

October 11, 2024

Abby Conroy
Director of Land Use
Town of Salisbury
PO Box 548
27 Main Street
Salisbury, CT 06068

**Subject: Hydrogeology Review
SWSA Snow Pond
Indian Cave Road, Salisbury, Connecticut**

Dear Abby:

Weston & Sampson Engineers, Inc. (Weston & Sampson) was retained by the Town of Salisbury Land Use Department (the Town) to review the hydrogeologic aspects of a proposal by the Salisbury Winter Sports Association (SWSA) to construct a snowmaking pond on their property at 80 Indian Road in Salisbury Connecticut. As part of this assignment, Weston & Sampson completed the following activities:

- Review of the report, titled “Hydrogeologic Report, SWSA Snow Pond” prepared by Patrick R Hackett, P.E., dated September 23, 2024.
- Review of Site Plans and Drawings prepared by Patrick R. Hackett, P.E., dated July 18, 2024, titled
 - 100-Scale Existing/Proposed Site
 - 20-Scale Pond Plan
 - 20-Scale Section
 - 20-Scale Section2 & Details
 - Erosion & Sediment Control Plan
 - 40-Scale Pond Spoils Fill Areaand associated Site Plan
- Review of the Town of Salisbury, Conservation Commission, Application for Regulated Activity Permit for construction of a farm pond for water supply, snow making submitted by SWSA (the Applicant), including maps prepared by Lamb Kiefer Land Surveyors dated February 22, 2024, and a report, titled “Project Narrative and Wetlands Evaluation” prepared by Jay Fain & Associates, LLC, dated July 2023.
- Review of readily available published hydrogeologic information for the project area
- A site inspection of the proposed project area on October 10, 2024, attended by Rob Good of Weston & Sampson, Mat Kiefer, Vice President of SWSA representing the Applicant, the project engineer for the Applicant Patrick Hackett, P.E., and the project soil scientist for the Applicant Jay Fain.

Proposed Project

SWSA proposes to construct an approximately 0.25-acre pond within a Red Maple Swamp wetland adjacent to and north of the ski jump landing area. The proposed pond, referred to herein as the Snow Pond, will provide water storage for snow-making operations. Excavated material from the proposed

Snow Pond would reportedly consist of approximately 900 cy (cubic yards) of organic material and 2,950 cy of sand and gravel. The excavated material will be placed in an upland area adjacent to and south of the 30-meter ski jump, and outside of a Regulated Area.

The Snow Pond would be excavated to approximately 12 ft bg (feet below grade), from a maximum grade elevation of 669 ftmsl (feet above mean sea level) to elevation 657 ftmsl. Water-level measurements made in a shallow water-supply well immediately south of the proposed Snow Pond area that is currently used to supply water for snow making were used to determine a normal pond elevation in the proposed Snow Pond of 667 ftmsl. The intake for a suction pump would be set at approximately 661 ftmsl to provide approximately 6 feet of available storage, equating to approximately 415,000 gallons.

The current well source has an estimated stabilized yield of 58 gpm (gallons per minute), which limits withdrawals to less than 50,000 gpd and results in long continuous pump cycles for snow making. The proposed Snow Pond would support higher withdrawal rates and shorter more efficient pump cycles for snow making.

Hydrogeologic Setting

The Snow Pond would be located within unconsolidated glacial outwash deposits of sand and gravel, bounded to the east and underlain by glacial till sediments. The bedrock beneath these sediments is the basal marble member of the Walloomsac Schist.

The project area exists within the Housatonic Major Basin, Housatonic Main Stem Regional Basin, Spruce Swamp Creek Subregional Basin and Local Basin No. 6006-00, covering a drainage area of approximately 1.7 square miles. The contributing drainage basin for the proposed Snow Pond is approximately 4.2 acres.

Groundwater in the gravel and till sediments is expected to exist under phreatic water-table conditions, perched within deeper portions of the till, and partially confined to confined in bedrock. The local topography indicates the potential for an upward vertical hydraulic gradient (VHG) beneath the Snow Pond and a groundwater flow direction to the south and southeast.

The wetland hydrology in the vicinity of the proposed Snow Pond is likely supported by groundwater storage/retention in the gravel sediments, stormwater runoff for the contributing drainage basin and groundwater discharge from the bedrock and till when climatic conditions support an upward VHG.

