



October 13, 2020

Attn: Mr. David Miller  
Winchester Conservation Commission  
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**RE: The Vale  
Former Kraft Atlantic Gelatin Facility  
Hill Street, Woburn  
Natural Resources Assessment Report**

Members of the Conservation Commission:

BSC Group, Inc. (BSC) is pleased to submit this natural resources assessment relative to the review of a Notice of Intent (NOI #1) dated 4/15/2020 and an Application for Permit/Determination Woburn Wetlands Ordinance (Woburn Wetlands Application) for an approximately 60-acre property located at the site of the former Kraft Atlantic Gelatin Facility (Kraft Plant) off of Hill Street, Woburn, and an associated NOI (NOI #2) dated 4/30/2020 for activities proposed on approximately 15.6 acres the southwest section of the NOI #1 Project Site and an associated Woburn Wetlands Application. Activities proposed under these two NOIs are identified on site plans (Site Plans) titled:

1. **NOI #1:** “The Vale Master Plan Development, 1 Hill Street, Woburn, MA”, dated 04/16/2019, prepared for Montvale Land, LLC (c/o Leggat McCall Properties LLC) by Stantec (Wetlands Consultant: Vanesse Hangen Brustlin (VHB); Surveyor: Allen & Major Associates, Inc.; Geotechnical Engineer: Haley & Aldrich) (**Site Plans #1**)
2. **NOI #2:** “Site Plan for Highland at Vale” dated 4/30/2020, prepared by Civil Design Group, LLC for Pulte Homes (**Site Plans #2**)

An additional plan set has also been provided, and is titled, “The Delaney at the Vale”, dated 5/1/2020, prepared by Dimella Shaffer Associates, Inc. for LCS Woburn, LLC. (**Site Plans #3**)

With regard to NOI #1, Chad Reynolds of Montvale Land LLC c/o Leggat McCall Properties LLC is the Applicant, and Montvale Land LLC is the property owner. Laura Laich of VHB is the Applicant’s representative. With regard to NOI #2, Mark Mastroianni of Pulte Homes of New England, LLC is the Applicant, and Chad Reynolds of Montvale Land LLC c/o Leggat McCall Properties LLC is the property owner. Mathew Leidner of Civil Design Group, LLC is the

Engineers  
Environmental Scientists  
Custom Software Developers  
Landscape Architects  
Planners  
Surveyors



Applicant's representative. NOI #2 proposes a sub-division housing development within the southwest portion of the Project Site identified in NOI #1.

In addition to reviewing the above-mentioned materials, BSC has reviewed the Horsley Witten Group (HWG) initial peer review letter dated 9/21/2020, provided by HWG to the Woburn Conservation Commission, and MassDEP comments.

This letter report evaluates, and provides comments on, the project NOIs, the Woburn Wetlands Applications and Site Plans in order to evaluate the project for compliance with the Massachusetts Wetlands Protection Act (M.G.L. c. 131, s. 40) (WPA) and associated regulations (310 CMR 10.00 et al.); the Woburn Wetlands Protection and Conservation Ordinance (Title 7) (Ordinance); the associated Rules and Regulations for the Administration of the Woburn Wetlands Ordinance (Regulations); and the Woburn Conservation Commission Policies (Policies). An Order of Resource Area Delineation (ORAD) for the project site was issued on 11/22/2019, establishing wetland resource area boundaries. BSC has not reviewed the onsite wetland boundaries, and only provides comments on the ORAD itself.

BSC has also prepared a natural resources and soil loss assessment of upland areas outside of wetland resource areas and associated Buffer Zones on the Project Site. These areas are not regulated under state or local wetland regulations but do provide important ecosystem services. BSC offers this assessment as additional information for consideration as the project is evaluated by the Woburn and Winchester communities.

BSC Senior Ecological Scientist (Gillian Davies) and Wildlife and Endangered Species Specialist (Sarah Barnum) viewed the Project Site on 9/11/2020. BSC was accompanied by David Miller (Winchester Conservation Commission). BSC and Mr. Miller walked on the MWRA right-of-way to view the Project Site and any wetland resources, 100-foot Buffer Zones, and upgradient upland areas that were visible from the right-of-way. BSC recorded species observed and took photographs. BSC also viewed the project site from parking lots located west of the project site and on the opposite side of the Aberjona River.

In addition to direct observation during the site walk, BSC conducted a desktop assessment. The desktop assessment included preparation and review of the attached USGS topographic map, FEMA floodplain mapping, an Environmental Constraints map, NRCS soils mapping, National Land Cover Database mapping, as well as review of aerial imagery from Google Earth and the topography details represented on the Project Site Plans for NOI #1 and NOI #2. Google Earth imagery was also used to provide information and detail about conditions of the surrounding landscape. Over 20 images of the area from 1995 through 2019 are available on Google Earth and include all seasons, leaf-on and leaf-off images, and images with snow cover. These images provide a reasonable basis for making assumptions about the conditions of the parcel that could not be directly observed.



As part of this natural resources assessment, Dr. Richard Birdsey of the Woodwell Climate Research Center (WCRC) has prepared a greenhouse gas inventory report for forests and trees on the Project Site. This greenhouse gas inventory is intended to give an approximate estimate of:

- the existing above-ground carbon stocks in forests and trees on the Project Site;
- the existing capacity of land with forests and trees on the Project Site to sequester carbon from the atmosphere into biomass and soil;
- the loss of carbon stocks if the proposed Project is constructed; and
- the loss of future capacity for the Project Site to sequester carbon from the atmosphere into biomass and soil.

The peer review provided by BSC and Woodwell Climate Research Center is provided by a senior ecological scientist (Gillian Davies), a wildlife and endangered species specialist (Sarah Barnum), a professional engineer (Dominic Rinaldi) and a forest ecologist (Dr. Richard Birdsey). This peer review does not include review of general engineering practices, hydraulic or hydrological evaluations, or stormwater management, or review by a Licensed Site Professional, and thus does not encompass review of engineering practices and design, hydraulic and hydrological evaluations, stormwater management, or site remediation plans or methods. BSC's engineering peer review is limited to evaluating the proposed soil loss on the site due to proposed significant grade changes.

The NOIs and Site Plans identify Inland Bank (Bank), Bordering Vegetated Wetlands (BVW), Bordering Land Subject to Flooding (BLSF), Land Under Waterways (LUWW), Riverfront Area (RA), and state and locally regulated Buffer Zones as occurring on the project property. The Woburn Ordinance Regulations regulate a 150-foot Buffer Zone and establish a 25-foot No-Disturb Zone, in addition to the state-regulated 100-foot Buffer Zone.

Besides evaluating the Project documents and plan as noted above, this report provides suggestions for offsetting Project-related impacts to other natural resources located outside of regulated wetland resource areas and associated Buffer Zones. Given that these upland areas outside of Buffer Zones are not regulated as wetland resource areas or associated Buffer Zones, proposed ideas for offsetting Project-related impacts are offered as suggestions.



## **ORAD**

In reviewing the 11/22/2019 ORAD for the Project Site, BSC notes that page 2 includes the following statement, “Portions of Wetland G exhibit Vernal Pool characteristics. No finding is made herein about the presence or absence of a vernal pool.” BSC offers the following comments:

**Comment #1:** BSC recommends that the vernal pool status of Wetland G be clarified. BSC notes that NOI #1 does not include a discussion of Wetland G, and recommends that the Applicant provide this information.

**Comment #2:** NOI #1 text discussion of wetlands on the Project site also does not include discussion of Wetlands E, H, I, K, L, N, and O, and ends with P. Could the Applicant confirm that no wetlands with these identifiers occur within the Project Site, or provide relevant and required information?

## **LAND REGULATED BY STATE AND LOCAL WETLANDS PROTECTION REGULATIONS**

BSC has evaluated the proposed project with regard to how the project will impact the ability of the wetland resource areas on the project site to protect the Interests of the Wetlands Protection Act (Interests), and the role that existing Buffer Zones play in protecting the functioning of the adjacent BVW, Bank, LUWW and LSTF and their capacity to provide the ecosystem services identified as Interests of the WPA. BSC provides the following comments and discussion.

BSC notes that **NOI #2** proposes impacts only to Buffer Zone associated with BVW and Bank. These impacts are discussed below in the section titled Buffer Zone. **NOI #1**, the “master NOI” for the overall Project Site, proposes the following impacts and associated mitigation for the following wetland resource areas and associated Buffer Zones.

**Comment #3:** BSC concurs with MassDEP that both temporary and permanent impacts should be included on the NOI Form 3, and that restoration quantifications should also be reported on the NOI form.

## **INLAND BANK**

NOI #1 identifies 1,423 linear feet of Bank impacts and proposes 1,633 linear feet of stream restoration associated with Sweetwater Brook. BSC notes that the Applicant has provided the required Wildlife Habitat Assessment in Attachment F, and that no important wildlife habitat features were identified in the assessment. The NOI reports that VHB has completed a “no rise” analysis documenting that, “there is no-rise upstream and downstream during at the 1% annual event (i.e. 100-year) in the proposed conditions”. The proposed conditions are reported to “...result in a reduction in flooding for the 1% annual event in Woburn, Stoneham and Winchester” with the exception of an approximately 0.2-foot rise that is “...contained within the



limits of the existing [two 48 inch culverts] culvert” on the project site at the downstream section of Sweetwater Brook.

