

May 1, 2024

Ms. Breeka Lí Goodlander, Agent  
Town of Franklin Conservation Commission  
355 East Central Street  
Franklin, MA 02038

**Re: Grove Street Residences – 121 Grove Street**  
**MassDEP File No. 159-1286**  
**Notice of Intent Peer Review**

Dear Ms. Goodlander:

BETA Group, Inc. (BETA) has reviewed revised documents and plans for the project entitled **Grove Street Residences**, located at **121 Grove Street** in Franklin, Massachusetts. This letter is provided to present BETA's findings, comments and recommendations.

## **BASIS OF REVIEW**

The following supplemental documents were received by BETA and will form the basis of the review:

- Peer Review responses entitled **Grove Street Residences – 121 Grove Street**; prepared by RJ O'Connell & Associates and Lucas Environmental; dated March 28, 2024. Inclusive of:
  - Peer Review Response Letter with Impact Analysis;
  - WPA Form 3;
  - Wetland & Buffer Zone Impact Exhibit;
  - Bankfull Determination Exhibits; and
  - Stream Crossing Hydrologic/Hydraulic Calculations.
- Plans (47 Sheets) entitled **Grove Street Development 121 Grove Street – Franklin, MA**; prepared by RJ O'Connell & Associates, Inc.; dated December 18, 2023, revised March 28, 2024; stamped and signed by Brian P. Dundon, MA P.E. No. 41505. Including:
  - Existing Conditions Plan (1 Sheet) entitled **Existing Conditions Site Plan 121 Grove Street Franklin Massachusetts**; prepared by Guerriere & Halnon, Inc.; dated May 20, 2022 and last revised November 9, 2023; stamped and signed by Robert E. Constantine II, MA P.L.S. No. 49611.
  - Landscape Plan (14 sheets) entitled **Grove Street Residences Franklin, MA**; prepared by Michael D'Angelo Landscape Architecture LLC; dated December 18, 2023; stamped and signed by Michael D'Angelo, MA P.L.A No. 4006.
- **Stormwater Management Report, Grove Street Residences, 121 Grove Street Franklin, Massachusetts**; prepared by RJ O'Connell & Associates, Inc.; dated December 18, 2023, revised March 28, 2024; stamped and signed by Brian P. Dundon, MA P.E. No. 41505.

Review by BETA included the above items along with the following, as applicable:

- Site Visit on February 1, 2024
- **Massachusetts Wetlands Protection Act 310 CMR 10.00** effective October 24, 2014
- **Massachusetts Stormwater Handbook** effective January 2, 2008 by MassDEP

- **Stormwater Management Chapter 153 From the Code of the Town of Franklin**, Adopted May 2, 2007
- **Wetlands Protection Chapter 181 From the Code of the Town of Franklin**, dated August 20, 1997
- **Town of Franklin Best Development Practices Guidebook**, dated September 2016

## PEER REVIEW UPDATE—MAY 1, 2024

The Applicant has provided revised materials and written comment responses pursuant to BETA's February 20, 2024 peer review letter. BETA's original comments from the February 20, 2024 peer review letter are included in plain text. Comment responses attributed to RJ O'Connell & Associates (RJOC) and Lucas Environmental (LE) are provided in *italics* and are prefaced with "*RJOC:*". The LE correspondence noted in the RJOC responses was not included in this letter for brevity; however, they are hereby incorporated by reference. BETA's most recent responses are provided in **bold** and are prefaced with "**BETA2:**".

BETA's responses in this letter identify additional information that should be provided by the Applicant to demonstrate compliance with the Act.

## SITE AND PROJECT DESCRIPTION

The Site is 31.44 acres and includes two (2) parcels along the western limit of Grove Street in Franklin, Massachusetts, further identified by the Franklin Assessor's Office as Assessor's Map 295, Lot 1 (121 Grove Street) and Map 294, Lot 7 (0 Grove Street). The Site is bound to the north and west by Franklin State Forest, to the east by Grove Street, and to the south by an electric transmission line right-of-way. A walking path associated with Franklin State Forest bisects the northern portion of the Site. Improvements located within the eastern portion of the Site along Grove Street include a single-family dwelling, accessory buildings, gravel and paved driveways, and lawn areas. The remainder of the Site consists of mixed hardwood uplands vegetated with species including Eastern white pine (*Pinus strobus*), American beech (*Fagus grandifolia*), and red oak (*Quercus rubra*); palustrine and emergent wetland complexes; and maintained fields. Topographic relief at the Site generally follows a west-to-east orientation.

