



March 22, 2023

Overnight Mail/Email (rgendreau@sturbridge.gov)

Sturbridge Conservation Commission
301 Main Street
Sturbridge, MA 01566

Re: DEP File #CE300-1156
Blueberry Hill Estates
Lot 3 Berry Farms Road
Sturbridge, Massachusetts

[LEC File #: MCEI\20-002.04]

Dear Members of the Commission:

On behalf of the Applicant, Justin Stelmok, LEC Environmental Consultants, Inc., (LEC) is submitting the following supplemental responses to staff comments outlined within the March 9, 2023 Conservation Commission Detailed Agenda and Commissioner feedback from the March 9, 2023 Public Hearing.

Staff Comments

- Project site is an approx. 41.4 acre lot which has recently been subdivided from a larger parcel. The subdivision contains commercial and residential lots as the original properties (30 Main & 20 Fiske Hill) were located in both zones (residential and commercial). A roadway w/ the lot subdivision was proposed and permitted under DEP File #300-1086 by the property owner. At that time, one vernal pool was located within the buffer zone of that work. A small amount of work was proposed at the extent of the 200-foot vernal pool buffer zone. At that time, it was noted that future work could present challenges meeting performance standards based on that proposal. This was due to the presence of the vernal pool and the location of wetlands. A potential hardship could be created by the proposal.

Response

As reviewed within the Notice of Intent (NOI) Application submitted to the Commission, the proposed Blueberry Hill Estates project, a 55+ Housing Community ("Manufactured Housing Community"), has been designed in compliance with the Massachusetts Wetlands Protection Act ("WPA", M.G.L., c. 131, s. 40), its implementing Regulations (310 CMR 10.00; the "WPA Regulations"), and the Town of Sturbridge Wetlands Bylaw (Chapter 286) and its implementing Wetlands Regulations (Bylaw Regulations).

The project proposed within the Buffer Zone complies with the Bylaw Regulations setback requirements and performance standards. To reiterate, no work is proposed within the 25-foot Buffer Zone to BVW or the 100-foot Vernal Pool Buffer Zone and no structures occur within the 50-foot Buffer Zone to BVW

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(minimum setbacks) as required under the *Bylaw Regulations*. Only five (5) structures, or portions thereof (dwelling units, garages, or decks), occur within the outer 100-foot Buffer Zone to BVW, while only eight (8) structures, or portions thereof, are located within the outer 200-foot Vernal Pool Buffer Zone. Work activities within the 200-foot Buffer Zone to BVW and Vernal Pools have been designed to avoid, minimize, and mitigate potential impacts to the downgradient Resource Areas as reviewed further below and within the NOI Application and supplemental materials.

### Staff Comments

The following staff comments relate to Vernal Pools and their 200-foot Buffer Zone. A cumulative response is provided below:

- *As noted in SWB Regs 365-1.4 Sturbridge has a Vernal pool buffer which states that: “the first 100 feet is to be considered the minimum “no disturb” buffer. This buffer zone may be extended to 200 feet based on site conditions and impacts to critical wildlife habitat needed to keep the pool viable.*
- *SWB Regs 365-5.6 E. state: “Any work with in the 200-foot buffer zone to a vernal pool shall not cause a significant adverse impact to any function of a vernal pool. It shall not result in a measurable decrease in extant wildlife populations or biological community composition, structure and species richness of the site or in the vicinity, exclusive of the present or future state of adjacent or nearby property, or impair, damage or reduce in value for wildlife purposes identified specific habitat features. The Commission shall take into account indirect effects, including but not limited to effects of nearby human activities, on a case-by-case basis.”*
- *Direct and indirect impacts to vernal pools has been a significant concern throughout the review of this project. See Oxbow peer review reports. Not only is the loss of habitat a concern but habitat fragmentation and impacts to water quality.*
- *Through previous filings, the project has been revised as a result of peer review comments specifically to address impacts to vernal pool habitat. As outlined in SWB Regs and noted above, vernal pool habitat extends beyond the wetland perimeter of the pool and includes upland areas. The project proposes substantial loss of habitat surrounding the vernal pools and bisects the habitat. This was noted of concern by Oxbow Associates. Oxbow noted a review of studies which stated that mole salamander populations exist and depend upon habitat over 540 feet from wetlands. Oxbow recommended that the board require that the 200-foot vernal pool habitat be protected for these reasons as outlined in the regulations. There does appear to be substantial impacts within 540 feet to the vernal pools on this lot.*

