to ZBA Additional Comments on Farm Road Homes - Restriction and Stormwater Management Plan dated October 3, 2023.

The Plans and accompanying materials were reviewed for good engineering practice, overall site plan efficiency, stormwater, utilities, wetlands and public safety as it relates to each of the subject areas. Traffic review was completed under separate cover. Our initial comments are provided below.

#### TT 3/15/24 Update

The Applicant has supplied TT with a revised submission addressing comments provided in our previous letter including the following documents:

- A Response to Comments letter dated February 20, 2024, prepared by CLAWE.
- A Letter describing plan changes since previous plan submission dated February 20, 2024, prepared by CLAWE.
- A plan set (Plans) titled "Comprehensive Permit Plan of Farm Road Homes at Farm Road, Sherborn, MA", dated July 6, 2023 with revisions through February 14, 2024, prepared by CLAWE.
- A septic plan set (Septic Plans) titled "Proposed Septic System, Farm Road Homes, 65 Farm Road, Sherborn, MA", dated November 30, 2023 with revisions through February 2, 2024, prepared by CLAWE.
- A Stormwater Report titled "Flood Impact Analysis and Stormwater Management, Farm Road Homes, 65 Farm Road, Sherborn, MA", dated September 28, 2023 with revisions through February 14, 2024, prepared by CLAWE.
- Supporting documentation dated February 20, 2024, prepared by CLAWE.
- A Letter from Sherborn Fire and Rescue Department dated January 12, 2023 (sic).
- A Hydrogeologic Report titled "Hydrogeologic Evaluations Report, Farm Road Homes, 65 Farm Road, Sherborn, MA" dated December 11, 2023, prepared by CLAWE.
- Particle size distribution reports dated January 9, 2024, prepared by Yankee Engineering & Testing, Inc. (YETI)

The revised Plans and supporting information were reviewed against our previous comment letter (October 27, 2023) and comments have been tracked accordingly. Text shown in gray represents information contained in previous correspondence while new information is shown in black text.

It should be noted that information related to the Project is regularly being transmitted which is becoming increasingly difficult to track and include in the review of the Project, particularly as it relates to the proposed septic design and analysis. This letter reflects review of the Applicant provided materials specifically noted above and we expect further review may be required as subsequent information is submitted. We have also reviewed letters and reports provided by outside parties for consideration throughout the review process.

#### TT 5/20/24 Update

The Applicant has supplied TT with a revised submission addressing comments provided in our previous letter including the following documents:

- A Response to Comments letter dated February 20, 2024 with revisions through April 17, 2024, prepared by CLAWE.
- A plan set (Plans) titled "Comprehensive Permit Plan of Farm Road Homes at Farm Road, Sherborn, MA", dated July 6, 2023 with revisions through April 17, 2024, prepared by CLAWE.
- Meeting notes and responses to the April 29, 2024 working meeting between the Town, TT and the Development Team dated May 8, 2024, prepared by CLAWE.

- A groundwater contour plan titled “Groundwater Contours, Farm Road Homes, 65 Farm Road, Sherborn, MA” dated February 26, 2024 with revisions through April 17, 2024, prepared by CLAWE.
- A soil testing location plan titled “Wetland Resource & Soil Testing Location Plan, 55 Farm Road, 55 Farm Road - Sherborn, MA” dated February 11, 2021, prepared by CLAWE.

The Plans and supporting information were reviewed against our previous comment letter (March 15, 2024) and comments have been tracked accordingly. Text shown in gray represents information contained in previous correspondence while new information is shown in black text. **Comments resolved or Conditions recommended in our previous letter have been removed from this correspondence to consolidate the document for ease of review.**

It should be noted that TT met with the Applicant and their engineer as well as representatives from the Town on April 29, 2024 to discuss outstanding concerns related to the septic design and groundwater. The Applicant has provided subsequent response as a result of that meeting which was included as part of this review.

## SITE DESIGN

The Site Plans provide a good introduction to the scope of the Project and its various components. The following specific comments are offered to identify areas where additional information is required, or changes are requested to address questions or support further review.