Resource Areas Subject to Protection under the Massachusetts Wetlands Protection Act (M.G.L. ch.131 s.40) and its implementing regulations at 310 CMR 10.00 (collectively "the Act"), as well as the Town of Franklin Wetlands Protection Bylaw (Chapter 181) and its associated regulations (collectively "the Bylaw") are present at the Site and include:

- Inland Bank (to intermittent stream);
- Bordering Vegetated Wetland (BVW);
- Land Under Water (LUW); and
- Isolated Vegetated Wetland (IVW).

The boundaries of some onsite Resource Areas were previously confirmed by an Order of Resource Area Delineation (ORAD) issued under MassDEP File No. 159-1261 on April 6, 2023. Previously confirmed boundaries are as follows:

- The WFA and WFC Series BVW;
- The WFB Series BVW to the property line;
- The WFD Series IVW;
- The BF1 Series Bank to the property line;
- The BF2 Series Bank to the property line; and

- The BF3 Series Bank to the WFB Series BVW.

The ORAD confirms that the WFA and WFC Series delineate the boundary of a single BVW complex as depicted on the submitted plans; however, the BF4 through BF9 series Bank boundaries, as shown on the provided Project plans, were not reviewed or approved under this ORAD. In addition, the off-site FRW Series BVW that projects Buffer Zone onto the Site was not confirmed under the ORAD.

The Site is not located within any Surface Water Protection Areas (Zone A, B, or C), or Zone I or Interim Wellhead Protection Areas, but the northeast corner of the Site is within a Zone II Wellhead Protection Area. There are no Outstanding Resource Waters (ORWs) or Areas of Critical Environmental Concern (ACEC) present, and the most recent Natural Heritage and Endangered Species Program (NHESP) mapping does not depict any Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife at the Site. There are no NHESP-mapped Certified or Potential Vernal Pools located within 100 feet of the Site.

Natural Resource Conservation Service (NRCS) soil maps indicate the presence various soil groups at the Site including Charlton-Hollis Rock outcrop complex with a Hydrologic Soil Group (HSG) rating of A/B, Ridgebury fine sandy loam with a HSG rating of D, Hinckley loamy sand with a HSG rating of A, and Merrimac fine sandy loam with a HSG rating of A.

Proposed work is associated with a residential development pursuant to M.G.L. Chapter 40B (40B) and includes the following activities (collectively referred to as “the Project”):

- Construction of 5 detached apartment buildings (330 total apartment units);
- Construction of a clubhouse, swimming pool, parking bays, and dog park;
- Construction of paved parking areas (574 total parking spaces) and access driveways;
- Construction of two (2) intermittent stream crossings for roadways;
- Installation of two (2) intermittent stream crossings for a pedestrian boardwalk;
- Installation of lighting and utilities (includes municipal water and sewer);
- Installation of stormwater best management practices (BMPs);
- Installation of erosion controls;
- Maintenance of landscaping and green space; and
- Grading.

The Project will result in direct impacts to Bank, BVW, and LUW. Portions of all five buildings and associated amenities are proposed within the 100-foot Buffer Zone to BVW/Bank and Building #4 will require the filling of a 2,015-square foot (sf) IVW. As a 40B development, this peer review has been prepared with the assumption that the Bylaw will be waived by the Franklin Zoning Board of Appeals (ZBA); therefore, the Project is being reviewed only under the Act. Accordingly, impacts to the IVW, which does not qualify as Isolated Land Subject to Flooding (ILSF) under the Act, are presumed to be non-jurisdictional under this filing. Should the Bylaw apply to the Project, this review would be subject to revisions.

The Project was filed under the Limited Project provisions at 310 CMR 10.53(3)(e) for the construction and maintenance of a new roadway or driveway requiring a Resource Area crossing to access uplands and 310 CMR 10.53(3)(j) for the construction of the proposed boardwalks.

## ADMINISTRATIVE AND PLAN COMMENTS

The plan set (as identified above) is missing information and requires additional information for clarity.