Bank impacts are associated with the proposed stream restoration that includes daylighting of culverted sections of the Brook, naturalizing channel sections, adding meanders, a natural bottom and pool riffle structure to the channel, removing existing structures including the sluice gate and associated concrete steps, retaining walls, concrete piers, two culverts, footbridge, roadway bridge with sluiceway and weir. Two new bridges are proposed to be constructed. The Applicant states that they will meet and exceed the Massachusetts Stream Crossing Standards (see page 11 and Attachment E). Table 1 (Attachment E, page 8) is provided to document how the two stream crossings meet and exceed both the general and optimal Stream Crossing standards.

**Comment #4:** BSC notes that review of engineering-related information pertaining to proposed impacts and restoration of Bank is recommended, and that HWG has provided such a review in a letter dated 9/21/2020.

**Comment #5:** BSC notes that the construction sequence listed on NOI #1 page 11 does not appear to reference stream restoration activities (including BVW restoration within Sweetwater Brook). BSC recommends that this be included/clarified.

**Comment #6:** BSC notes that although Wetland P is referenced as being located in a former constructed ditch, and now contains an intermittent stream, NOI impact and mitigation text and Tables 3 and 4 on page 13 do not indicate that Bank associated with the intermittent stream has been assessed and quantified as an impact, or factored in to mitigation planning. BSC recommends that this information be provided.

**Comment #7:** BSC recommends that additional consideration be given to inclusion of wildlife habitat features in the plans for Sweetwater Brook restoration, and that Bank plantings include saplings and shrubs that will provide shade.

**Comment #8:** BSC concurs with MassDEP that additional detail regarding the stream crossings, and how they meet the Massachusetts Stream Crossing Standards should be provided, and with HWG’s requests for additional information in their Sweetwater Brook restoration discussion in their letter dated 9/21/2020.

**Comment #9:** BSC concurs with MassDEP that additional detail and information regarding how Bank will be constructed during the daylighting of Sweetwater Brook should be provided, as well as documentation showing a low flow channel and information on how bankful width was determined.

**Comment #10:** BSC concurs with MassDEP that additional information regarding dredging of Sweetwater Brook should be provided, such as specifications indicating width and depth of dredging.



**Comment #11:** BSC notes that MassDEP recommends that the daylighting of Sweetwater Brook be filed as an Ecological Restoration Limited Project under 310 CMR 10.53(4). BSC recommends that the Applicant provide additional information in this regard.

**Comment #12:** BSC concurs with HWG Comments #2 and #3 on page 13 of their 9/21/2020 letter that suggest extending the Sweetwater Brook stream restoration upstream to the Project Site boundary and downstream to the confluence with the Aberjona River, and asking for additional information in this regard.

**Comment #13:** BSC notes that in general, the proposed restoration of Sweetwater Brook is likely to improve conditions significantly relative to current conditions.

## **BVW**

Wetlands C and P, located on the northeast edge of the project site in proximity to I-93 (see Site Plans #1 Sheet L-202), are proposed be filled to accommodate a proposed building and access roadway, resulting in a total of approximately 1,691 s.f. of permanent fill, according to NOI #1. These wetlands are reported to have formed in segments of former constructed ditches and are scrub-shrub dominated with some seasonal ponding (Wetland C) and a wet meadow bordering an intermittent stream (Wetland P). To mitigate for these impacts, the Applicant proposes greater than 2:1 areal replacement of BVW, for a total of 5,250 s.f. of replicated wetland, which is proposed to be located adjacent to existing Wetland F. A 2:1 areal replacement would have resulted in 3,382 s.f. of replacement. The proposed replacement is slightly more than a 3.1:1 ratio, which exceeds state and local regulatory requirements for aerial replication.

Construction of the replication area is proposed to be conducted in conjunction with the proposed cleanup of contaminants in Wetland F, the site of a former industrial lagoon. NOI #1 (page 11) indicates that in addition to the BVW replication area, 14,615 s.f. of Wetland F will be remediated and restored. Wetland F is an emergent wetland with a scrub-shrub fringe that is contaminated as a result of former industrial activities. Additionally, as part of the Sweetwater Brook restoration, approximately 1,574 s.f. of BVW associated with Wetland A will be temporarily impacted and restored (page 14). NOI #1 identifies Wetland A as being predominantly vegetated by herbaceous species. NOI #1 provides specific information on each of the Project wetlands (pages 5 – 8), although as noted above, no discussion of Wetlands G, E, H, I, K, L, N, and O is provided. NOI #1 provides wetland replication and restoration plans (pages 14, 21 – 27 and Site Plans #1 Sheets L-701 and C-808). In reviewing this information, BSC provides the following comments:

**Comment #14:** BSC recommends that the Applicant provide clear labelling of each existing wetland on Site Plans.



**Comment #15:** BSC concurs with MassDEP that the Applicant should demonstrate compliance with BVW performance standards at 310 CMR 10.55(4) by providing an alternatives analysis for proposed impacts to Wetlands C and P, documenting maximization of avoidance of impacts followed by minimization of impacts, and specifically including consideration of a reduction of building size and roadway width, or realignment of the development footprint.

**Comment #16:** NOI #1 (page 33) states, “A comprehensive alternatives analysis was completed as part of the MEPA process for the Project, as described above in the Impacts to BVW section.” BSC recommends that the Applicant provide the MEPA comprehensive alternatives analysis to the Woburn Conservation Commission. BSC notes that the Applicant has provided an alternatives analysis with regard to remediation methodology in NOI #1, but not with regard to site design alternatives to avoid and minimize impacts and not with regard to wetland mitigation alternatives.

**Comment #17:** BSC notes that the proposed location of the wetland replication area is not in the immediate area of the proposed impacts to Wetlands C and P. BSC recommends that the Applicant address the BVW performance standards that require:

“The ground water and surface elevation of the replacement area shall be approximately equal to that of the lost area” (310 CMR 10.55(4)(b)2

“The overall horizontal configuration and location of the replacement area with respect to the bank shall be similar to that of the lost area” (310 CMR 10.55(4)(b)3

“The replacement area shall have an unrestricted hydraulic connection to the same water body or waterway associated with the lost area” (310 CMR 10.55(4)(b)4

“The replacement area shall have an unrestricted hydraulic connection to the same water body or waterway as the lost area” (310 CMR 10.55(4)(b)5

**Comment #18:** BSC recommends that the Applicant revise the Wetland Replication Plan elevations (Sheet L-701) to indicate the varied microtopography referenced in Note #5 on Sheet L-701, rather than indicating a flat surface in the wetland replication area. BSC also notes an area of upland proposed to be located between the wetland replication area and the wetland restoration area. BSC recommends that the Applicant provide discussion regarding the purpose of this area.

**Comment 19:** On the Wetland Replication Plan (Sheet L-701), the wetland replication Notes reference shrub plantings and woody plantings, but no shrub planting table is provided on the sheet. BSC recommends that a shrub planting table be provided. NOI #1 page 21 provides a discussion of the proposed wetland replication area, and references both Wetland C and P as being wet meadow communities, whereas Wetland C is described as having a scrub-shrub community on page 6, and Photo # 17 on page 9 of the Photo Log shows scrub-shrub vegetation. The text for wetland replication beginning on page 21 only includes herbaceous species. BSC recommends that native shrub plantings be added to Table 6 on page 22, and to the wetland replication text discussion. BSC suggests that the Applicant clarify the planting plan for Wetland F following remediation, including numbers of plants, and recommends the inclusion of shrubs and replication of conditions in the area being restored.



**Comment #20:** BSC recommends that the Applicant provide additional information regarding how the proposed approach to restoration of Wetland A will address successful conversion of existing invasive species cover to native species cover, given the proposal to remove just 12 inches of soil, and the specific invasive species that are present (which have extensive rhizome and rooting systems). BSC notes that the Invasive Plant Species Control Plan (Attachment G, page 7) indicates that invasive species monitoring will only continue after construction for two years. Given the reported extent of invasive species, it is likely that a longer monitoring program will be necessary to effectively ensure that conversion to native species is successful. BSC recommends that the Applicant provide a longer monitoring and treatment timeframe.

**Comment #21:** BSC recommends that the Applicant specify the qualifications (minimum years of experience, certification status, etc.) of the wetland scientist who will oversee wetland replication activities, and specify that the overseeing wetland scientist will be present each day for the complete workday while wetland replication construction and planting are occurring.

**Comment #22:** BSC recommends that the Applicant provide specifications for the “good quality topsoil” (see page 26) and “prepared topsoil” (see Site Plans #1 Sheet L-701) that will be used to create wetland soils for the wetland replication area. The source of the topsoil and standards for avoidance of contamination, debris, and non-soil components should be specified. A maximum percentage of large fraction material should be identified.

**Comment #23:** BSC recommends that if there is a need to make substitutions for plant species, that the Woburn Conservation Commission review and approve proposed substitutions.

**Comment #24:** BSC recommends that the Applicant provide a watering plan for the first growing season following planting.

**Comment #25:** BSC notes that Table 3 on page 13 does not appear to include the 5,250 s.f. of wetland replication to be constructed on the edge of Wetland F and recommends that this be included. BSC also notes that page 16 includes a reference to a total of approximately 21,420 s.f. of “remediation area” including 14,615 s.f. at Wetland F. If the 5,250 s.f. of replicated wetland is added, the total is 19,865. Please clarify the discrepancy.

Additionally, as part of the Sweetwater Brook restoration, approximately 1,574 s.f. of BVW is proposed to be restored within Sweetwater Brook (see page 14-15 and Site Plans #1, Sheet C-808). In reviewing this information, BSC provides the following comments:

**Comment #26:** BSC recommends that the Applicant specify the qualifications (minimum years of experience, certification status, etc.) of the wetland scientist who will oversee wetland restoration activities, and specify that the overseeing wetland scientist will be present each day for the complete workday while wetland restoration construction and planting are occurring.