Sensitive Receptors

Potential sensitive receptors to changes in the hydrology from construction and operation of the proposed Snow Pond could include nearby groundwater-supply wells and surface-water resources, inventoried to including the following:

- Potential Groundwater Receptors
 - Salisbury System Public Water Supply Wells: Aquarion Water Company of CT, Level A adopted 2008; Aquifer Protection Area (APA) No. 25; CT1220011; approximately 1,000 feet south
 - Potential private well serving residence at 82 Indian Cave Road; approximately 400 feet north

- Potential private well serving 54 Indian Cave Road; approximately 850 feet south
- Potential Surface-water Receptors
 - Unnamed Pond; approximately 550 feet north at elevation 670 ftmsl
 - Outlet watercourse from Unnamed Pond and tributary to Spruce Swamp Creek; approximately 750 feet north and northwest at elevation 670 to 665 ftmsl
 - Spruce Swamp Creek; approximately 600 feet west at elevation 660 to 662 ftmsl
 - Wetland areas on SWSA property and outlet tributary to Spruce Swamp Creek; immediately north and approximately 250 to 750 feet south at elevation 669 to 659 ftmsl

Evaluation of Potential Impacts

In our professional opinion, based on a review of the application documents, the proposed project, hydrogeologic setting and potential sensitive receptors, we conclude the construction and operation of the proposed Snow Pond will not result in adverse impacts to the hydrology that supports the identified potential receptors.

Our conclusion is supported by the following findings:

1. The Applicant indicates construction of the proposed Snow Pond will occur during the summer months, when groundwater levels and wetland hydrology is already affected by seasonal dry conditions. This schedule will reduce the pumping rates and zone-of-influence associated with dewatering.
2. The anticipated duration of dewatering for construction of a 0.25-acre pond, and the corresponding impacts to groundwater levels will be limit and temporary.
3. The published geologic maps and test pits indicate the shallow overburden sediments are relatively transmissive, homogenous and isotropic, with some stratification but without any significant aquiclude that could limit and/or confine groundwater flow. As such, the proposed Snow Pond should not have a significant change on the local hydrology or hydrology that supports the local and nearby groundwater and surface-water receptors.
4. Placement of the excavated material on-site, in an upland area, will not result in a significant adverse impact to the quantity and quality of stormwater runoff that supports the hydrology of the onsite wetland and tributary to Spruce Swamp Creek located south of the proposes Snow Pond.
5. It appears that current and historical land use within the proposed Snow Pond area and contributing watershed would not have resulted in release of contaminants that could impact the material that would be excavated from the proposed Snow Pond and placed on-site. Therefore, the reuse of this material should not be subject to the soil-use regulations promulgated under Section 22a-133k-2(h) of the Connecticut Remediation Standard Regulations. Similarly, the quality of dewatering fluids should be adequate for direct discharge to surface water without treatment except for removal of suspended solids and visual turbidity.
6. Withdraw of surface water from the proposed Snow Pond during normal snow-making operations will occur during the winter months, when the significance of potential adverse impacts to wetland and watercourse hydrology is reduced.

7. The potential for pumping-induced impacts to nearby surface-water resources is further mitigated by separation distances, the relative elevations and the aquifer characteristics.
8. The proposed Snow Pond will accommodate higher instantaneous withdrawal rates when compared to the existing well, but with more efficient snow-making operations and shorter pump-cycle times.
9. The existing well has reportedly been used for snow-making operations for more than 40 years. The total seasonal withdraw and the average daily withdrawal rates from the proposed Snow Pond should be consistent with existing conditions. The water source for the existing well and proposed Snow Pond is derived from the same shallow aquifer. In that respect, the proposed Snow Pond is effectively a larger diameter well that more efficiently disperses the pumping-induced impacts but with a similar zone-of-influence to the existing well.
10. The proposed Snow Pond area and contributing watershed is relatively small compared to the watershed areas that support the potential receptors, further mitigating the potential for impacts.
11. Evaporative losses from the proposed Snow Pond will be greater than the corresponding transpiration losses under existing conditions, but a significantly small percentage of the overall water budget for the contributing watershed so as not to result in significant adverse impacts.
12. The suction-pump intake set at elevation 661 ftmsl, will limit the maximum water-level drawdown in the pond to approximately 6 feet, which further limits the potential impacts.
13. The potential for pumping-induced impacts to nearby water-supply wells is mitigated by the separation distances, the expected well-construction depths compared to the maximum water-level drawdown in the proposed Snow Pond, and winter season withdrawal. Also note that the proposed Snow Pond is located outside of the APA for the Aquarion wells.

Recommendations

Weston & Sampson makes the following recommendations to support our findings and conclusions:

1. The applicant be requested to confirm and document the supposition made under Finding No. 5 above about the current and historical environmental conditions within the proposed Snow Pond area and contributing watershed.
2. The applicant be requested to make observations during construction and dewatering of the Snow Pond to confirm the hydrogeology, aquifer-recharge potential and anticipated operational water-levels in the Snow Pond.
3. The applicant be requested to conduct water-level monitoring within nearby groundwater and surface-water receptors during construction and dewatering of the Snow Pond there are no significant impacts.

We appreciate the opportunity to provide this consultation to the Town. If you have any questions concerning our review, findings and conclusion or require additional information, please contact Rob Good at (959) 777-5820 or good.rob@wseinc.com.

Sincerely,

WESTON & SAMPSON ENGINEERS, INC.

A handwritten signature in black ink, appearing to read "Rob F. Good, Jr.", written in a cursive style.

Rob F. Good, Jr., CPG, LEP
Senior Technical Leader - Hydrogeology

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