1. The Project roadway is approximately 750 feet in length which exceeds the maximum length allowed under local subdivision regulations (600 feet maximum). The Applicant shall coordinate with the Sherborn Fire Department to determine if the proposed roadway length poses a risk to emergency access.
  - *CLAWE 2/20/24 Response: As a 40B project, the common access driveway is not a subdivision roadway under the purview of subdivision regulations. We do agree with the reviewer that the safety of the access driveway should be considered relating to road width, length, and turning radius. The plans have been reviewed by the FD and this plan reflects their input on the roadway layout. See Chief Ward letter dated January 12, 2024. If any new comments or recommendations from Fire Department received, we will incorporate them into the plan updating (sic).*
    - TT 3/15/24 Update: Tetra Tech has reviewed the letter from the Sherborn Fire & Rescue Department (SFRD) which requests a strictly enforced no parking zone on all streets in the development. We recommend the Applicant provide no parking signs on the Plans along the driveways to inform residents of the parking restriction.
    - *CLAWE 4/17/24 Response: “No Parking” sign is added to the trucking loading area as recommended.*
      - TT 5/20/24 Update: **Additional signage is recommended along the driveways to notify residents of the prohibition of parking along these areas.**
3. The proposed fire tank/cistern is located at the rear of the site but no method for Fire Department hydrant access is available at any other areas across the site. Typically, a dry hydrant system would be proposed throughout the development in this situation. The Applicant should provide written confirmation from the Sherborn Fire Department that this condition is acceptable. The proposed development is dense and confirming methods of fire suppression are critical to public safety.
  - *CLAWE 2/20/24 Response: At the request of the Sherborn Fire Department, Farm Road Homes has moved the fire cistern location further south on the property. The plan is updated to reflect this change and details of the dry hydrant.*
    - TT 3/15/24 Update: The cistern location has been relocated in the most recent version of the Plans which is dated before the changes were implemented. We recommend the Applicant provide updated correspondence from the SFRD related to the cistern location.
    - *CLAWE 4/17/24 Response: The applicant will request an updated correspondence from the SFD.*
      - TT 5/20/24 Update: **We will review the correspondence once provided.**

4. The location of the fire cistern would require a pump truck to block the roadway in the event of a fire emergency at the site. We recommend the Applicant consider proposing a parking space for Fire Department use with dimensions suitable to accommodate the department's pump truck.
  - *CLAWE 2/20/24 Response: The location of the fire tank has been modified since the last plan revision. The fire tank is now located in the front of the development between the road and the pond. We have widened the road in this area to allow the fire truck to park and pump water without blocking the traffic. The parking area for the truck is approximately 10-ft wide by 45-long.*
  - TT 3/15/24 Update: The cistern location has been relocated and pavement area has been widened in the most recent version of the Plans. However, there is a drain culvert proposed parallel to the tank which appears to have minimal cover. The Plan does not include information related to proposed pipe material to confirm if it has necessary cover to withstand loading from the SFRD apparatus if it does park outside of the pavement limits and over the pipe. We recommend the Applicant clarify the recommended pipe details on the plan and ensure the pipe has necessary cover.
  - *CLAWE 4/17/24 Response: The pipe material and cover is added to the plan. The pipe will be a 12" HDPE pipe with at least 12" of soil cover. We have slightly modified the grade in this area to allow for 12" of soil cover and added a headwall at the end of culvert to accommodate the new grading.*
  - TT 5/20/24 Update: **In our opinion, this comment is resolved.**
6. A 1:1 slope is proposed upgradient of the northwest corner of the parking area at Units 1 through 7. It is unclear if this slope is contained on the subject property as it appears two iron rods were located in this area but the property line with #55 Farm Road does not appear to meet at those points. The Applicant shall clarify, through their licensed surveyor if the property limits provided are correct. Additionally, 1:1 slopes are prone to erosion and stormwater will be directed through this area.
  - *CLAWE 2/20/24 Response: The slope described is contained on the subject property. The iron rods noted are from previous boundaries and are no longer relevant. A shallow runoff interception swale is added to the plan to direct runoff away from the riprapped slope. This will apply for all similar areas. We also regraded the area close to Unit 1 to make the slope to 1.5:1.*
  - TT 3/15/24 Update: We recommend the Applicant specify on the Plans that the proposed slope is to be rip-rapped consistent with other areas on site. All areas of rip-rap slope stabilization should be called out on the Plans.
  - *CLAWE 4/17/24 Response: All areas to be rip-rapped have been labeled on the plan for easier identification. We also added a note on all sheet with grading work that all rip-rapped slopes shall be underlain with Mirafi 140N or E.Q.*
  - TT 5/20/24 Update: **In our opinion, this comment is resolved.**
7. The Applicant should detail utility corridors for the proposed solar arrays and the wells. We anticipate utilities will be installed in the proposed access road along the east side of the Project and the installation may be complex with the number of wells and solar arrays proposed. The Applicant should also confirm if the utility company will require utility poles (load breaks, metering, recloser, etc.) at the interconnection point. Additionally, the wattage of the proposed system should be provided to determine if a waiver is needed from local bylaw which regulates ground-mounted solar facilities.
  - *CLAWE 2/20/24 Response: All solar arrays have been removed from the plan.*
  - TT 3/15/24 Update: The Applicant has removed the solar arrays from the Project scope and provided water connections to each of the units from the proposed well locations. There are many sewer/water crossings proposed, the pipe crossing detail does not provide any protection against cross contamination other than crushed stone. We recommend additional protection at each crossing such as ductile iron sleeves of the water service and/or concrete encasement.
  - *CLAWE 4/17/24 Response: Water pipes crossing with sewer detail on the construction detail sheet is updated with a ductile iron sleeve or equal protection.*
  - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