**Comment #27:** BSC recommends that the Applicant provide additional specifications for “prepared soils” (see Site Plans #1 Sheet C-808) that will be used to create wetland soils for the wetland restoration area. The source of the topsoil and standards for avoidance of contamination, debris, and non-soil components should be specified. A maximum percentage of large fraction material should be identified.

**Comment #28:** BSC recommends that if there is a need to make substitutions for plant species, that the Woburn Conservation Commission review and approve proposed substitutions.

**Comment #29:** BSC recommends that shrubs of the same species be planted in clusters of 4 – 5, to replicate natural patterns and increase likelihood of successful growth and pollination.

**Comment #30:** BSC recommends that the Applicant provide a watering plan for the first growing season following planting.

Proposed remediation and restoration activities within Wetland F and Sweetwater Brook exceed the BVW performance standard limit listed at 310 CMR 10.55(4) that does not allow impacts to exceed 5,000 s.f. On page 33 of NOI #1, the Applicant identifies this work as being eligible for Limited Project status in accordance with 310 CMR 10.53(3)(q), which allows greater than 5,000 s.f. of impacts to wetland resource areas as a result of oil and/or hazardous material mitigation and remediation. BSC concurs with this statement of eligibility but notes that MassDEP recommended that the Applicant propose the daylighting of Sweetwater Brook as an Ecological Restoration Limited Project (310 CMR 10.13(4)).

**Comment #31:** BSC recommends that the Applicant provide additional information in this regard, and that the Applicant provide the alternatives analysis that is required for the granting of Limited Projects.

## **LUWW**

As part of the Sweetwater Brook restoration, approximately 15,444 s.f. of LUWW are proposed to be impacted by dredging and construction of additional sinuosity in the Brook channel (see page 17 and Site Plans #1 Sheets C-802 through C-804). The Applicant anticipates that over 100 cubic yards of material would be dredged and removed and that approximately 3,608 s.f. of new LUWW will be created as a result of channel widening. The Applicant proposes this restoration plan, in addition to daylighting and removal of structures, fill and materials from the Brook to enhance stream function and fish and wildlife habitat value.

**Comment #32:** BSC notes that review of engineering-related information pertaining to proposed impacts and restoration of LUWW is recommended, and that HWG has provided such a review.



**Comment #33:** BSC notes that MassDEP recommends that the daylighting of Sweetwater Brook be filed as an Ecological Restoration Limited Project under 310 CMR 10.53(4). BSC recommends that the Applicant provide additional information in this regard.

## **BLSF**

The Applicant proposes regrading approximately 1.9 acres of BLSF and notes that much of this area is currently paved or developed. Approximately 10,638 cubic feet of fill is proposed to be placed within BLSF to support construction of the access roadway and Garage 1 (north of Sweetwater Brook). The Applicant has conducted a hydraulic assessment, including a no-rise analysis, which they report confirmed that proposed development, “will not exacerbate downstream or upstream flooding” (see page 18). NOI #1 states that compensatory flood storage is proposed at each elevation where filling is proposed such that there will be, “no net loss of one (1) percent annual exceedance event (i.e. 100-year) flood storage capacity”. Sheet L-301 shows the location of compensatory flood storage areas (north side of Sweetwater Brook).

**Comment #34:** BSC notes that review of engineering-related information pertaining to proposed impacts and restoration of BLSF is recommended, and that HWG has provided such a review.

**Comment #35:** BSC recommends that plantings proposed for the compensatory flood storage areas be native species and varieties (see Sheet L-501), and that some microtopographic variability be introduced to the bottom of the compensatory flood storage area to mimic natural systems and provide habitat variability (while maintaining the required compensatory flood storage volume).

**Comment #36:** BSC recommends that the Applicant provide specifications for soil to be used in the compensatory flood storage area, as well as a construction sequence, watering plan, invasive species management plan, and monitoring plan. The Applicant could clarify that the Invasive Plant Species Control Plan provided in Attachment G applies to the compensatory flood storage area as well as to wetland mitigation and restoration areas.

**Comment #37:** BSC concurs with MassDEP’s recommendation that compensatory flood storage areas should be stabilized with natural soft solutions rather than with riprap.

## **RIVERFRONT AREA**

Project activities, including construction of some of the proposed buildings, access roads and associated retaining walls and remediation of Wetland F, are proposed to occur on approximately 8.8 acres of previously developed RA. NOI #1 text states that impacts would occur only to previously disturbed and degraded Riverfront Area. In the vicinity of the proposed new bridge at



Crossing 1, approximately 10,616 s.f. of degraded RA will be impacted by placement of paved surfaces.

The Applicant intends to create a net improvement to the RA by removing approximately 1.5 acres of impervious area, by improving drainage and stormwater management, by daylighting and restoring Sweetwater Brook, and by restoring and naturalizing approximately 1-acre (46,358 s.f.) of the inner 100-foot RA with “native plantings and landscaping” to “restore key wetlands and wildlife functions to this area” (see pages 18-19 and Site Plan #1 Sheet L-501). BSC provides the following comments:

**Comment #38:** The Applicant states that approximately 1.5 acres of impervious area will be removed, and that approximately 1.0 acre of RA will be restored with native plantings. Could the Applicant specify the treatment of the remaining approximately 0.5 acre of land where impervious cover is intended to be removed? If feasible, BSC recommends that the remaining approximately 0.5 acres be restored with native plantings as well, and that the Applicant confirm that planting in the RA will restore a natural, rather than landscaped, riparian ecosystem, with native species and excluding cultivars.

**Comment #39:** BSC suggests that the Applicant confirm that activities proposed in the RA will not occur within non-degraded RA. A simplified plan showing the footprint of proposed work superimposed over the footprint of existing degraded RA would be helpful in this regard.

**Comment #40:** BSC recommends that the Applicant provide specifications for soil to be used in RA restoration, as well as a construction sequence, watering plan, invasive species management plan, and monitoring plan. The Applicant could clarify that the Invasive Plant Species Control Plan provided in Attachment G applies to upland areas within RA as well as to wetland mitigation and restoration areas.

**Comment #41:** BSC recommends that the Applicant provide the qualifications of the person who will be overseeing the RA restoration.

**Comment #42:** BSC concurs with the Applicant (see pages 39-40) that performance standards for RA will be met, particularly once requested additional information has been provided. Given the net loss of impervious cover, the restoration of Sweetwater Brook and associated RA, and the improved drainage and stormwater management, BSC concurs that a net improvement to RA will result from project implementation.



## **BUFFER ZONE**

### **Regulatory Framework and Performance Standards**

The MA WPA regulations (310 CMR 10.02(2)(b)) requires review of activities proposed within 100 feet of Bank and BVW. The MA WPA regulations (**310 CMR 10.03(1)(a)**) place the burden of proof on the Applicant, stating:

Any person who files a Notice of Intent to perform any work within an Area Subject to Protection under M.G.L. c. 131, section 40 **or within the Buffer Zone** has the burden of demonstrating to the issuing authority:

1. That the area is not significant to the protection of any of the interests identified in M.G.L., c. 131, section 40: or
2. That the proposed work within a resource area will contribute to the protection of the interests identified in M.G.L. c. 131, section 40 by complying with the general performance standards established by 310 CMR 10.00 for that area.

The Woburn Wetlands Ordinance has a similar burden of proof requirement (Ordinance Section 7-12) and requires review of activities within 150 feet of these regulated resource areas (Section 7-2). Additionally, Woburn Wetland Policy #6 establishes a 25-foot No Build Zone. The following discussion assesses the project in the context of these regulations as well as current Buffer Zone science. For the purposes of this letter, the term “Buffer Zone” refers to all regulated Buffer Zones (25-foot, 100-foot and 150-foot), unless specified in a more particular way.

The WPA regulations (310 CMR 10.54(1) and 10.55(1)) presume that Bank and BVW are significant to the following Interests:

- Public or private water supply
- Groundwater supply
- Flood control
- Storm damage prevention
- Prevention of pollution
- Protection of fisheries
- Wildlife habitat

The Woburn Wetlands Ordinance Section 7-1 protects additional Interests identified as erosion and sedimentation control, recreation agriculture, aquaculture, and historic values.

### **Woburn Wetlands Ordinance 25-foot No Disturb Zone**

BSC notes that in NOI #1 the Applicant has requested exemption from the 25-foot No Disturb Zone Ordinance requirement and provides justification based on the existing heavily disturbed nature of the area to be impacted, the limiting of impacts within this area to those associated with the two proposed bridges and activities associated with mitigation and restoration of regulated



wetland resource areas and their Buffer Zones, and activities associated with the filling of Wetlands C and P. With regard to Wetlands C and P, please see earlier comments in the BVW section. BSC notes that much of the Buffer Zone for these two wetlands within the Project Site appears to be developed already, as is much of the Buffer Zone for the wetlands associated with the two proposed crossings. Proposed activities in the Buffer Zone for the two crossings includes restoration as well as development.

**Comment #43:** With regard to the 25-foot No Disturb Zone, BSC recommends that the Applicant provide additional information as outlined throughout this comment letter, including an alternatives analysis, so that the Woburn Conservation Commission can make a determination based on more complete information.