### Response

The proposed project does not result in a substantial loss of habitat within the jurisdictional 200-foot Vernal Pool Buffer Zone. As reviewed within LEC’s NOI Report (and below), the project proposes to cumulatively disturb, including impervious structures, driveways, roadways, rain gardens, and lawn/landscaped area (permanent disturbance), a total of 25,970± s.f. (0.6± acres) within the 200-foot Buffer Zone in comparison to permanently protecting 479,981± s.f. (11.02± acres) of upland within 200 feet of the Vernal Pools. The table on page 13 of LEC’s NOI Report and included below provides a breakdown for each of the three



Vernal Pools. The cumulative 5.4% of permanent disturbance within the 200-foot Vernal Pool Buffer Zone, in comparison to upland Open Space to be protected within 200 feet of Vernal Pools, represents an insignificant impact.

The proposed project has been designed to have no significant adverse impacts to the on and off-site Vernal Pools. The proposed revisions have been designed to avoid and minimize disturbance within the 200-foot Vernal Pool Buffer Zone to the greatest extent feasible, as recommended by the Commission, staff, and Oxbow. Significant project revisions have been incorporated, as reviewed in detail on page 8 of LEC's NOI Report, including providing an expanded habitat corridor/ connection between the southerly A-series Vernal Pool and E-series Vernal Pool. Three lots have been eliminated and the abutting lots have been consolidated to maximum the width of the proposed habitat corridor/connection, totaling 140± feet wide on the west side of Proposed Drive A (between Lots 66 and 69) and 110± foot wide on the east side (between Lots 4 and 6).

While portions of the project footprint and site within 500 feet of Vernal Pools do not maintain slopes greater than 8%, additional upland habitat beyond the 200-foot Vernal Pool Buffer Zone will remain undisturbed and/or permanently protected on-site (7.2± acres).

The project, as currently proposed, is not anticipated to result in a measurable decrease in extant wildlife populations, including Spotted Salamanders, Fairy Shrimp, or general wildlife species; or negatively impact biological community composition, structure and species richness of the Site or in the vicinity; or impair, damage or reduce in wildlife habitat value or functions/values. Ample terrestrial habitat and migratory corridors will be maintained around the on-site Vernal Pools, including the connection between the southerly A-series and E-series Vernal Pools. The proposed project has been designed to maximize setbacks and minimize potential migratory impacts. The Applicant is proposing to implement a Reduced Salt Application Plan and a comprehensive Vernal Pool Monitoring Program to ensure the protection of the Vernal Pools. As proposed, the project will not result in a cumulative significant adverse impact on the Resource Areas, including the on-site Vernal Pools.

#### Staff Comments

- *A crossing structure is proposed within one location to provide habitat connectivity. A 4 sided box culvert 6'x4' is proposed. A re-created natural substrate will be provided and grates for light. A grated bridge or 3 sided structure would be best as natural light has been found for amphibians to use these structures. A few grates may not provide as much light for them to enter. In addition, maintenance is required to maintain the natural surface. Maintenance is proposed but needs follow up to ensure it is done. O & M compliance is challenging. An elevation or drop to enter the structure or loss of natural surface can prevent them from using it. This is the only connection provided. There are no forested strips provided between the developments for amphibians or other wildlife to cross. Are there any studies which support amphibian use of this structure? A full review of alternatives, pursuant to SWB Regs should be provided for the board to consider the 4-sided box culvert vs. Oxbow's recommendations. Staff had previously recommended that another location of at least forest be provided to allow for crossing generally in location of house #13. The addition of forested strips may be extremely valuable for all wildlife trying to cross this site.*

## Response

The four-sided 4-foot-tall by 6-foot-wide box culvert, as depicted on Sheet C30 of the *Site Plans*, has been primarily designed to facilitate the potential movement of Spotted Salamanders and Wood Frogs between the southerly A-series Vernal Pool and E-series Vernal Pool. A crossing structure has been integrated based on Commission, Staff, and peer review comments and has increased from a 2' by 2' to a 3' by 5' to the current 4' by 6' design. As currently proposed, the crossing structure will also serve to facilitate the movement of small mammals, reptiles, amphibians, and invertebrates. Larger mammals (e.g., white tailed deer) will be able to cross over the roadway at the habitat corridor. As corroborated by Oxbow during the prior Public Hearing review process, wider forested strips within other areas are not necessary to accommodate wildlife passage through (i.e., between Lots 13 and 14) or around the development.