9. We recommend a fence with gate be proposed at the well/solar array access road to prevent unauthorized access. This is suggested for the protection of the residents from access to potential high voltage equipment associated with the array and protection of the wells from potential vehicular damage.
  - *CLAWE 2/20/24 Response: A lockable gate is provided at the entrance of the access road to the wells on the northern hill. All solar arrays have been removed from the project plan.*
  - TT 3/15/24 Update: A gate has been proposed at the access road to the wells. We recommend the Applicant coordinate with the SFRD to confirm if they require a Knox box or equal at the gate for emergency access.
  - *CLAWE 4/17/24 Response: This will be reviewed and resolved with SFD.*
  - TT 5/20/24 Update: **We recommend final written correspondence be provided from SFRD.**
12. A roadway profile and roadway cross-section should be included in the Plans.
  - *CLAWE 2/20/24 Response: A roadway cross section is provided in the detail sheet. A profile is added to the plan.*
  - TT 3/15/24 Update: Plan and profiles have been added to the Plans. We recommend water infrastructure be shown where applicable to ensure proper buried depth below frost is proposed.
  - *CLAWE 4/17/24 Response: The fire cistern will be type "D5" fiberglass tank. It will be 10 ft diameter and buried with 36" soil on top and 13 ft to bottom as required by the manufactory specifics.*
  - TT 5/20/24 Update: **Water piping should be provided on the Profile sheets to ensure proper buried depth of the infrastructure below frost.**
17. Plans are provided in color presumably for presentation purposes. We recommend all plans be provided in grayscale.
  - *CLAWE 2/20/24 Response: The color versions of the plans are provided for now for easy review and presentation. Grayscale plan will be provided for the final approval and record.*
  - TT 3/15/24 Update: We recommend the final grayscale plan be reviewed to ensure existing and proposed information is properly shown.
  - *CLAWE 4/17/24 Response: We agree.*
  - TT 5/20/24 Update: **We will review the final plans once provided.**

## **STORMWATER**

The Project scope includes development of 32 units of housing clustered on approximately 14 acres of land. Stormwater runoff generated by the Project is proposed to discharge to traditional piped infrastructure and vegetated swales to direct runoff to four proposed infiltration basins. The Stormwater scope was reviewed against the Massachusetts Department of Environmental Protection (MA DEP) Stormwater Management Standards (Standards) and Stormwater Handbook (Handbook). The Project was also reviewed for general stormwater design elements and good engineering practice.

It is our concern that the information required to make reasonable conclusions on the viability of the proposed stormwater infrastructure is lacking and additional information is required to ensure the Project is feasible given the current development program. Furthermore, the density of the Project and site conditions/constraints provide minimal latitude for any deviations in the stormwater scope related to unforeseen site conditions.

The following comments are offered specific to the Project Stormwater design.

19. The Applicant shall provide the HECHMS model printout for review to ensure proper accounting of runoff. (Standard 2)
  - *CLAWE 2/20/24 Response: The output report is provided in electronic files due to the size for print out.*
  - TT 3/15/24 Update: The sub-catchment areas noted in the output files are in square miles with many areas showing as "0" due to the size of each sub-catchment and the units of the model. We

recommend the units be set to square feet or acres to confirm pre- and post-development areas. Additionally, the final Stormwater Report shall include a pdf of the output for the record.

- **CLAWE 4/17/24 Response:** *The unit was due to the software requirements. However, they were originally mapped in square feet and covered to with the same scientific accuracy requirements. We will check out and make sure we have enough decimal points if the result is not actually 0.*
  - TT 5/20/24 Update: **We will review the information once provided.**

20. It appears off-site areas from the north and from Farm Road may flow into the Project area. Off-site areas should be included in the analysis, particularly since that flow will be directed to proposed stormwater best management practices (BMP's). Additional detail shall also be provided for the existing 10" corrugated metal culvert (presumably from Farm Road drainage) that discharges onto the property. This is required to ensure proper accounting of runoff in the analysis. (Standard 2)