**Comment #44:** BSC notes that one of the requirements for a waiver under the Ordinance is that the action proposed be in the public interest, and that the actions be consistent with the intent and purpose of the Ordinance. BSC recommends that the Applicant provide documentation that these requirements have been met. In addition to full compliance with wetland resource area performance standards, BSC recommends that minimization of the loss of natural vegetation, trees and forestland on the overall site and mitigation for loss of carbon stored in trees and forestland be included in demonstrating that public interest and intent and purpose of the Ordinance are well served, particularly as indicated by Woburn Wetlands Ordinance Section II.2.h and k.

### **BVW, Bank and Buffer Zone**

**Comment #45:** As noted elsewhere, provision of a table with quantification of Buffer Zone impacts broken out by type of Buffer Zone and type of impact would be helpful in assessing proposed impacts, as would additional plan details and text.

At **310 CMR 10.53(1)** WPA regulations state:

For work in the Buffer Zone subject to review under 310 CMR 10.02(b)3. [i.e. work that does not qualify for the minor activities provisions listed at 310 CMR 10.02(b)1. and 2.], the Issuing Authority shall impose conditions to protect the interests of the Act identified for the adjacent Resource Area. The potential for adverse impacts to Resource Areas from work in the Buffer Zone may increase with the extent of the work and the proximity to the resource Area. The Issuing Authority may consider the characteristics of the Buffer Zone, such as the presence of steep slopes, that may increase the potential for adverse impacts on Resource Areas. Conditions may include limitations on the scope and location of work in the Buffer Zone as necessary to avoid alteration of Resource Areas. The issuing Authority may require...the preservation of natural vegetation adjacent to the Resource Area and/or other measures commensurate with the scope and location of the work within the Buffer Zone to protect the interests of M.G.L. c. 131, section 40...The



purpose of preconstruction review of work in the Buffer Zone is to ensure that adjacent Resource Areas are not adversely affected during or after completion of work.

These provisions direct the Conservation Commission to determine whether a proposed activity in the Buffer Zone will alter Bank or BVW, and to impose conditions necessary to protect the Interests of the Act for which the resource area(s) is/are presumed significant, as well as to comply with performance standards associated with the adjacent resource area(s). WPA regulations at 310 CMR 10.53(1) specify the factors that the Conservation Commission may consider when evaluating proposed activities and their potential for adversely impacting regulated resource areas.

### **Alternatives Analysis**

The WPA regulations (310 CMR 10.55(4)(b)) pertaining to the evaluation of potential impacts to BVW require that:

...the issuing authority shall consider the magnitude of the alteration and the significance of the project site to the interests identified in M.G.L. c. 131, s. 40, the extent to which adverse impacts can be avoided, the extent to which adverse impacts are minimized, and the extent to which mitigation measures, including replication or restoration, are provided to contribute to the protection of the interests identified in M.G.L. c. 131, s 40.

Given these regulatory requirements and the proposed proximity of proposed work to the BVW boundary in both NOI #1 and NOI #2, as well as the total area of Buffer Zone impacts proposed, BSC provides the following comments.

**Comment #46:** BSC recommends that the Applicants provide an alternatives analysis to demonstrate that they have sequentially

- 1) ***maximized avoidance of impacts*** to BVW and Bank and the Interests of the WPA to the greatest extent possible, which would include consideration of alternatives that provide a naturally vegetated Buffer Zone of sufficient width to contribute to the protection of the BVW and Bank Interests of the Act;
- 2) ***minimized impacts*** to the greatest extent possible, including Buffer Zone impacts where impacts to Buffer Zone reduce the capacity of the BVW and Bank to contribute to the Interests of the WPA; and finally
- 3) ***provided appropriate mitigation*** for Buffer Zone impacts that cannot be avoided or minimized (as relevant to the BVW/Bank Interests of the Act; see Buffer Zone Science section).

**Comment #47:** Of note, with regard to NOI #2, BSC notes that given the size of the property, it is likely that a housing development could be constructed with significantly reduced impacts to the Buffer Zone compared to the current proposal, and recommends that the Applicant include such a scenario in the alternatives analysis.



**Comment #48:** BSC recommends that the alternatives analysis include (but not be limited to) the following:

- Demonstration that avoidance of impacts to the Buffer Zone has been maximized in order to avoid impacts to the adjacent wetland resource areas and the Interests of the WPA.
- Following efforts to avoid impacts, demonstration that impacts to the Buffer Zone and associated wetland resource areas have been minimized.
- Confirmation that impervious surfaces have been minimized to the greatest extent possible, such as removal of buildings, decks and roads/parking from the Buffer Zone.
- Retention of undisturbed forest cover throughout as much of the Buffer Zone as possible, but at a minimum, retention of undisturbed forest cover in widths consistent with recommendations for each of the BVW and Bank Interests of the Act found in scientific literature including as discussed in the MACC Wetlands Buffer Zone Guidebook (Guidebook 2019), and as discussed below.
- Documentation that each proposed alternative does not cause deterioration of the functions and values (Interests) of BVW and Bank adjacent to areas where Buffer Zone is to be impacted, and loss of the buffering capacity of Buffer Zones where impacts are proposed, and that the alternative contributes to the Interests of the WPA and the Ordinance. BSC recommends that the existing buffering capacity of the Buffer Zone be evaluated for each of the Interests presumed significant to BVW and Bank, and then compared to anticipated buffering capacity of the Buffer Zone during and after the construction period for each alternative identified in the alternatives analysis.

**Comment #49:** BSC notes that Buffer Zone impacts have not been quantified, and suggests that the Applicants provide a table that includes Buffer Zone impacts by type and condition of existing Buffer Zone such as:

<b>Buffer Zone Type and Condition</b>	<b>Permanent Impact (s.f.)</b>	<b>Temporary Impact (s.f.)</b>	<b>Type of Impact (impervious, structure, pervious, ecological restoration, etc.)</b>
25-Foot Naturally Vegetated			
25-Foot Developed Pervious			
25-Foot Impervious			
100-Foot Naturally Vegetated			
100-Foot Developed Pervious			
100-Foot Impervious			



150-Foot Naturally Vegetated			
150-Foot Developed Pervious			
150-Foot Impervious			

**Comment #50:** BSC recommends that plans be provided to the Woburn Conservation Commission that show the Buffer Zone lines superimposed on proposed development, and that existing conditions, including topographic contours, be clearly visible beneath the proposed development. Site Plans #1 show proposed buildings in solid fill that does not allow comparison to existing conditions or Buffer Zone limits within the proposed building footprint. BSC notes that the Woburn Ordinance Rules and Regulations require site plans to include existing and proposed contours (Section V.C.1).

**Comment #51:** BSC notes that significant grade changes are proposed within the Buffer Zones, and that proposed slopes will be steep in numerous locations, including immediately upgradient from the wetland replication and Wetland F remediation/restoration area. Slope is a significant factor in establishing effective Buffer Zone widths between development and wetland resource areas (see discussion below). BSC recommends that the Applicants provide documentation that proposed development is located such that effective Buffer Zone widths have been established, and that the Buffer Zone widths are consistent with widths supported by research, and that proposed slopes have been factored in to determining the Buffer Zone widths. The MACC Wetlands Buffer Zone Guidebook (2019) provides references in this regard. BSC notes that the effectiveness of Buffer Zone widths differs, depending on which Interest of the WPA is being protected. BSC recommends that the Applicants document that an effective Buffer Zone width has been established for each of the Interests presumed to be significant to the downgradient wetland resource area(s), or document that the presumption(s) of significance has been overcome.

**Comment #52:** The Applicants propose work within much of the naturally vegetated Buffer Zones onsite, thus eliminating much Buffer Zone capacity to buffer the adjacent wetland resource areas from impacts associated with the proposed development. In general, scientific literature (Guidebook, 2019) indicates that activities that are closer to a wetland resource area are likely to have greater impact than the same activities if they were located farther from the resource area, and that activities on slopes are likely to have greater impact than activities on flat or low gradient land. As an example, the Environmental Law Institute's *Planner's Guide to Wetland Buffers for Local Governments* (2008) states that buffers of less than 50 feet were susceptible to degradation by human disturbance, and that buffers of less than 25 feet do not function to reduce disturbance to the adjacent wetland. Loss of the much of the remaining naturally vegetated Buffer Zone on this project site should therefore be expected to result in alteration of the wetland characteristics that provide important functions and values associated with the BVW Interests of the WPA, and therefore is anticipated to result in adverse impacts to the adjacent BVW and Bank. BSC notes



that activities in all portions of the state-regulated 100-foot Buffer Zone are reviewed under the same WPA regulations.

**Comment #53:** BSC recommends that the Applicants provide documentation of how proposed development of the Buffer Zone contributes to the Interests of the WPA.

**Comment #54:** BSC notes that the proposed Limit of Work (as identified by the erosion and sedimentation control line) is shown on various Site Plans (both #1 and #2) as touching or overlapping the 25-foot Buffer Zone line in several locations. Steep grading is proposed immediately upgradient of the erosion and sedimentation control line, and immediately upgradient of wetland restoration and mitigation areas and stream restoration areas. Where the Limit of Work is touching or overlapping the 25-foot Buffer Zone, BSC notes that it is unlikely that inadvertent construction phase impacts will not occur within the 25-foot Buffer Zone, particularly given that topography slopes upward from these boundaries in many locations.

**Comment #55:** BSC recommends that the Limit of Work boundary be moved upgradient to avoid unpermitted construction phase impacts within the 25-foot Buffer Zone, and to provide sufficient Buffer Zone to ensure that the proposed project contributes to the Interests of the Act (see further discussions).

