

Horsley Witten Group

Sustainable Environmental Solutions

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June 9, 2020

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

Re: Third 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 third 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 the filing of 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 additional documents were received by HW in response to our initial peer review dated April 23, 2020 and our second review letter dated May 26, 2020:

- Memorandum to Adam Duchesneau, prepared by Chris Claussen, dated April 13, 2020 (2 pages).
- Memorandum to Chris Claussen, prepared by Provencher Engineering, LLC., dated April 27, 2020 (2 pages).
- Memorandum to Chris Claussen, prepared by Civil Design Group, LLC., dated April 27, 2020 (3 pages).

- Memorandum to Beth Suedmeyer, prepared by Onsite Engineering, Inc., dated April 28, 2020 (3 pages).
- Memorandum to Beth Suedmeyer, prepared by Chris Claussen, dated June 1, 2020 (6 pages).

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. The following comments correlate to our April 23, 2020 initial wastewater peer review, follow up comments were provided on May 26, 2020 in **bold** font, additional comments are provided in *italic* font.

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.

Provencher Engineering responded that a summary table was provided to the Town and attached to the response memo. However, there was no table attached to the memo received by HW.

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The summary table has been provided. No further action is required, the Applicant has adequately addressed this comment.

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.

Provencher Engineering responded that design flows have been discussed with MassDEP. HW defers to MassDEP for the accepted design flow.

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.

The Applicant has adequately addressed this comment.

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.

The Applicant has not provided a response for this comment.

June 9, 2020:

The Applicant has responded that they have reviewed the proposed sewer pipe inverts and manhole elevations and state that the elevations are controlled by site geometry and gravity. Additionally, the required plumbing for the garage floor drains are apparently driving the elevations down, requiring the entire gravity system to be deep.

HW agrees that geometry does control the gravity design. The proposed roadway grade in the area of these proposed buildings is being raised by 10-16 feet so it is not the natural topography that is limiting the design.

The Applicant has proposed SDR-26 (heavy duty) pipes with a bury depth of more than 10 feet as noted on Sheet 2 of the plans. HW has no further comment but to acknowledge that deep pipes may be an issue to repair in the future.

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.

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.

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.

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation. Additionally, a water tightness test should be performed as part of the installation.

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.

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.

8. The piping inside all pump chambers and valve vaults should be ductile iron instead of PVC.

Onsite Engineering responded that it is their opinion that SCH 80 PVC pipe is appropriate. HW's concern is based on the pressure on the pipe during startup and also during winter conditions. There may not be a problem during the 12-month warranty period but it is our experience that ductile iron is the preferred material in this situation.

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.

Onsite Engineering's response that the downstream process is not Class 1, Division 1 is correct. However, the screening is questionable. Can the design Engineer guarantee that the pretreatment unit will remove 100% of solids and not biodegradable solids? The screen area should be isolated with proper ventilation.

June 9, 2020:

The Applicant has provided several options as a response. As stated in the response to comments, the first option is preferred and will be altered as needed. No further action is required.

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.

Onsite Engineering responded that the proposed system is expandable should actual conditions differ from design conditions and references a treatment TOC concentration of less than 5 mg/l, which may not meet the requirements of the GWDP.

June 9, 2020:

The Applicant has responded that the plant will be monitored, reporting to DEP, and adjusted as needed.

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.

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.

12. Each chemical, such as sodium bicarbonate and Micro C, should have its own containment area, which is 110% of the chemical holding tank.

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.

13. HW recommends that the detailed design consider proper drainage from the emergency shower location.

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.

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).

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.

15. HW recommends that a detail be provided for the Final Effluent Pump Chamber.

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.

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.

Civil Design Group responded that there is a proposed swale on the western and northern sides of the proposed building. HW recommends that additional spot grades be added to the plan so that it is clear a swale is proposed in this location. Additional spot grades on the southern side of the building (between the building and the driveway) would also be helpful to ensure positive drainage, especially around the door.

June 9, 2020:

The Applicant had originally stated in the response letter that no further response is required at this time, but has further clarified that the area in question below will be de minimis and would not be able to make it to the building because it would be intercepted by the porous sidewalk. HW has no further comment.



Disposal

17. The design plan should show the setback requirement to all basements surrounding the leach field and reserve leach field area.

The Applicant has adequately addressed this comment.

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.

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.

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.

The Applicant has acknowledged this comment.

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.

The Applicant has acknowledged this comment.

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.

The Applicant has adequately addressed this comment.

June 9, 2020: It should be noted that at the meeting on May 27th, the Applicant agreed to install a bypass to the system.

22. Grease traps are shown for three of the buildings. HW recommends that the details and sizing calculations for these grease traps be provided.

The Applicant has clarified that gas traps are proposed, not grease traps. HW defers to MassDEP and appropriate Town Departments for approval of this connection/structure in lieu of a tight tank or grease trap.

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.

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.

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.

The Applicant has not provided a response for this comment.

June 9, 2020:

The Applicant has adequately addressed this comment, the owner will be Quarry North Road LLC and they are aware of the requirements.

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.

The Applicant has adequately addressed this comment.

Conclusions

HW is satisfied that the Applicant has adequately addressed our comments. The final plans should be reviewed by the Town prior to construction. 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