- **CLAWE 2/20/24 Response:** *We checked the area to the north of the project site, there is about 9,161 SF area draining south to the property line. However, there is a mounded stone wall along the property line to divert the water to the further downgradient area that will not impact the drainage design on the project site. Therefore, we did not include the area in the analysis. For the same reason, the proposed grading of Farm Road as well as the proposed conditions will not have Farm Road runoff going into the onsite stormwater Bains. The 10" corrugated metal culvert will bypass our stormwater system to the downgradient and will not impact the design, or vice versa. See plan for details.*
  - TT 3/15/24 Update: We agree with the Applicant's representation related to off-site tributary area to the site from the north. However, the Applicant noted that the cross-culvert at the driveway for the existing homes at 53 and 55 Farm Road is one of the control points for the analysis (CP #2). As such, any flow tributary to that culvert should also be included in the analysis to ensure it is sized accordingly to pass tributary flow. An existing conditions watershed plan should also be included in the analysis for reference.
  - **CLAWE 4/17/24 Response:** *The flow to the culvert under the driveway of 53 Farm Road is total flow and it is far less than the 24" capacity. The culvert capacity analysis sheet is provided below for easy reference.*
    - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

21. The Applicant shall clarify if Lot 2B is included in this Application and whether the Applicant controls or has a written agreement with that owner to discharge stormwater runoff from the Project to that Property. Additionally, we recommend the analysis point for stormwater discharge from the Project site be the east property line of Lot 2B rather than the proposed culvert located on the west side of Lot 2B. This will ensure runoff is analyzed and mitigated prior to discharge to that lot. (Standard 2)

- **CLAWE 2/20/24 Response:** *The culvert at the driveway was chosen as the control point as it is the most concerning point for flow restriction. There is a drainage easement on Lot 2B along Farm Road for the project to pass flow through. Given the flow are most go through the stormwater basin then to the easement, it is our best professional opinion that we should keep the control point at the culvert. As far as the concern to the property line with Lot 2B, the proposed Basin B2 will significantly reduce the drainage area to the property line, from 50,195 Sf to 12,817 SF, about 75% reduction. And the water from the rest will be directed to the Basin and overflow to the dedicated drainage easement at a reduced rate and volume. As the total flow to the culvert is reduced, and the area between the basin B2 and the culvert is existing off-site area, the flow is expected to remain the same, so the flow to the property line after the control would be reduced and there is no need to do a separate analysis.*
  - TT 3/15/24 Update: See Update at Comment 20.
  - **CLAWE 4/17/24 Response:** *See response to Comment 20.*
    - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

22. Many test pits shown on the Plans were not provided in Table D.1 in the Stormwater Report nor were logs provided in the Stormwater Report to confirm soil horizon information. The Applicant is proposing four infiltration basins dispersed throughout the site to mitigate stormwater runoff generated from the development as well as provide groundwater recharge and water quality treatment. All Infiltration BMP's shall include at least one test pit, performed by a Massachusetts certified soil evaluator, required to determine soil type, soil profile and depth to estimated seasonal high groundwater (ESHGW), all information should be provided using test pit logs. Infiltration Basins A, B1 and C are proposed in areas mapped as HSG C and D soils which is not recommended. (Standard 3)

- *CLAWE 2/20/24 Response: In each of the infiltration areas, soil testing was performed to confirm the soil texture that is suitable for infiltration. Soil logs for the test pits for the current project scope have been provided as part of the plan set. See sheets 15 and 16.*
  - TT 3/15/24 Update: The Applicant has provided test pit logs for test pits conducted at each of the basins. It should be noted that the bottom of Basins A (55-9N), B1 (SWTP1) and B2 (65-10C) are all within two feet of ESHGW (as compared to their respective test pits) which is not allowed per MA DEP Stormwater Handbook. All basins, including forebays (if proposed to infiltrate and included in the basin volume) shall be designed with minimum two feet separation from ESHGW.
  - *CLAWE 4/17/24 Response: Sediment forebays are modified for Basins A and B1 to have groundwater separation of minimum 2-ft. B2 is located downgradient of 65-10C and meets 2-ft groundwater separation (65-10D).*
    - TT 5/20/24 Update: The Applicant provided additional clarification of the test pits during a call on May 8, 2024 noting that the pits in the vicinity of Basin B2 were dry during the test and no indications of groundwater were noted. The ESHGW noted on the pit labels was bottom of excavation and therefore we do not anticipate issues with groundwater intercept at this location. **In our opinion, this comment is resolved.**

25. The Applicant shall provide the calculation method and calculation sheets for the determination of hydraulic conductivity used in groundwater mounding. Identify and include the test well used to determine the saturated thickness of the overburden. Field test methods for hydraulic conductivity shall be measured by the methods noted in the Handbook. Title V percolation tests shall not be used to test for saturated hydraulic conductivity in stormwater design. (Standard 3)

