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April 23, 2020

Ms. Beth Suedmeyer
Environmental Planner
Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, Massachusetts 01776

Re: Initial Peer Review of the Wastewater Treatment Facility proposed for the Cold Brook Crossing NRROD and SGOD Developments
Sudbury, Massachusetts

Dear Ms. Suedmeyer and Board Members:

The Horsley Witten Group, Inc. (HW) is pleased to provide the Sudbury Planning Board with this letter report summarizing our initial review of the proposed wastewater treatment facility (WWTF) for the Cold Brook Crossing development. The Applicant is proposing to develop approximately 25.8 acres with two residential components. The Apartments at Cold Brook Crossing project includes 6.2 acres of land to be developed under the Smart Growth Overlay District (SGOD) with 101 rental units housed in two buildings. The Cold Brook Crossing development consists of 19.6 acres with 123 townhouse units as well as a single four-story building with 50 condominium units pursuant to the North Road Residential Overlay District (NRROD).

A small portion of the development, specifically the WWTF and surrounding area is located within the 200-foot Riverfront Area of a perennial stream as well as the 100-foot buffer zone of a jurisdictional wetland resource area and will require to file a Notice of Intent (NOI) to the Sudbury Conservation Commission.

The Water Resource Recovery Facility plans and calculations were prepared by Onsite Engineering on behalf of Quarry North Road, LLC (Applicant). The proposed project includes the construction of 123 townhomes and three multifamily buildings as well as associated roadways, sidewalks, landscaping, utilities, a WWTF, and stormwater management. The proposed WWTF includes a gravity collection system, an on-site wastewater treatment plant and leach fields.

The following documents and plans, were received by HW:

- Application for Major Stormwater Management Permit, Cold Brook Crossing – NRROD, dated March 10, 2020 (2 pages);
- Application for Major Stormwater Management Permit, Cold Brook Crossing – SGOD, dated March 10, 2020 (2 pages);
- Application for Site Plan Approval & Application for Stormwater Management Permit, Cold Brook Crossing – Residential Housing Community, prepared by Civil Design Group, LLC, prepared for Quarry North Road, LLC, dated March 11, 2020;

- Stormwater Management Report for Cold Brook Crossing, prepared by Civil Design Group, dated March 11, 2020, (468 pages) including:
    - Stormwater Management Narrative
    - List of Figures
    - Hydrological Calculations
    - Hydraulic Calculations
    - Massachusetts DEP Stormwater Report Checklist
    - Illicit Discharge Statement
    - Operation and Maintenance Plan & Long-Term Pollution Prevention Plan
- Application for Final Plan Approval of NRROD Master Plan, Cold Brook Crossing, received by Town of Sudbury on March 11, 2020 (6 pages);
- Application for SGOD Plan Approval, Cold Brook Crossing, received by the Town of Sudbury on March 11, 2020 (6 pages);
- Site Plan Narrative (9 pages) with attachments for Cold Brook Crossing, prepared by Civil Design Group, LLC, dated March 11, 2020;
    - Attachment B: Project Figures (10 pages)
    - Attachment C: Land Disposition and Development Agreement (28 pages)
    - Attachment D: MassDEP Land Conveyance Approval (3 pages)
    - Attachment E: MEPA Certificate (20 pages)
    - Attachment F: Wastewater Management System Operational Duties (80 Pages)
    - Attachment G: Construction Detail Plan (16 pages)
    - Attachment H: Fiscal Impact Study (23 pages)
    - Attachment I: Groundwater Resource Overlay District (171 pages)
    - Attachment J: Architectural Renderings (39 sheets)
    - Attachment K: Traffic Impact and Access Study (125 pages)
    - Attachment L: Landscape, Lighting, Signage (12 sheets)
    - Attachment M: Civil Engineering Plans (32 sheets)
    - Attachment N: Leach Field Plans (2 sheets)
    - Attachment O: Wastewater Treatment Plans (10 sheets)
- Site Plans, Cold Brook Crossing, prepared by Civil Design Group, dated March 11, 2020, (32 sheets) including:
    - Cover Sheet 1
    - Legend & Notes 2
    - Existing Conditions Plan (Sullivan, Connors and Associates)
    - Site Context Plan 4
    - Site Preparation & Erosion Control Plan 5
    - Overall Layout Plan 6
    - Layout Plan (A/B/C) 7-9
    - Grading & Drainage Plan (A/B/C) 10-12
    - Utility Plan (A/B/C) 13-15
    - Plan & Profile Sheets 16-24
    - Construction Phasing 25
    - Construction Details 26-32

Wastewater Review

HW has reviewed the proposed wastewater disposal system design per the Guidelines for the Design, Construction, Operation, and Maintenance of Small Wastewater Treatment Facilities with Land Disposal, dated July 2018; Rules and Regulations Governing the Subsurface Disposal of Sewage, Sudbury Board of Health, in effect March 26, 1998; and 310 CMR 15.00: Septic Systems ("Title 5"), as applicable.