Due to the close proximity of proposed work (including grading activities) to the 25-foot Buffer Zone, and in the case of NOI #1 proposed work within the 25-foot Buffer Zone, BVW, Bank, and LUWW, and proposed steep grades, and based on Buffer Zone research (Guidebook, 2019) BSC anticipates that the proposed activities as currently indicated on Site Plans would have a significant impact on the capacity of the existing naturally vegetated Buffer Zone to protect the adjacent BVW and Bank and affiliated Interests of the WPA. BSC notes that the proposed development would break up a relatively large area of contiguous forest cover on the southern and western portions of the Project Site.

**Comment #56:** BSC recommends that the Applicants provide information on the impacts associated with the proposed layouts, and other alternatives, on the adjacent wetland resource areas, including alteration of vegetative cover type and community, wildlife habitat, temperature and other physical characteristics that play a role in the BVWs, Banks and their interests.

**Comment #57:** In order for the Commission to better understand the nature and impact of the proposed alterations, BSC recommends that the Applicants provide square footages of each type of impact (impervious/pervious; naturally vegetated/unvegetated; grading, stormwater management, etc.) within the Buffer Zone, as noted above. BSC further recommends that the Applicants provide percent slope information (see slope discussion in Buffer Zone Science section below) on post-construction slopes within Buffer Zones proposed to be altered and also in areas between the Limit of Work and wetland resource areas. Locations and areas where slopes are greater than 5% should be indicated on Site Plans and in table format and should indicate the specific percent slope for each area as well as soil types for each area. BSC recommends that the



Applicants provide the total number of square feet of Buffer Zone that exists on the project site. This quantified evaluation could be presented in table format, and on Site Plans. Full evaluation of impacts is not possible without this quantification of impacts, and BSC recommends further evaluation of impacts following submission of this information.

In the north and western portion of the Project Site (NOI #1), the Applicant proposes steep grading immediately upgradient from the proposed wetland restoration/replication area, from the Aberjona River, from Sweetwater Brook, from the proposed compensatory BLSF, and location of development within the Buffer Zone (including the Buffer Zones for Wetlands C and P). Much of the development is proposed on previously developed land.

**Comment #58:** As mentioned above, BSC recommends that the Applicants provide a table indicating the area and type of impact so that Buffer Zone impacts can be better understood. Provision of a site plan that shades the different types of impacts within the different Buffer Zones would also help provide clarification, given the complexity of this Project Site.

**Comment #59:** BSC recommends that Site Plans #1 and #2 show the post-construction Buffer Zone lines as well as pre-construction Buffer Zone lines, as the proposed wetland mitigation area will extend the Buffer Zone lines further into upland.

**Comment #60:** It is not clear how grading and construction of steep slopes immediately adjacent to the wetland restoration/replication area, the Aberjona River, Sweetwater Brook, and compensatory BLSF ensures that downgradient wetland resource areas will not be impacted, and how such grading activities contribute to the Interests of the WPA. BSC recommends that the Applicant clarify.

In the southern portion of the Project Site (NOI #2), the Applicant proposes conversion of a large part of a sloping, primarily forested Buffer Zone to development and associated grading including installation of relatively steeply sloping stormwater basin (CSW) embankments, a riprap spillway, an access drive, and homeowner yards, decks, retaining wall and housing. Housing, access drive and decks are proposed in the outer portion of the 150-foot the Buffer Zone. The location of the CSW, grading, and development footprints within the Buffer Zone (as well as non-jurisdictional areas further upgradient) indicates that substantial earth disturbance is proposed in uplands.

**Comment #61:** A full understanding of the capacity of the CSW to transmit pollutants via groundwater to the adjacent BVW and Aberjona River, or to alter the groundwater table and flows, would require a groundwater study. The burden of proof is on the Applicant to demonstrate that proposed activities contribute to the Interests of the Act, and therefore the Applicant could provide such information to clarify potential impacts or lack thereof.

**Comment #62:** BSC recommends that the Applicant provide information regarding how the CSW located in the Buffer Zone on Site Plans #2 will avoid becoming a decoy wetland for wildlife, particularly amphibians.



**Comment #63:** BSC recommends that the Applicants provide documentation that proposed construction activities will not reduce the capacity of the Buffer Zone to support the wildlife habitat functions of the downgradient wetland resource areas, including the Aberjona River, by reducing habitat in the Buffer Zone a) during the construction phase and b) following the construction phase. See Wildlife Habitat discussion.

**Comment #64:** BSC recommends that snow storage areas be identified on Site Plans, as requested by MassDEP and as required by Woburn Wetlands Ordinance Rules and Regulations Section V.C.15, and that they be located outside of the Buffer Zone.

### **Buffer Zone Science**

There is broad agreement in the scientific literature that buffers to wetland resources contribute in significant ways to the protection of the ecological function of wetland resource areas. The WPA regulations recognize this functional linkage by requiring review of activities within the 100-foot Buffer Zone, and the Woburn Wetlands Ordinance recognizes a 150-foot Buffer Zone. By protecting ecological function, buffers protect the ecosystem services (including the Interests of the WPA and the Ordinance) that wetland resources provide to human communities and to fish and wildlife. Many peer-reviewed studies provide guidance for establishing buffer zone setbacks that will be effective at protecting specific ecosystem services/Interests of the WPA. The specific setback distance required is dependent upon a number of factors, including the ecosystem service/Interest of the WPA that is being protected, the condition of the existing wetland resource area and its existing capacity to provide the ecosystem service, the condition of the existing buffer and its existing capacity to protect the wetland resource area and associated ecosystem services/Interests of the WPA, the nature and intensity of the work or activity being proposed, slope, soil texture, climate and weather, construction phase erosion and sedimentation controls, season, and monitoring. Buffer zone setback distances recommended in scientific literature are discussed and provided below.

**Comment #65:** BSC recommends that the Applicant integrate these buffer zone setback recommendations into alternative layout designs as part of the recommended alternatives analysis (see alternatives analysis discussion above).

BVW and Bank are presumed to be significant to all of the Interests of the WPA with the exception of Land Containing Shellfish. The following discussion addresses considerations when determining Buffer Zone setbacks and references specific Buffer Zone setbacks recommended by the Guidebook (2019) and the scientific literature cited in the Guidebook (2019). Following discussion of specific considerations, recommended Buffer Zone setbacks are provided for each of the Interests of the WPA that are presumed significant for BVW and Bank. The Interests of the WPA are grouped according to function.



## Slope

BSC notes that scientific literature identifies slope as a major and significant factor in determining Buffer Zone setback distances, and that steeply graded slopes necessitate wider Buffer Zone setbacks in order for the Buffer Zone to effectively protect the WPA Interests that are provided by the adjacent wetland resource area. The Guidebook provides the following table for extending naturally vegetated buffers in areas with steep slopes:

Table 1: Effect of slope on buffer zone width for water quality.

SLOPE ADJUSTMENT	
Slope Gradient	Additional Buffer Multiplier
5-14%	1.3
15-40%	1.4
>40%	1.5

Source: Modified from McElfish, JM Jr, Kihlslinger RL, Nichols, SS (2008) Planner's Guide to Wetland Buffers for Local Governments. Environmental Law Institute. ELI Project # 0627-01.

**Comment #66:** BSC recommends that the Applicants refer to this table when developing alternative layouts (see alternatives discussion above) and establishing a Buffer Zone width that contributes to the Interests of the WPA.

## Buffer Zone Cover Type

The scientific literature identifies forested land with trees or a mix of cover types (i.e. trees, shrubs and grasses) as being most effective at providing protection of adjacent wetland resource areas. Site Plans and aerial photographs for the proposed project indicate that almost all of the Buffer Zone in the southern and western portion of the property will be converted from forested or mixed cover Buffer Zone with sloping land (that includes shrub and herbaceous layers as well as trees) to herbaceous or shrub cover, some of which will likely be maintained as landscaping/lawn and some of which will be maintained as a constructed stormwater wetland (CSW), or to access roads/drives, or to structures such as decks, buildings, and retaining walls. The outer CSW embankment immediately adjacent to the 25-foot Buffer Zone will be constructed with steep slopes, thus further degrading the capacity of the Buffer Zone to protect the adjacent downgradient wetland resource areas.

**Comment #67:** BSC recommends that the Applicant identify how the proposed Buffer Zone cover type conditions in each identified alternative contribute to Interests of the WPA.

**Comment #68:** BSC recommends that the Applicants identify alternatives that avoid the need for such steep grading and retaining walls within the Buffer Zones.

## Buffer Zone Soil Type(s)

Infiltration of rainfall and stormwater, and removal of pollutants and sediment, is limited where soils are compacted (dense glacial till) or fine-textured (high clay content). Where soils are coarse-textured and highly permeable (such as sands), water can pass through too quickly for



optimal plant uptake of nutrients. Organic content tends to be low in coarse-textured soils, thus reducing pollutant retention. Ideal soil texture tends to be moderately coarse, such as glacial outwash (Guidebook p. 19). Different soil types in the Buffer Zone have different capacities to buffer the adjacent BVW from upland impacts. Differences in soil type lead to differences in capacity to filter and remove pollutants, thereby impacting the ability of the soil to protect surface and groundwater quality.

**Comment #69:** BSC recommends that the Applicants provide a table indicating the soil series, soil texture(s), and soil drainage class(es) for the downgradient wetland resource areas, for each proposed impact area and for all Buffer Zone areas between proposed development and the adjacent BVW.