- *CLAWE 2/20/24 Response: The information for reference wells of saturated hydraulic thickness and the information and references leading to the determination of hydraulic conductivities are provided in Appendix D for groundwater mounding analysis, which is updated or the stormwater management report.*
  - TT 3/15/24 Update: The MA DEP Stormwater Handbook is explicit in which methods are acceptable for determining saturated hydraulic conductivity. The acceptable methods are included in Volume 3, Chapter 1, Page 11 & 12 of the Handbook. If Rawl's rates are intended to be used for determining static recharge, then infiltration rates shall match those provided in the Handbook in Volume 3, Chapter 1, Page 22. We recommend the Applicant confirm which of the accepted methods was used to ensure the analysis meets the requirements of the Handbook.
  - *CLAWE 4/17/24 Response: The Rawl's value was used to calculate the infiltration rate for recharge and hydrogeosieve XL calculated hydraulic conductivity is used for updating mounding analysis. See attached report for details. All stormwater basins will be dewatered in three days.*
    - TT 5/20/24 Update: Use of Rawl's rates is an acceptable practice for estimating recharge for stormwater BMP's per MA DEP Handbook. **In our opinion, this comment is resolved.**

26. Stormwater basin elevation along with groundwater mounding should be added to (or in separate cross-sections) the cross-sections identified in Section E to demonstrate there is no breakout or interference with the groundwater mound from the septic systems. (Standard 3)

- *CLAWE 2/20/24 Response: The detailed groundwater mounding profile is provided in Stormwater report Appendix G for each basin. We do not see any breakout risk for any of the basins. Given basins have outflow control structure to drain for large storm event. The normal less than 2-year storm will have very minimum groundwater mounding impact, which counts for 96% of rain events.*
  - TT 3/15/24 Update: See Update at Comment 25 related to hydraulic conductivity at each basin.
    - *CLAWE 4/17/24 Response: See updated response to Comment 25.*
    - TT 5/20/24 Update: **See Update at Comment 25.**

27. Appendix D of the Stormwater Report notes that an unsaturated zone is not required under an infiltration BMP. This conflicts with the MA DEP Handbook which requires a minimum two-foot separation to estimated seasonal high groundwater (ESHGW) for Infiltration BMP's. (Standard 3)

- *CLAWE 2/20/24 Response: All basin have more than 2 ft of groundwater separations. The language is a statement of fact that infiltration can happen without separation.*
  - TT 3/15/24 Update: Proposed basins do not have the required separation from groundwater. See Update at Comment 22.
    - *CLAWE 4/17/24 Response: See updated response to Comment 22.*
    - TT 5/20/24 Update: **See Update at Comment 22.**

28. The Total Suspended Solids (TSS) removal worksheet for Basin A notes a water quality swale located between the proposed catch basin and the oil/grit separator. Piping is proposed between those two structures and the water quality swale should be removed from the calculation. (Standard 4)

- *CLAWE 2/20/24 Response: The TSS removal calculation sheet for Basin A is updated.*
  - TT 3/15/24 Update: Each basin treatment train (deep sump/hooded CB, WQ Unit, Forebay, Infiltration Basin) will provide the required 80% TSS removal. However, we recommend proposed in-line leaching catch basins (contained within the proposed roadside swales) also contain hoods to prevent downstream transport of debris.
    - *CLAWE 4/17/24 Response: We added a note and detail to all inline catch basins for T hood at the outlet.*
    - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

29. The Applicant notes that 80% TSS removal is achieved at Basin B1 and B2, infiltration basins achieve 80% TSS removal only when proper pre-treatment is provided ahead of the basin. Runoff enters through a rip-rap apron then directly discharges to the basin without a forebay or any other pre-treatment BMP. The TSS removal worksheet notes presence of a grassed channel which is non-existent in the treatment train to the "B" basins. Basin C should have its own TSS removal worksheet as the treatment train design for that basin does not match the "B" basins. (Standard 4)

- *CLAWE 2/20/24 Response: The entire project is set on a county side style road and driveway. There will be no conventional gutter channel flow. There will be 12" wide and 12" deep 3" stone apron along both sides of the road then sheet flow to grass strip or swale leading to catch Bains or to basin directly. Therefore, the treatment train for Basins B1, B2 and C will be grass swale, or combination of grass swale and catch basin pre-treatment. We use grass swale only to be conservative for three of them. We also added sediment forebays to all infiltration basins for better pre-treatment so it is in compliance with the "standard 4".*
  - TT 3/15/24 Update: See Update at Comment 28.
    - *CLAWE 4/17/24 Response: See updated response at Comment 28.*
    - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

40. The Applicant is proposing use of water quality swales to assist in treatment of runoff for total suspended solids (TSS). However, the swales shown on the Plans do not appear to meet the design requirements noted in the Handbook. Specifically, water quality swales must have pretreatment in the form of sediment forebays or pea stone diaphragm/vegetated filter strip. Additionally, the swales must have a hydraulic residence time of at least 9 minutes to achieve proper treatment of the water quality volume. (Vol. 2, Ch. 2, Pg. 77)

