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November 30, 2020

Truro Zoning Board of Appeals
c/o Ms. Barbara Carboni, Esq., KP Law, P.C.
101 Arch Street, 12th Floor
Boston, MA 02110

RE: Additional Review of the Performance of the Proposed Wastewater Treatment Facility for the Cloverleaf Community

Dear Ms. Carboni and Board Members:

As you requested, I conducted an additional evaluation of the performance of the proposed BioMicrobics BioBarrier® wastewater treatment facility that is proposed to treat wastewater effluent generated at the Cloverleaf Community.

In our initial review, we recommended that the applicant incorporate a treatment technology that meets a wastewater effluent standard for nitrogen of 10 mg/L. This level of treatment was recommended to improve the protection of downgradient private wells and is consistent with the treatment requirements for larger wastewater facilities with flows about 10,000 gallons per day that are permitted by the Massachusetts Department of Environmental Protection under their Ground Water Discharge Regulations (310 CMR 5.00).

Since that review, the Zoning Board of Appeals has had additional discussions about level of treatment and the long-term reliability of the proposed technology. I asked the applicant's engineer, John O'Reilly, if he could provide more information on effluent testing for the system at other sites where it is in use. I also asked if the system could be expected to reach an average effluent concentration below 10 mg/L. Mr. O'Reilly provided additional performance data for the BioBarrier system in Westport, MA. He also informed us that the facility in Westport was designed to achieve a nitrogen concentration in the treated effluent of 5 mg/L.

The performance data provided for the Westport system shows the facility has achieved an average of 4.77 mg/L of nitrogen in the effluent over the last 16 months. Five of the sixteen monthly samples contained nitrogen at a concentration above 5 mg/L. Two of them were in the first two months of sampling and could be related to the startup of the system. Three other samples exceeded 5 mg/L, one at 8.8 mg/L and the other two between 5- 6 mg/L (see enclosed data table). It is my understanding that the design for the Cloverleaf Community project could be modified to provide nitrogen treatment levels in the range of this Westport system, with an average nitrogen concentration of 5 mg/L.

I recommend that the Zoning Board consider requiring the applicant to adjust the design of the wastewater treatment system to reach a higher level of nitrogen removal. The Board could request that the system design be adjusted to meet a goal of achieving an average nitrogen concentration of 5 mg/L, and should not, after the first six months of operation, exceed a nitrogen concentration of 10 mg/L.

Based on the data from the Westport system, it is reasonable to expect that if the system is designed to reach a nitrogen concentration of 5 mg/L, there will be times that the measured concentration is slightly above this level especially because of the regular variations in the wastewater strength discharged into the system. Designing the system to meet a 5 mg/L average concentration and setting a maximum threshold of 10 mg/L provides added protection to the downgradient private wells.

The performance data for the BioMicrobics system in Westport also shows that it is removing 99% of the Total Suspended Solids (TSS) and 99% of the Biological Oxygen Demand (BOD) from the effluent. TSS and BOD measurements provide an indication of the level of treatment of other compounds typically found in wastewater. The TSS and BOD removal data indicate that many of these other contaminants are being treated, along with the nitrogen removal that is provided.

Sincerely,

HORSLEY WITTEN GROUP, INC.

Mark E. Nelson, P.G., LSP
Principal