Retaining walls with flared ends are proposed along the west and east sides of proposed Drive A to help direct migrating wildlife towards the crossing structure. The crossing structure itself is located approximately 197± feet from the southerly A-series Vernal Pool and 270± feet from the E-series Vernal Pool. The crossing structure itself is only 30 feet long. Three (3) 24-inch by 24-inch grates are proposed on the top of the crossing structure to allow for adequate sunlight and moisture. The grates have been strategically located within the roadway travel surface to maximize sunlight and moisture, while avoiding the above retaining walls, guardrails, curbing, gutter, and/or sidewalk (for ADA reasons). Six (6) inches of natural substrate (soil/leaf litter) will be distributed within the bottom of the culvert. The natural substrate/leaf litter and retention of moisture will prevent desiccation of migrating amphibians. While the design allows for adequate sunlight during daylight hours; it should be noted that the majority of amphibian spring migration occurs at night.

As noted in LEC's NOI Report and included under Appendix D, the proposed 4' by 6' crossing structure dimensions exceed that of a recent NHESP-approved 4' by 4' crossing structure to promote the migration of state-listed rare Marbled Salamander (*Ambystoma opacum*) and Eastern Box Turtle (*Terrapene carolina*).

A larger, grated bridge crossing structure was investigated, but determined to be cost prohibitive, with costs exceeding \$300,000.00. As stated under the *Bylaw Regulations*, a "practicable alternative" is an available and feasible alternative which will accomplish the project's purpose, taking into account costs, logistics, the proposed use and the most current technology. The purpose of the project is to fulfill a (55+) housing need for the Town of Sturbridge that is more affordable to residents. Adding a \$300,000+ bridge changes the purpose of the project and therefore should not be considered a practicable alternative. Furthermore, a larger, grated bridge crossing structure is not warranted to facilitate wildlife movement through the upland habitat corridor, especially Spotted Salamanders and Wood Frogs, and in the consideration of the setbacks to the Vernal Pools and surrounding protected habitat areas. A larger, grated bridge may be more appropriate for a wetland crossing, but not for a roadway 200+ feet removed from the Vernal Pools.

An Operations and Maintenance Plan (O&M Plan) will be implemented to ensure the crossing structure functions as intended. Specifically, the O&M Plan is proposed to keep the retaining walls free of vegetation and ensure the crossing structure and grates are kept free of debris, in addition to maintaining six inches of natural substrate on the bottom. Annual site inspections can be scheduled in March (following snow melt) to

ensure the crossing structure is in good order ahead of spring amphibian migration. Scour or erosion leading to a change in elevation or drop at the structure entrance may be an issue if a stream was flowing through the structure; however, that is not anticipated given the design. As reviewed in LEC's NOI Report, interceptor trenches are proposed upgradient of the crossing structure at the adjacent northeasterly and southeasterly Limits of Work (Lots 6 and 4, respectively) to receive surface flow/runoff and redirect away from the crossing structure. Undesirable soil material within the regraded entrances will be replaced with clean sandy material to promote natural infiltration. The regraded areas on either side of the crossing structure will be revegetated with the New England Wetland Plants Roadside Upland Matrix Seed Mix or Conservation-approved similar.

### Staff Comment

- *The applicant is proposing land protection as shown on Sheet CR2 of the site plans. Some of the land protection extends upon Lot 4 which is to the west of 2 of the vernal pools. The land protections here are within 50-100 feet of the wetlands and includes some of the 100 ft. vernal pool buffer on this lot. Future development on this lot is of concern. An additional future open space parcel is shown on Lot 4, however, no permanent protections are solidified.*

### Response

The Applicant is proposing to permanently protect approximately 24.2± acres of Open Space, including 11.02± acres within the 200-foot Vernal Pool Buffer Zone, as depicted on the previously submitted *Open Space Plan* prepared by McClure Engineering, dated September 7, 2022. The Applicant has been coordinating directly with MA Division of Fisheries and Wildlife (MassWildlife) and will be providing an update at the March 30, 2023 Public Hearing.

### Staff Comment

- *A table is provided in the narrative outlining vernal pool impacts and protections. The table should also include a breakdown of wetland and upland habitat protections as the vernal pools are smaller than the wetlands and upland habitat is critical to their survival. If that breakdown is included in those calculations, then the table should be revised to state such.*

### Response

The table on page 13 of LEC's NOI Report provides a breakdown of Vernal Pool (UPLAND) Buffer Zone impacts vs. protected areas, excluding wetland areas. "Upland" has been added to the table below for clarification. The proposed 24.2± acre Open Space will also protect an additional 6.0± acres of wetlands and 7.2± acres of upland beyond 200 feet.