- *CLAWE 2/20/24 Response: The swale consists of grassed open top and a slightly elevated basin inlet with deep sump for further pretreatment. Therefore, there is adequate pretreatment before the water will enter subsurface trench area. The site has countryside style common driveways with 3" stone apron edge. There will be no untreated runoff going to the swale subsurface crushed portion. If there is any real concern, we can eliminate the subsurface stone trench and perforated pipe, which will still allow us to claim the 50% TSS removal rate benefit for grass swale. It is inadvisable to do that in our professional opinion.*
  - TT 3/15/24 Update: See Update at Comment 28.
  - *CLAWE 4/17/24 Response: See updated response to Comment 28.*
    - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

41. Basin A is located upgradient of an approximate 30% slope. Infiltration basins shall not be located within 50 feet of a slope greater than 15%. (Vol. 2, Ch. 2, Pg. 88)

- *CLAWE 2/20/24 Response: Basin A has been reshaped and relocated and the inside bottom (208) of the basin is now located approximately 51 feet from a 3:1 slope to the same elevation, which meets the 50 ft setback requirement in DEP current measurement practice.*
  - TT 3/15/24 Update: The Applicant maintains an infiltration BMP within 50 feet of a minimum 15% slope. This topic was discussed in length during our meeting with the Applicant and their engineer at town hall on January 9, 2024 and it was agreed that the basin would be converted to detention to limit possibility of the groundwater impact to the slope. We recommend the Applicant revise the design to meet the setback requirements of the Stormwater Handbook.
  - *CLAWE 4/17/24 Response: As the updated plan shows, we did provide minimum 51 ft setback from the 15% slope downgradient. As we understand, the setback is measured from the inside toe of slope to the same elevation break at the outer slope, which is the way used by DEP for measuring setback from infiltration basin to wetlands.*
    - TT 5/17/24 Update: We agree with the Applicant's and MA DEP's location for measurement in the basin. **In our opinion, this comment is resolved.**

## SEPTIC SYSTEM

The Plans indicate the Project will be served by a centralized Septic System with upstream pump station and sanitary sewer infrastructure to collect sewerage generated from the Project. The following comments are offered specific to Project septic design and related analysis or lack thereof.

58. The Project is subject to nitrogen aggregation/loading under the Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading 310 CMR 15.216. The septic system design flow is greater than 2,000 gallons per day and "(2) areas of residential new construction, as defined in Title 5, where both on-site systems and on-site drinking water supply wells are proposed (310 CMR 15.214(2)). These areas are the so-called private well areas." Based on this, the Applicant should perform the hydrogeologic assessment required to determine nitrogen loading and then calculate the nitrogen load and propose treatment if warranted.

- *CLAWE 2/20/24 Response: A hydrogeological evaluation report is provided to address the issue. Both general nitrogen loading per 310 CMR 15.216 and a detailed nitrogen budget analysis according to DEP Policy BRP/DWM/Pep-P99-7 are provided to confirm that the proposed SAS will comply with all required DEP standards.*
  - TT 3/15/24 Update: The following comments are related to the nitrogen loading calculations required in the *Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading 310 CMR 15.216 (2016)* (DEP Method). The Applicant shall re-evaluate the analysis as noted below.

- a) Soil particle size is a regularly accepted method to determine hydraulic conductivity for DEP Groundwater Discharge Permits and other projects requiring groundwater mounding analysis. However, the analysis needs to meet applicable conditions. The Hazen formula does not always meet these applicable conditions. The publicly available spreadsheet HydroGeoSieveXL has a number of formulas that identify the applicable conditions for each formula in the spreadsheet for a specific particle distribution curve. Therefore, hydraulic conductivity shall be re-evaluated to ensure it meets applicable requirements.
- b) The saturated thickness used in the mounding calculation does not match the available data and should be re-evaluated. Additional bedrock well data is available through the MassDEP Well Viewer and should be evaluated in conjunction with well location topographic data at those locations. This could be supplemented with boring(s) to bedrock in the area of the proposed location of the system. (As discussed below, the same could be completed for the stormwater systems). The Applicant shall re-evaluate saturated thickness based on available data.
- c) The Hantush analytical groundwater mounding model identified in the DEP Method is applicable for subsurface conditions and should be revised with new hydraulic conductivity and saturated thickness, with the limited amount of data it will produce a similar mound to MODFLOW without the groundwater gradient component. DEP does not allow for a constant head boundary when using this model to identify potential breakout to wetlands. DEP would typically not allow a rise at the wetland boundary above 0.1 feet for a groundwater discharge permit. However, in this case, as the discharge is under 10,000 gpd this would be determined by the Sherborn BOH. The Applicant shall revise the groundwater mounding model based on re-evaluated hydraulic conductivity not above.
- d) Once the groundwater mound has been recalculated per the DEP Model, the mound would need to be fit into the groundwater flow map to determine groundwater divides for calculation of the AOI for the nitrogen loading model, in accordance with the DEP model parameters.
- e) Based on stormwater guidelines and on the depth to ESHGW beneath the proposed stormwater basins, groundwater mounding calculations would be required for each system unless basin bottoms are raised. However, based on the relative co-location of Basin A and the SAS it would be helpful to understand the interaction between the periodic stormwater discharge of this basin and the continuous septic discharge. It would be difficult to do this with an analytical model but could be done numerically (MODFLOW). It should be noted that additional stormwater discharge could reduce nitrogen load, but periodically temporarily increase breakout elevation.
- f) The DEP model would only apply to the Project. The systems to the south at 53 and 55 Farm Road are regulated under Title 5 which allows 440 gallons/day per acre. This statement assumes that these lots are not considered aggregate.