### **Intensity of Land Use**

The Guidebook cites intensity of land use as a factor in determining Buffer Zone width, with areas of high intensity, such as the proposed project, requiring increased buffer widths in order to achieve protection of the adjacent wetland Resource Area. As mentioned previously, the Environmental Law Institute's Planner's Guide to Wetland Buffers for Local Governments (McElfish et al 2008) (ELI Planner's Guide) notes that, "Buffers of less than 50 feet were more susceptible to degradation by human disturbance." BSC notes that the two NOIs propose development of much of the existing naturally vegetated Buffer Zone up to the 25-foot Buffer Zone line, and in some areas, i.e. the two proposed crossings of Sweetwater Brook and Wetlands C and P Buffer Zones, within the 25-foot Buffer Zone and into the wetland resource areas.

**Comment #70:** BSC recommends that the Applicant provide documentation as to how the proposed conversion of such a high percentage of naturally vegetated land and Buffer Zone will contribute to the Interests of the Act.

### **Public or Private Water Supply/Groundwater Supply/ Prevention of Pollution**

The Guidebook cites literature that generally recommends a minimum of 30 – 100+ feet of buffer in order to protect water quality under typical conditions. The minimum buffer width should be increased where slopes are steep, where land use is intense, where soils are either too compacted or too coarse for optimal water quality protection, and where cover types are less effective than forested land. The slope table (Table 1) can be used to calculate increased buffer width to protect water quality where slopes are steep. Given that the proposed project will create steep slopes, and includes existing steeply sloping land, and that proposed land use is intense, and that forested land will be converted to development or herbaceous/shrub/landscaped land, minimum buffer widths are not likely to be sufficiently protective of the adjacent wetland resource areas and associated Interests of the WPA with regard to maintaining existing water quality.

**Comment #71:** BSC recommends that the Applicants include a commitment, in perpetuity, that no additional clearing will occur within the Buffer Zone following completion of project construction, and that pesticides, herbicides, fertilizer and de-icing agents will not be used within the 100-foot Buffer Zone.



**Comment #72:** BSC recommends that the Applicants provide documentation regarding how compliance with stipulated parameters for use of pesticides, herbicides, de-icers, and fertilizer will be achieved on the site in perpetuity. Should the Applicant wish to allow pesticides, herbicides, fertilizer and de-icing agents within the 100-foot Buffer Zone, then the Applicants should provide documentation that their use will contribute to the Interests of the Act.

**Comment #73:** BSC recommends that the Applicants incorporate this information as alternative site layouts are developed and provide documentation of how the project, under each alternative, contributes to each of the water quality Interests of the Act.

### **Flood Control/Storm Damage Prevention**

Buffer Zones provide additional storage space for flood waters and contribute to storm damage prevention. Wetland resource area and Buffer Zone vegetation slow the velocity of storm and flood waters, thus reducing storm and flood damage to downstream properties. The Otter Creek wetland-floodplain complex in Middlebury, Vermont reduced the cost of flood inundation by 92% compared to an area without a wetland-floodplain complex, which translated into annual savings of \$126,000 - \$450,000 (Watson et al 2016). Wetland resource areas on the Project Site include densely vegetated forestland with areas of shrub and herbaceous cover. As noted above, the U.S. northeast is experiencing a significant increase in heavy precipitation events. Thus, the flood control and storm damage prevention functions of wetlands and floodplains have greater value now than ever before and will continue to increase in value as our climate continues to change.

If the Applicants wish to alter the Buffer Zone to such a large extent and in such close proximity to wetland resource areas, the Applicants could provide additional flood modeling data that identify the future floodplain on the project site over the coming decades (such as 2030, 2050, and 2100), and how it contributes to flood control and storm damage prevention. BSC notes that the Woburn Wetlands Ordinance Rules and Regulations (Section II.2.k) identify, “Any activities that decrease the capacity of wetlands to respond to the impacts of climate change” as an alteration, implying the need to evaluate future conditions during the design process.

**Comment #74:** Additional information is needed to evaluate the potential of project alternatives identified in an alternatives analysis to impact or contribute to the flood control and storm damage prevention Interests of the WPA, particularly in light of changing conditions due to climate change. BSC further notes that proposed development occurs in close proximity to lot lines, and thus alteration of the Project Site has the potential to impact adjacent properties.

### **Protection of Fisheries/Wildlife Habitat**

Please see the Regional Setting and Wildlife Habitat section for additional comments. Buffer Zones are essential for the protection of the wildlife habitat and fisheries Interests of the WPA. Buffer Zones screen wetland wildlife habitat from human disturbance and protect the water quality and quantity-related functions of the wetland. Buffer Zones help preserve connectivity



between naturally vegetated areas, thus facilitating wildlife movements across the landscape (see Regional Setting and Wildlife Habitat discussion for greater detail). The project as currently proposed, will convert most of the existing naturally forested Buffer Zone habitat to development or newly created graded slopes as discussed above, and will remove existing course woody debris, standing dead trees, tree cavities, natural and anthropogenic stone features, and trees and shrubs that provide habitat and food for wildlife. Construction phase earth moving activities will disturb or destroy burrows used by wetland and waterway species that live in the Buffer Zone (see Wildlife Habitat comments). These Buffer Zone alterations will reduce important wildlife habitat features of the wetland-Buffer Zone complex on the site and will reduce the wildlife habitat value of the wetland itself as a result.

In Massachusetts, 75% of freshwater wetland-dependent species, 95% of wetland-dependent amphibians, and 100% of wetland-dependent mammals also require upland habitat for essential life functions, such as nesting, reproducing, feeding, resting, and overwintering (Boyd 2001). This is particularly true of amphibians, as well as a variety of bird species, and many mammals that would be expected in these wetland resource areas.

Buffers function to maintain the characteristics of wetland hydrology (Davis, et al. 2019) including temperature of standing and flowing waters and microhabitat conditions within wetlands and waters, such as humidity and temperature at the ground and water surface level. These characteristics are of critical value in providing the wildlife habitat value of wetland resource areas and can affect the temperature and conditions of fish habitat associated with downstream waters. With substantial removal of forested areas in the 100 and 150-foot Buffer Zones on the Project Site, as well as forestland upgradient of the Buffer Zones, there likely will be alteration of standing and flowing water temperature, humidity, and air temperature at ground and surface levels within the wetland resource areas (Castelle et al., 1994). Also see discussion of protection of water quality (above).

Buffer zones provide shading, seed sources, temperature and moisture regulation, and help minimize the risk of establishment of invasive, exotic plant species. The plant community composition and structure is a feature of jurisdictional wetlands. Elimination of substantial portions of the naturally vegetated Buffer Zones is anticipated to lead to changes in wetland resource area plant community composition and structure (Houlihan et al., 2006), thereby leading to changes in wildlife habitat within the BVW.

Maintenance of a naturally vegetated buffer helps to minimize impacts associated with human encroachment. Many wildlife species are sensitive to collection, are negatively affected by dogs, artificial light, and other effects of proximity to humans and will therefore be dissuaded from continuing to inhabit an encroached-upon wetland resource area. Maximizing a naturally vegetated Buffer Zone is likely to minimize negative effects of encroachment.

Human activity introduces changes to the surrounding environment that can negatively impact natural habitat. Changes in lighting in an area, for example, can significantly affect some species'



behavioral and biological rhythms, which are guided by natural cycles of light and dark. Nocturnal species, particularly birds, can become disoriented by night-time lighting. Domestic pets, particularly cats, may prey excessively on wildlife, such as ground-nesting birds. The availability of household trash can alter the composition of wildlife communities by providing food for animal populations that thrive on trash (such as rats, raccoons, and skunks) to the detriment of those that do not, e.g. small mammals and songbirds. (NH Department of Environmental Services). Clearing the existing naturally vegetated and forested Buffer Zone to such a great extent will lead to greater light-related impacts to wildlife in the adjacent wetland.

The State of Washington Department of Ecology (Hruby 2013) conducted an extensive literature review and recommends a minimum buffer of 150-300+ feet to protect high value wetland habitat, regardless of intensity of adjacent land use, and 75 – 150 feet to protect moderate value wetland habitat, if adjacent land uses are moderate or high intensity. Under the Massachusetts WPA, only activities within the 100-foot Buffer Zone can receive regulatory review, and under the Woburn Wetlands Ordinance, only activities within the 150-foot Buffer zone can receive regulatory review. Effective Buffer Zone width is often dependent upon the specific species being considered and can range up to a few thousand feet. Factors such as condition of the Buffer Zone, intensity and nature of proposed work, etc. are also important considerations. Given the scientific findings about the importance of the Buffer Zone to protection of fisheries and wildlife habitat, if a Buffer Zone is naturally vegetated, and particularly if it is a forested Buffer Zone, then the full 100 or 150 feet of Buffer Zone can be assumed to contribute significantly to protection of wetland resource area fisheries and wildlife habitat. While no fish are likely to be living in the land-based wetland resource areas on the project site, such as BVW, headwater wetlands contribute important nutrients to downstream waters which do support fish, and can contribute to maintenance of downstream water temperatures, and thus are important to protection of fisheries as well as wildlife habitat.

**Comment #75:** Particularly given that the Applicants proposes alteration of the majority of the naturally vegetated Buffer Zone, BSC recommends that the Applicants provide information documenting how the proposed project contributes to the protection of fisheries and wildlife habitat Interests of the Act and document the differences in this regard between alternatives identified in the alternatives analysis.