Vernal Pool	Total Proposed 100-200 Foot VP Buffer Disturbance (Upland SF)	Total Proposed Impervious Structure, Driveway, Road, Rain Garden, Lawn (Upland SF)	Proposed Revegetation (Upland SF)	Total VP Buffer Protected (Upland SF)
A-series Vernal Pool (South)	19,800	12,200 (9.3%)*	7,600	130,761
A-series Vernal Pool (north)	11,325	5,705 (2.5%)*	5,620	225,968
E-series Vernal Pool	11,700	8,065 (6.5%)*	3,635	123,252
<b>TOTAL</b>	<b>42,825</b>	<b>25,970 (5.4%)*</b>	<b>16,855</b>	<b>479,981 (11.02± acres)</b>

\* Proposed Impervious Structure, Driveway, Road, Rain Garden, Lawn /Total VP Buffer Protected.

Staff Comments

- *A peer review has also been conducted for compliance with the MA Stormwater Standards. It was found that the project is in compliance. Vernal pools are fragile systems. Impacts to water quality from runoff such as changes to temperature, pH, salinity and introduction of contaminants are a concern. These concerns aren't addressed by meeting the standards. There are no measures in place to control contaminants which may come from the road or from salt uses and changes in water temperature. A reduced salt program is proposed. The Regs currently prohibit salt use within 200 feet of wetlands. How much salt would this result in for this project? Are there any studies that may be available demonstrate no pH impacts with a reduced regime at vernal pools?*

Response

Per the state and local stormwater regulations Vernal Pools are considered Critical Areas. Discharge to Critical Areas is controlled as part of Standard 6 of the stormwater regulations which requires a water quality volume twice that of standard stormwater management systems. The local stormwater regulations, <https://ecode360.com/35318689>, do not require anything beyond that of the state as far as increased water quality treatment prior to discharge to Critical Areas. The project, as designed, currently exceeds the minimum water quality volumes as required by the state and local regulations. Standard 4 (water quality) and Standard 6 (discharge to critical areas) are covered in Section 3 of the Stormwater Management Report dated November 9, 2022. This report has been certified by a MA licensed professional civil engineer and peer reviewed by a third-party MA licensed professional engineer retained by the Town.

Staff Comment

- *In addition, impacts to water quantity from runoff is a concern. The proposal meets current stormwater standards as modeled, however, DEP is in the process of updating the standards. One change will be to use more current NOAA data that reflects more current weather patterns. Was the modeling done to reflect the newer data? Also, the modeling was done based on the existing conditions. It would be useful for the board for the project team to go over the modeling and stormwater design since the site has*

*poorly drained soils and the site will be excavated in some areas and filled in others. Has this been accounted for in the stormwater analysis? How do you model for this?*

Response

The stormwater analysis, model, and design are based upon the NOAA Atlas 14 Point Precipitation Frequency Estimates data which is considered the most conservative precipitation model at this time, a standard practice for McClure. All stormwater analysis, modeling, and design is based upon existing conditions as there must be a baseline for the design. The existing conditions model informs the existing peak flows to our analysis points based upon watersheds to analysis points, ground cover type, hydrologic soil type, ground slopes, drainage paths, times of concentration, etc. The proposed model is created in the same manner with the same analysis points and this data is then compared to the existing data. Fill and cut areas are accounted for by the change of ground covers, ground slopes, drainage paths, watershed breaks, times of concentration, etc. The design and model is then revised accordingly in order to minimize peak flows to analysis points which are required to be less than existing peak flows. There are eight analysis points as part of this design: Southbridge Parcel #019-048, Wetland A from flag 56-87, Wetland A from flag 47-56 which is associated with the norther A series vernal pool, Wetland A from flag 32-47, Wetland Series A from flag 23-32 which is associated with the southern A series vernal pool, Wetland Series B which is located on Berry Farms Road Lot 2, Wetland Series E and the associated vernal pool, and Southbridge Parcel 032-092. All peak flows for all storms (2, 10, 25, and 100-year storm events) are less during the post development design than in the pre-development existing conditions models which is a requirement of the state and local stormwater regulations for Standard 2. Scope of analysis, purpose, methodology, rainfall events, soil classification, and model summaries are included in Sections 1 and 2 of the previously submitted Stormwater Management Report. This report has been certified by a MA licensed professional civil engineer and peer reviewed by a third-party MA licensed professional engineer retained by the Town.