- **CLAWE 5/8/24 Response: \*\*\*Applicant response is lengthy. See Applicant May 8, 2024 Memo for response.\*\*\***
  - TT 5/20/24 Update: Revised hydraulic conductivity with new calculation methods and the saturated thickness values using elevations to MSL on the cross-section appear reasonable. Based on these values, the groundwater mounding calculations meet Title 5 and stormwater requirements.

As identified in the 2017 Land Court decision STEVENS vs. SHERBORN BOARD OF HEALTH, this Project is regulated in relation to nitrogen sensitivity in Title 5 Under 310 CMR 15.217 and not the aggregation of flow in 310 CMR 15.216. SeptiTech has an allowed loading of 660 GPD/acre with a total nitrogen of <19mg/l using the requirements of 310 CMR 15.217. This would allow a discharge of up to 9,240 GPD which is greater than the proposed volume. **In our opinion, this comment is resolved.**

60. The ZBA requested information related to resident comments heard in the October 4, 2023 meeting related to depth to bedrock and affects from any blasting at the Project site. In order to understand the affects of the Project on the surrounding areas, the Applicant should develop a geologic cross-section(s) that would show depth to bedrock, soil type, foundation elevations and seasonal high groundwater across the site. This will allow visual evaluation for the ZBA and the public for review.

- *CLawe 2/20/24 Response: A table of house unit with basement elevation, ledge, estimated high groundwater is added to sheets 12 and 13 of the comprehensive permit plan.*
  - TT 3/15/24 Update: Cross-sections of the Project would be easier for all parties to understand boundaries of bedrock across the site and potential need for blasting during construction. For example, groundwater breakout was observed along the Project frontage with Farm Road and ledge was encountered in test pits in this area suggesting subsurface geological features in the area that may not be entirely understood, and which could have measured impact on post-development groundwater conditions at the site and downgradient receptors. We continue to recommend geologic cross-sections of the site for additional clarification and ease of review by all parties.
  - *CLawe 4/17/24 Response: On Sheet 17 of 22 (Drainage and Sewer Profiles) we provided 5 profiles for the roads of the subdivision and in the profiles we showed the test pits where we encountered ledge and noted the ledge elevation. We have added a house summary table (see sheet 16) in which the estimated ledge elevation can be seen at the location of each house. We believe that the ledge information shown on the plans, on the road profiles, and on the house summary, that enough information has been provided so that boundaries of bedrock across the site can be determined and properly accessed for blasting work.*
    - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

## WETLANDS

Areas jurisdictional to the Massachusetts Wetlands Protection Act (WPA) are located on-site which include resource area to the west of the site and potential Isolated Land Subject to Flooding (ILSF) located at the southeast corner of the site. The following comments are offered specific to the Project's potential impact on wetland resources.

64. The proposed septic system is located upgradient of an approximate 20% slope and within the 100-foot buffer to the adjacent wetland to the west of the site. The Applicant shall provide documentation that septic effluent will not breakout of the slope and flow to the wetland.

- *CLawe 2/20/24 Response: Title 5 allows for 33% fill around septic field which is steeper than the natural 20% slope. As we showed in our groundwater table, the SAS area has deep soil and the normal high groundwater is almost at the same level of the wetland. The ground water mounding is less than 1 ft. See groundwater mounded analysis provided to the BOH for detail. Therefore, no breakout will occur.*
  - TT 3/15/24 Update: See Update at Comment 60.
  - *CLawe 4/17/24 Response: We believe that we have provided enough information to show that there will be no groundwater breakout within 100 ft of the SAS even with the larger (1.57 ft) updated groundwater mounding height. This is much more than the 50 ft minimal wetland setback requirement that is a natural groundwater breakout. Title 5 only requires 15 ft setback from 33% slope per 310CMR15.255 (2), which is steeper than the natural downgradient slope of the SAS for this project.*
    - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

65. The Applicant is reducing runoff and volume to the Farm Road Pond area in all storm events analyzed. The Applicant shall provide documentation that reduction in runoff to the area will not negatively impact private water supply, ground water supply, pollution prevention and wildlife habitat.