### **Further Recommendations**

**Comment #76:** If the Applicants wish to reduce regulatory Buffer Zone widths below the scientifically supported widths, then BSC recommends that the Applicants provide (see burden of proof and regulatory discussion above) detailed, site-specific data documenting that either the adjacent wetland resource areas are not significant to the presumed Interests, or that the existing Buffer Zone does not function to protect the adjacent wetland resource areas and their presumed Interests, or that the proposed alteration of Buffer Zone and intensity of site development contribute to the protection of the Interests and will not significantly reduce the capacity of the Buffer Zone to protect the adjacent wetland resource areas and associated presumed Interests.



Documentation should address the current condition of the BVW, Bank and the Buffer Zone, the nature and intensity of proposed work, including changes in slope, cover type, soil texture and permeability, construction phase impacts, and other relevant factors discussed in this letter for each specific proposed impact area and the Buffer Zone area between the proposed impact area and the adjacent BVW and vernal pool, per WPA regulations 310 CMR 10.00 et al.

### **CONSTRUCTION PHASE EROSION AND SEDIMENTATION CONTROLS**

**Comment #77:** Construction phase impacts and proposed erosion and sedimentation controls can only be evaluated fully when the Applicants provide the requested alternatives analysis. Given the steep grades on the site, it is likely that additional controls will be necessary as construction proceeds.

### **INVASIVE PLANT SPECIES CONTROL PLAN**

Attachment G in NOI #1 provides an Invasive Plant Species Control Plan (IPSCP) for the Project Site. BSC has not accessed the Project Site other than a single walk along the MWRA right-of-way, and thus has not conducted a full invasive species survey. During the site walk, BSC noted additional invasive species that are not included in the IPSCP, including porcelain berry (*Ampelopsis brevipedunculata*), winged euonymus (*Euonymus alatus*), Norway maple (*Acer platanoides*), tree of heaven (*Ailanthus altissima*), and multiflora rose (*Rosa multiflora*). BSC also notes that HWG observed additional invasive species on the Project Site.

**Comment #78:** BSC recommends that the IPSCP be expanded to address all of the invasive species observed on the project site.

### **ASSESSMENT OF NATURALLY VEGETATED LAND, INCLUDING LAND LOCATED OUTSIDE OF STATE AND LOCAL WETLAND RESOURCE AREAS AND THEIR REGULATED BUFFER ZONES**

Most of the northern part of the Project Site has already been developed and retains relatively little natural cover, as it was formerly the Kraft Atlantic Gelatin Factory and used for industrial purposes. Conversely, the southern portion of the site is primarily naturally vegetated, with much of the area covered by forest or trees interspersed with shrubs and herbaceous areas. Large portions of the Project Site, both north and south, are located outside of wetland resource areas and associated Buffer Zones.

The following discussion provides a natural resources assessment of the predominantly forested and naturally vegetated area located west and south of the previously developed Kraft Atlantic Gelatin Factory industrial site, to provide an understanding of the character of these natural



resources and the ecosystem services provided. This naturally vegetated area includes regulated wetland resources and associated Buffer Zones, including and adjacent to the Aberjona River, on the southwest side of the property, as well as naturally vegetated, primarily forested, land upgradient and east of wetland resource area Buffer Zones. This unregulated upland area is referenced as naturally vegetated upland. BSC provides the following discussion of ecosystem services provided by the naturally vegetated upland, including significance with regard to regional role, greenhouse gas emissions and carbon sequestration and storage, climate resiliency, wildlife habitat, and soils.

In the sections below, BSC provides suggested actions that could be taken to:

- Reduce or offset the environmental and ecological impact of proposed project activities,
- Support increased resiliency to climate change, and
- Provide climate change mitigation for carbon-related impacts of proposed project activities.

## **REGIONAL SETTING AND WILDLIFE HABITAT**

The Project Site offers good quality habitat for a wide variety of wildlife species that thrive in human-altered landscapes. Although there does not appear to be any particularly exceptional habitat feature present in the context of eastern MA habitat types, the habitat present is somewhat noteworthy based on the relative rarity of large, undeveloped parcels in the surrounding landscape. The Project Site's position in the landscape also serves to add additional value as wildlife habitat. A large area of protected and undeveloped land (Winchester Water Supply Lands, Middlesex Fells Reservation) lies immediately to the south of the subject parcel. Although the subject parcel is separated from this protected area by a strip of residential development, the parcel is an extension of and buffer to the protected area, and mobile species such as medium- and large- sized mammals and birds are expected to access and use the subject parcel as an extension of that protected area. Additionally, the subject parcel connects directly to the Aberjona River, in turn connecting the protected lands to this feature.

Greenways associated with river corridors are commonly used for travel by a wide range of wildlife species (e.g., Bennet 1999). The Aberjona River corridor is largely surrounded by a buffer of natural land cover which varies in width but creates a consistent greenway for essentially the length of the river. This greenway extends from from Mishawum Lake in Woburn which connects a mosaic of undeveloped and/or protected lands to the north of Woburn, to the Mystic Lakes in Arlington and Medford, which connect to the Mystic River Reservation and the Alewife Brook Reservation. The Aberjona River corridor connects a wide variety of types and sizes of open, undeveloped lands in an otherwise urbanized setting, and provides a unique opportunity for wildlife to move through this landscape.

Based on the direct observations and desktop assessment, the Project Site itself also provides a variety of habitat resources for wildlife. The forest area that could be directly observed from the



MWRA right-of-way was relatively mature and diverse, and the aerial imagery suggests that the cover type across the rest of the parcel is consistent with what was observed. Large trees, over 20 inches in diameter at breast height (dbh) were common, and trees 30 inches dbh and greater were also present. Large, mature trees generally have a greater number hollows in their trunks and/or dead or broken limbs, all of which provide shelter and nesting locations for wildlife. Large, mature trees are also more likely to die, and when dead, rot slowly and stand for long periods, providing additional hollows, sloughing bark which bats commonly roost under, and generating substrate for woodpeckers to create nesting holes. In addition to the cover and nesting structure provided by the mature trees, there was a moderate amount of coarse woody debris (CWD) on the ground which provides a similar function for small ground-dwelling species. Exposed rocky outcrops, which can also provide shelter for ground-dwelling species, were also observed on the slopes near the entrance of the MWRA right-of-way, and the topography of the parcel suggests that these types of features are likely to be present in other locations throughout.

The overstory that could be observed from the MRWA right-of-way was dominated by mast producing species (oaks, maples, ashes) which provide important food resources for many species of wildlife, and the aerial imagery indicates that the cover throughout the parcel is almost exclusively hardwoods. Other sources of foods observed included grapes and a variety of invasive species, including porcelain berry (*Amur peppervine*) and Asiatic bittersweet (*Celastrus orbiculatus*), especially along the Aberjona River corridor. A high load of invasive species along the River dominates the herbaceous layer and understory, and is climbing into the overstory, while the vegetation away from the river to appears to be largely native species. Where it could be directly observed, this understory away from the river was largely sugar maple, with some beech. In some areas the herbaceous/shrub layer was very sparse, while in in other locations it was dominated by green briar (*Smilax sp.*), which was heavily browsed by deer. A list of the dominant plant species, and their scientific names, observed from the MRWA right of way is provided in Table 1.

The wildlife species observed on or adjacent to the subject parcel, either directly or by sign are listed in Table 2. In addition to these species, a variety of other common wildlife species that thrive in human-influence landscapes are likely to use the parcel and are also listed in Table 2. The bird species are taken from the closest available e-bird observation list, from Davidson Park in Winchester (<https://ebird.org/barchart?byr=2000&eyr=2020&bmo=1&emo=12&r=L4628460>), which lies along the Aberjona River. The species in Table 2 only reflect the common species that use the habitat types that occur on the subject parcel. Additional less common species may at times use the habitat on the Project Site.

### **Impacts**

Removing the natural cover type and grading the natural topography of the Project Site will significantly reduce its wildlife habitat value by reducing the food and cover resources present.



This loss of resource and introduction of infrastructure and human activity will reduce the numbers and species of resident wildlife and discourage animals moving across the landscape from accessing the travel corridor created by Aberjona River. Loss of cover and disturbance close to the river itself will reduce its overall value as a connection to the surrounding landscape.

However, the species that currently use the subject parcel are those species that do adapt to human-influence landscapes, and some individuals are expected to continue using the subject parcel to some degree. The degree to which these species and individual can continue to use the parcel depends on the characteristics of the proposed development and the total acreage of habitat that remains following project construction. Considerations which will make the development more wildlife friendly are described below.

### Suggestions

1. Leaving as much natural vegetation and topography in place as possible will reduce the habitat loss due to the proposed project. Preferably, this will include identifying mature trees to remain on the site and protection of their root zone (generally consistent with their drip line) during construction.
2. Avoiding the river corridor and leaving the largest possible buffer around the corridor will reduce impacts to animal movement within the river corridor, benefiting both resident wildlife and wildlife that are moving through the area as they travel across the local landscape. A larger buffer will also more effectively maintain other wetland and river ecosystem functions, which in turn supports the overall habitat value of the river corridor.
3. Landscaping installed as part of the proposed project should mimic native landcover to the extent possible. Turf lawns should be minimized in favor of native trees, shrubs, and meadow-type ground covers. Manicuring of landscaping should be minimized to allow nesting and cover structure to develop.
4. Maximizing conservation and reuse of existing Project Site soils where soils are not infested with invasive species or contaminated from past industrial activities. Reference to guidance for maintenance, restoration and development of healthy soils is recommended, both for the construction period and for long-term management of land associated with this project. The Massachusetts Office of Energy and Environmental Affairs is nearing completion of the Massachusetts Healthy Soils Action Plan, which may be a resource in the near future. Should it become available during the project planning process, BSC recommends review of soil and vegetation management practices for conformance to recommendations made in this document.
5. Use of herbicides, pesticides, and fertilizers should be minimized or eliminated altogether.