Staff Comment

- *Certified vernal pools are considered Outstanding Water Resources under the Surface Water Quality Standards. The board and staff have requested that the pools be certified with the NHESP. Has this been done to date? Certified pools receive extra protections from discharges under those standards. It should be verified if review pursuant to these standards for indirect discharges is required.*

Response

As mentioned above, the on and off-site Vernal Pools are being considered as Critical Areas for compliance with Standard 6 of the Stormwater Standards, which requires a water quality volume twice that of standard stormwater management systems. The project, as designed, currently exceeds the minimum water quality volumes as required by the state and local regulations. Standard 4 (water quality) and Standard 6 (discharge to critical areas) are covered in Section 3 of the previously submitted Stormwater Management Report dated November 9, 2022. This report has been certified by a MA licensed professional civil engineer and peer reviewed by a thirdparty MA licensed professional engineer retained by the Town.



As recommended by Oxbow in their December 23, 2022 peer review report, the Applicant has agreed to certify the northerly A-series Vernal Pool and on-site portion of the E-series Vernal Pool as a condition to an issued Order of Conditions (i.e., prior to the start of work).

Staff Comment

- *DEP originally had questions in regards to the stormwater system meeting standards and questions in regards to the test pit data? Responses provided. The project team should review this for the board. Test pits noted to have been rounded all at 36-41” and rounded to 36”. Is each test pit log recorded on a DEP Form 11 or equivalent which can be provided or has been reviewed by the peer reviewer and verified?*

Response

Soil testing locations and soil logs are provided on sheets C2-C5 of the previously submitted plan set dated November 10, 2022. The soil testing was performed by a MA licensed professional civil engineer and MassDEP certified soil evaluator and the plans/soil testing results have been peer reviewed by a third-party MA licensed professional engineer retained by the Town. Additional soil testing information was provided in a previously submitted January 25, 2023 letter prepared by McClure.

Staff Comment

- *Additional stormwater questions that the board should consider: Does the report explain how fill will be addressed or affect the system design when placed on top of? What is the depth to groundwater for structures which provide infiltration? Was mounding analysis provided for structures where the bottom will be less than 4 feet above Seasonal High Groundwater? Will monitoring wells be required?*

Response

Any stormwater BMPs designed to be infiltration BMPs cannot be constructed in ordinary fill. All fill under infiltration BMPs must be free draining materials (sand, loamy sand, crushed stone, bioretention soil media, etc.) to the native subsoil layer (top soil must be removed). BMPs which are not designed to infiltrate can be constructed in ordinary fill but any non-infiltrating BMPs proposed will be lined with impervious barriers. All infiltrating BMPs must be and are designed to have a minimum of two-foot separation to estimated seasonal high groundwater. Mounding analyses were completed for all proposed infiltrating BMPs which confirms proper function of the BMPs. These have been added to the Stormwater Report. Monitoring wells are required on all infiltration BMPs per the state stormwater standards to ensure proper function (infiltration BMPs must drain completely within 72 hours). The plans and report have been certified by a MA licensed professional civil engineer and peer reviewed by a third-party MA licensed professional engineer retained by the Town.

Staff Comment

- *A vernal pool monitoring program is proposed to assess biological community and water quality? Data will be useful but what will they do if impacts noted? The project will be permitted and board could not require changes to be made.*





Response

In association with the Vernal Pool Monitoring Program, LEC will submit annual monitoring reports to the Commission for their review. Findings can be addressed at Public Hearings. Should potential impacts be noted that can be unequivocally attributed directly to the project/development or its uses, O&M practices can be reviewed and modified as necessary to ensure the protection of the downgradient Resource Areas.

Commission Comment

During the March 9, 2023 Public Hearing, Commissioner Bishop inquired about the lot lines and Limit of Work on/proximate to Lot 54. In one location on Lot 54, the Limit of Work approaches the 25-foot Buffer Zone. This represents the closest proximity of work activities to BVW. The Applicant is proposing to revegetate the regraded side slope up to the 50-foot Buffer Zone on Lot 54 (temporary disturbance). The proposed revegetation of the regraded side slopes extends along the back portions of Lots 53-57 and behind the rain gardens on Lots 58-66, in addition to Lots 20 and 21. The slopes will be loamed and seeded with a native seed mix (e.g., New England Wetland Plants Roadside Upland Matrix Seed Mix or Conservation-approved similar) containing native grasses, wildflowers, and shrub species to facilitate the slopes revegetating into forested upland. The seed mix will be applied via hydroseed with tackifier for slope stabilization. Biodegradable erosion control blankets or similar stability measures may be installed, if necessary, to supplement erosion control barriers. All barriers will be maintained throughout construction and until the slopes are fully stable and vegetated.

Thank you for consideration of this supplemental information. Please do not hesitate to contact me if you have any questions in advance of the March 30, 2023 Public Hearing.

Sincerely,

**LEC Environmental Consultants, Inc.**

Brian T. Madden

Senior Wildlife/Wetland Scientist