- *CLawe 2/20/24 Response: 1) as shown in the stormwater management report, the project site design applied low impact development style using country road and many swales and the infiltration basins well distributed to manage stormwater peak and volume. As a result, the overall site will have more*

water resources and more groundwater recharge meeting all DEP stormwater management standards. 2) The applicant provided nitrogen loading analysis and sited the SAS in an area with good soil condition and deep groundwater separation meeting drinking water standards at the downgradient receptor (property line and wetlands). Therefore, the project will not impact groundwater supply both in quantity and quality.

- TT 3/15/24 Update: The proposed stormwater design exceeds the required recharge volume by a wide margin, 2,256 cf required vs. 25,894 cf provided based on static volume in each basin below lowest outlets, plus additional as basins fill during storm events. Groundwater recharge is also provided in the swales and leaching catch basins which is not considered in the recharge accounting which will provide additional recharge volume. It is anticipated this level of recharge combined with surface discharge from the basins and SAS may increase flow (baseflow and overland flow) to the wetland. See Update at Comment 58 for commentary related to groundwater modeling.
  - **CLAWE 4/17/24 Response:** See response to Comment 58 for answer.
  - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

66. Filling is proposed adjacent to the pond and potentially within a revised limit of the potential ILSF. We recommend the Applicant provide analysis that flooding extents as a result of the proposed development will not impact abutting properties.

- **CLAWE 2/20/24 Response:** The Applicant provided a detailed survey of maximum flooding and compared with historical aerial photos to confirm the maximum flooding. The minor volume fill in the fringe of the flooding area (215.2 ft to 216 ft) will be compensated by more storage volume around the pond. Therefore, the abutting land will not be negatively impacted.
  - TT 3/15/24 Update: The Applicant is reducing surface runoff to CP #3 control point (ILSF) in the post-development condition. This should help decrease the timing and extent of flooding at the ILSF area in addition to the proposed compensatory storage. However, it appears the northern portion of the proposed 215.25 contour may be missing from the grading plan. All grading associated with the proposed compensatory storage should be shown on the grading plans for consistency.
  - **CLAWE 4/17/24 Response:** We checked the grading line for ILSF compensatory storage area and clarified the contour line at 215.25.
    - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

#### ADDITIONAL COMMENTS

68. Additional grading detail is needed at the discharge from DMH #3. It does not appear the proposed swale is graded to contain flow and direct to Basin A.

- **CLAWE 4/17/24 Response:** We checked the grading and updated the grading lines with head wall. The swale is also made deeper and steep downgradient of the pipe outfall to assure the flow to Basin A.
  - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

69. Due to potentially high groundwater conditions across the site, we recommend all utility trenches include bentonite or equal check dams to prevent groundwater migration through the trenches.

- **CLAWE 4/17/24 Response:** A typical cross section of bentonite or equal check dam has been added to the construction details and a note is added to the construction sequencing as note #9 and states that "All utilities shall be checked for groundwater conditions and bentonite, or equal check dams be added where high groundwater is observed."
  - TT 5/20/24 Update: **In our opinion, this comment is resolved.**

70. Elevations do not match between the Plan and construction detail for Basin B2.

- **CLAWE 4/17/24 Response:** The grading contours are checked and updated as needed. The top of berm elevation on the construction detail has been updated to match the plan.

Farm Road Homes – Comprehensive Permit  
Civil Engineering Peer Review  
May 20, 2024 Review Letter

- TT 5/20/24 Update: The B2 detail continues to show bottom of tank at 205.0 and bottom of stone at 205.0. **This should be corrected on the final Plans.**
- 71. The current design does not provide any protection from debris migration into the infiltration galleys at Basin B2. Grass clippings and other organic matter is expected to enter the galleys which have no means for inspection and maintenance. Inspection ports for the galleys are also recommended to ensure the limits of the galleys can be properly inspected.
- *CLAWE 4/17/24 Response: The grate access can provide access to the subsurface galley. It is updated so that the grate will be protected with filter fabric and crushed stones to prevent debris from entering the subsurface galley. One additional 4" inspection port is added to the end unit.*
- TT 5/20/24 Update: **In our opinion, this comment is resolved.**

These comments are offered as guides for use during the Town's review and additional comments are likely to be generated during the course of review. The Applicant shall be advised that any absence of comment shall not relieve him/her of the responsibility to comply with all applicable local, state and federal regulations for the Project. If you have any questions or comments, please feel free to contact us at (508) 786-2200.

Very truly yours,



Steven M. Bouley, PE  
Project Manager  
(Site/Civil Review)



Peter Dillon, PG  
Geoscience Discipline Lead  
(Water Supply/Septic Review)

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