## **GREENHOUSE GAS EMISSIONS, CARBON SEQUESTRATION AND STORAGE**

Naturally vegetated land has great capacity to sequester carbon from the atmosphere into biomass and then into soils, and thus reduce the impact of climate change. Forests and wetlands (Nahlik and Fennessy 2016) are particularly significant in this regard. When naturally vegetated land is disturbed or converted to developed use, significant amounts of carbon are released from living biomass and from soils, thus exacerbating and accelerating the warming of our climate (Fargione et al 2018, Moomaw et al 2018, National Academies of Sciences, Engineering and Medicine 2018). In addition to this loss of stored carbon (often referred to as carbon stocks), which is similar to the loss of money from a bank account when withdrawals are made, conversion of naturally vegetated land to developed land can greatly reduce or eliminate the future capacity of the land to sequester carbon, similar to how job loss reduces or eliminates the capacity of a worker to make future deposits into their bank account.

“Soils lose 54% of the average forest SOC [soil organic carbon] stock when converted to turf and 74% when converted to impervious land covers.” – Draft Massachusetts Healthy Soils Action Plan

The following discussion provides an assessment of how the proposed Project will impact the existing capacity of the Project Site’s naturally vegetated land to store and sequester carbon from the atmosphere, providing an estimate of the loss of these ecosystem services to the larger community. Additionally, some suggestions are provided regarding possible modifications to the proposed Project that could help offset the proposed impacts. Currently, impacts to the carbon storage and sequestration capacity of undeveloped land is not regulated in Massachusetts. Therefore, these comments are offered for consideration as efforts to design a project with reduced/minimized impacts to the environment and to the larger community proceed.

### **Impact Assessment**

The proposed Project will convert most of the existing naturally vegetated upland (both within Buffer Zone and upgradient of regulated Buffer Zone) to developed land and will reduce the area of forest from approximately 29 to 4 acres. Nine of the forest acres will become impervious surface, and 16 will become open space. For purposes of estimating changes in greenhouse gas sequestration and storage, we assume that the open space will be re-planted with partial covering of shade trees, shrubs, and grass (landscaping). More than half of the existing carbon stored as biomass or in the soil will be lost, and the ability of the land to remove carbon dioxide (CO<sub>2</sub>) from the atmosphere will be significantly reduced.

Estimates indicate that:

- Carbon stocks will be reduced from 10,269 to 4,353 metric tons CO<sub>2</sub> equivalent, a decrease of 58% that represents an immediate emission of 5,916 metric tons of CO<sub>2</sub>.



- The capacity of the land to remove CO<sub>2</sub> from the atmosphere will be reduced from 69 to 28 metric tons per year, or a decrease of 60%.

These estimates are based on regional and county averages, and not on specific measurements at the Project Site.

To put these numbers into perspective, the Massachusetts Global Warming Solutions Act (GWS Act) (Chapter 298, Section 6, Chapter 21N, Section 2) requires that stationary emitting facilities report greenhouse gas emissions in excess of 5,000 tons<sup>1</sup> per year in carbon dioxide equivalents. Greenhouse gas emissions resulting from land conversion are not regulated under the GWS Act, but we note that the immediate emissions associated with the proposed Project would exceed the reportable threshold, if the source of emissions were a stationary facility. In addition to this, the capacity of the land to sequester CO<sub>2</sub> going forward is likely to be permanently reduced by 60%.

### **Estimation Methods**

Growth rates for undisturbed forest were estimated by querying the U.S. Forest Service forest inventory database using EVALIDator (U.S. Forest Service, no date). Carbon growth estimates included all ecosystem carbon pools: live above- and below-ground biomass; dead wood including standing- and down-dead trees; forest floor; and soil carbon. Currently available data about soil carbon does not vary by age class so does not contribute to growth estimates. Previously calculated estimates for “temperate continental forests” within which the Project Site is located were used. Use of regional averages was validated by comparing with biomass growth data specific to Middlesex County, Massachusetts. The regional average biomass growth has been 1.04 metric tons/acre/year over the last 10 years, and the Middlesex County biomass growth has been 1.06 metric tons/acre/year over the same time period.

Existing forest carbon stocks were estimated using the U.S. Forest Service database as described above. The estimated carbon stocks of the forest prior to conversion are 42.3 metric tons/ac for biomass, 12.3 metric tons/ac for dead wood and litter, and 40.3 metric tons/ac for soil carbon. Changes in carbon stocks that result from changes in land use were estimated by using the average changes in the carbon stocks of biomass, dead wood, and soil that are used nationally in the U.S. greenhouse gas inventory conducted annually by the U.S. EPA (2009). This data is lacking at regional and local scales, so national “defaults” were the only option. Losses upon conversion to impervious surface were estimated at 100% for biomass and dead wood/litter, and 30% for soil carbon. Losses upon conversion to open space (assuming that some trees, shrubs, and grass are established) were estimated at 50% for biomass, 100% for dead wood/litter, and 0% for soil carbon.

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<sup>1</sup> According to the MassDEP Greenhouse Gas Reporting 310 CMR 7.71 Applicability Screening Tool for Facilities Instructions and Background (Tool), the GWS Act refers to short tons. The Tool states, “One short ton is equal to 2,000 pounds or 0.9072 metric tons.”



## **Suggestions**

With regard to offsetting the carbon storage and carbon sequestration functions of the existing undeveloped land on the Project Site, a number of measures could be taken. The following list of suggestions is offered for consideration:

1. Review Site Plans where conversion of naturally vegetated land to developed or landscaped land is proposed (particularly Site Plans #2) to identify opportunities to reduce the development footprint and retain existing soils and natural vegetation, particularly trees and forest.
2. Identify opportunities to reduce greenhouse gas emissions from the Project Site during construction and after construction. Possible opportunities could include:
  - a. Installation of solar panels on rooftops and as canopies over parking areas and top level of parking garages.
  - b. Installation of green roofs and green walls.
  - c. Installation of electric vehicle charging stations in garages and parking areas.
  - d. Adoption of healthy soil practices for landscaped and lawn areas to increase soil carbon sequestration.
3. BSC notes that the Woburn Wetlands Ordinance Rules and Regulations Section V.C.5 require site plans to show, “Existing stone walls, trees (3-inch caliper or larger), rock ridges and outcroppings”. BSC recommend that the Applicants provide this information on Site Plans #1 and #2.
4. BSC notes that the Woburn Wetlands Ordinance Rules and Regulations Section II.2.h and k state that the term “alter” shall include, “The destruction or relocation of plant life, including the cutting and removal of trees;” and, “Any activities that decrease the capacity of wetlands to respond to the impacts of climate change.” BSC recommends that the Applicants provide documentation that their proposed activities in the Buffer Zones are in compliance with these provisions. BSC recommends that the Applicants develop and assess alternatives that avoid the loss of naturally vegetated areas, trees and forestland within jurisdictional Buffer Zones.

## **CLIMATE RESILIENCY**

The natural resources on the Project Site provide climate resiliency ecosystem services for the surrounding human community, and for fish, wildlife and area ecosystems. As noted in the discussion of wildlife habitat above, the large tract of naturally vegetated land provides habitat for numerous wildlife species, particularly those that can navigate a suburban/urban environment. The Site’s proximity to the Aberjona River and other open spaces with natural features supports movement from one area to another, and expands the overall acreage of habitat available, thus allowing for larger populations. By providing wildlife travel corridors and a relatively large area of habitat, the Project Site increases the climate resiliency of area ecosystems and wildlife.



In addition to these ecological functions, the vegetated land on the Project Site provides climate resiliency ecosystem services to humans living in the area by providing:

- localized cooling and shade,
- flood storage,
- retention of groundwater,
- reduction of stormwater runoff,
- removal of pollutants from air and water,
- carbon storage and sequestration,
- has potential as a recreational resource (although private ownership has limited this function).

Reduction of air temperatures reduces energy needs for nearby structures, thereby reducing carbon emissions and associated energy costs for property owners, both commercial and private.

BSC suggests that proposed Project impacts to the climate and habitat related ecosystem services be avoided and minimized to the greatest degree possible, and that mitigation be provided for impacts that are not avoidable.

## SOILS

As noted above, atmospheric carbon is stored in soil as a result of carbon sequestration processes by plants, especially trees. While wetland soils store the most carbon due to their lack of oxygen, upland forest soils also store significant carbon.

While occupying only 5 – 8% of the world's land surface, wetlands store approximately 20% - 30% of the world's soil carbon. (Nahlik & Fennessy 2016)

In Massachusetts as well as nationally and internationally, best management practices (BMPs) are being identified to maintain, restore and improve soil health across all land cover types, including forests, wetlands, landscaping/turf and agricultural land. By implementing specific BMPs for each land cover type, soils can be healthier and more productive, and can retain more carbon. In general, soils with higher levels of soil organic carbon retain and store water better, are more productive and resistant to drought, and store more carbon.

1. To help offset conversion of one of the last remaining large tracts of naturally vegetated land in the Woburn area, the Applicants for this project could develop a Healthy Soils Management Plan for all post-construction cover types, including landscaped and turf areas, that would implement healthy soil BMPs on an ongoing basis.



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Further peer review is recommended once the requested information has been provided. BSC appreciates the opportunity to provide peer review services to the Winchester Conservation Commission. Please feel free to contact me at [gdavies@bscgroup.com](mailto:gdavies@bscgroup.com) or at (978) 621-8783 with any questions.

Sincerely,  
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