Design Calculations

1. The narrative does not break down the subtotals of bedrooms (i.e. there will be 101 one, two-, and three-bedroom rental units), because of this, it is difficult to verify the total bedroom count listed on the plans.
2. The design flow calculated is based on the number of bedrooms and the number of age-restricted units for a total flow of 49,730 gallons per day (gpd). However, the actual design flow is also listed as 49,755 gpd on the plans, which is 25 gpd higher than the bedroom count design flow. There is a clubhouse and potentially office flow that may account for this additional flow. HW recommends that the Applicant confirm that the design flow includes any additional areas other than bedrooms (such as fitness room, meeting room, and other amenities) as required.
3. The design flow of 49,755 gpd is a maximum daily flow. The average daily flow is 50% of 49,755 gpd or 24,878 gpd, which is less than the threshold average daily flow of 50,000 gpd. Therefore, there is no redundancy requirement necessary in accordance with the Guidelines for the Design, Construction, Operation, and Maintenance of Small Wastewater Treatment Facilities with Land Disposal.

Piping System / Manholes

4. The sewer manholes and pipes are very deep which will increase construction costs as well as maintenance costs. It appears that the reason for this is that the building inverts are located six feet beneath the lowest floor elevation (GF). HW recommends that the Applicant review the proposed sewer pipe and manhole elevations and consider raising the sewer inverts and gravity collection system to reduce the depth of sewer pipe and manholes.

Treatment

5. The proposed design includes eight to nine feet of cover over the precast tanks. HW recommends that the Applicant confirm with the tank manufacturer the depth of cover allowed for the load rating of the precast tanks.
6. All pump chambers including the equalization tank and the final effluent pump chamber should provide a water-tight hatch for easy access to remove the pumps. Portable pump hoists should be considered in the detailed design.
7. Information is required in the detailed design for the pump on/off and alarm elevations throughout the treatment processes including influent equalization pumps, and final effluent pumps. The design provided for the Ground Water Discharge Permit (GWDP) application is typically at 50% design.

8. The piping inside all pump chambers and valve vaults should be ductile iron instead of PVC.
9. The proposed screen system should be installed in a separate building because of the odor and hydrogen sulfide concern. Alternatively, the detailed design should demonstrate how the odor and hydrogen sulfide problem will be managed.
10. The proposed treatment process for biological oxygen demand (BOD), total suspended solids (TSS), and total nitrogen (TN) appears to be adequate. However, the proposed granulated activated carbon (GAC) system should be reviewed and confirmed. A typical influent total organic carbon (TOC) is approximately 25 mg/L, the GAC may not be able to remove adequate TOC to achieve less than 1 mg/ L in a single pass. The Applicant may need to consider multiple GAC tanks in series or another treatment technology.
11. HW recommends that the detailed design verify that there is adequate head space between the monorail and the top of the membrane bioreactor (MRB) system to remove the membrane cartridge.
12. Each chemical, such as sodium bicarbonate and Micro C, should have its own containment area, which is 110% of the chemical holding tank.
13. HW recommends that the detailed design consider proper drainage from the emergency shower location.
14. HW recommends that the Applicant verify the information provided in the schedule of elevations (Sheet M-2), especially the screen system, MRB, GAC system, and ultraviolet (UV) disinfection. It appears that the elevation for the pre-treatment tank #1 invert out should be 128.85 (Sheet M-2).
15. HW recommends that a detail be provided for the Final Effluent Pump Chamber.
16. It appears that the proposed grading slopes toward the treatment building. HW recommends that the proposed grading be sloped away from the building to avoid any stormwater from flowing into the building.

<u>Disposal</u>

17. The design plan should show the setback requirement to all basements surrounding the leach field and reserve leach field area.
18. The design plan (M-2) mentioned that the leach field is designed for 37,380 gpd. However, the sewerage absorption system (SAS 2) details show a design capacity of 51,003 gpd, which is higher than 49,755 gpd.
19. The leaching field reserve indicates a capacity of 25,500 gpd, which is 50% of the design SAS capacity of 51,003 gpd. The proposed reserve area is under a steep slope and may be a challenge to construct if needed.
20. The existing grade at the proposed leach field/SAS is between 152 and 172. The proposed bottom of the leaching chambers is 155.67. A significant amount of grading will be required to construct the leach field/SAS.

General

21. The full occupancy of the proposed development may take several years to achieve. A bypass of one of the pretreatment tanks should be reviewed and considered. Alternatively, the Applicant should consider the overall BOD loading.
22. Grease traps are shown for three of the buildings. HW recommends that the details and sizing calculations for these grease traps be provided.
23. The Site Plans and the Water Resource Recovery Facility plans both contain details for sewer manholes and pipes that differ. HW recommends that the Applicant review both sets of details for consistency.
24. The Applicant should identify the owner of the WWTF including the sewer collection system in the GWDP. The Applicant should be aware of a one-time contribution to an Immediate repair and replacement reserve, which is 25% of the estimated construction cost of the WWTF.
25. There are many utility crossings. HW recommends that the Applicant review the elevations to ensure there are no conflicts, particularly with the gravity drainage pipes.

Conclusions

HW recommends that the Sudbury Planning Board require that the Applicant address these comments and provide a written response as part of the permitting process. The Applicant is advised that provision of these comments does not relieve him/her of the responsibility to comply with all Town of Sudbury Codes and Bylaws, Commonwealth of Massachusetts laws, and federal regulations as applicable to this project. Please contact Janet Carter Bernardo at 857-263-8193 or at jbernardo@horsleywitten.com if you have any questions regarding these comments.

Sincerely,

HORSLEY WITTEN GROUP, INC.

Janet Carter Bernardo, P.E.
Senior Project Manager

F.P. Lee, P.E.
Associate Principal, Principal Engineer