**BETA2: Comments related to the plan set have been addressed.**

**Table 1. NOI Plan**

NOI Plan Requirements	Yes	No
North Arrow	✓	
Registered PLS Stamp (Existing Condition Plans Only)	✓	
Assessors' Reference	<b>BETA2: ✓</b>	
Abutting Property Assessors' Reference	<b>BETA2: ✓</b>	
Survey Benchmark	✓	
Existing Conditions Topography (with source and date of survey)	<b>BETA2: ✓</b>	
Accurate Plan Scale	✓	
Plan Scale 1" = 40' or smaller	✓	

**PLAN AND GENERAL COMMENTS**

A1. The Massachusetts Department of Environmental Protection (MassDEP) has issued a DEP file number (159-1286) with the following technical comments:

- a. "The Commission may want to consider a third-party review due to the complexity of this project, including but not limited to the review of the proposed stormwater system and the intermittent streams not confirmed in the ORAD process".

*RIOC: Third party peer reviews are being completed.*

**BETA2: No further comment.**

- b. "It is recommended that phased erosion controls are provided in addition to the construction sequence. Temporary swales and basins shall be shown on (phased) erosion control plans".

*RIOC: Phased erosion control plans have been completed and included in the revised plan set. These include temporary swales and basins. (See Sheets C-1A through C-1D).*

**BETA2: See BETA2 response to Comment W6.**

- c. "The site of the future infiltration basins should not be used as temporary sediment traps for construction activities, see V2, Ch2, p91 of the SW Handbook".

*RIOC: The plans have been revised to provide notes on the Erosion Control Plans that the bottom of the temporary sediment basin at the location of the infiltration basin (stormwater basin-1) shall be set one foot above the bottom of the proposed infiltration basin to ensure the underlying soil is not adversely impacted. Excavation of the bottom one foot to final grade and the installation of the crushed stone shall not be completed until after final stabilization. This last foot of excavation after site stabilization will remove all sediment and protect the underlying soil.*

**BETA2: According to the Massachusetts Stormwater Handbook, cited by MassDEP, an infiltration basin should never be used as a temporary sediment trap for construction activity. If excavation occurs, light earth-moving equipment for excavation of the infiltration basin should be used rather than heavy equipment due to the likelihood of compaction while using heavy equipment. The Commission could consider incorporating these requirements as a Special Condition.**

- d. "The Commission may want to include the Operation and Maintenance of the proposed stormwater system as a perpetual conditions."

*RJOC: Comment acknowledged. The applicant has no issue with the condition.*

**BETA2: No further comment. BETA concurs with the recommendation made by MassDEP.**

- e. "Given the steep slopes and their proximity to wetlands, MassDEP recommends the Commission include a condition that requires an inspection of erosion controls prior to and following any storm events greater than 1".

*RJOC: Comment acknowledged. The applicant has no issue with the condition.*

**BETA2: No further comment. The Project will disturb more than one acre of land, therefore a Notice of Intent (NOI) with EPA and a Stormwater Pollution Prevention Plan is required. To comply with the NPDES CGP, the contractor will be required to inspect erosion controls more frequently than identified in this comment.**

It is recommended that the Applicant address MassDEP's comments above in addition to the comments provided herein by BETA.

- A2. Depict Assessors' references for both the Site and the abutting properties on all plan sheets.

*RJOC: The Assessors references for the site and abutting properties have been added to the Overall Site Plan.*

**BETA2: Comment addressed. The Assessors' references for the Site and abutting properties have been added to the Overall Site Plan (Sheet OS-1).**

- A3. The proposed tree line is currently only depicted on the Landscape Plan sheets. Depict the proposed tree line on all plan sheets.

*RJOC: The proposed tree line has been added to all applicable site plan sheets.*

**BETA2: Comment addressed.**

- A4. Provide survey dates/methods for all on-the-ground topographic and boundary survey efforts in the plan notes.

*RJOC: The Existing Conditions Site Plan has been revised to include plan notes for the survey dates/methods for all on-the-ground topographic and boundary survey efforts.*

**BETA2: Comment addressed.**

- A5. The narrative references filing under two (2) limited project provisions ((310 CMR 10.53(3)(e) and (3)(j)) but the WPA Form 3 references only one. Provide a revised WPA Form 3 referencing both limited project provisions for the record.

*RJOC: The WPA Form 3 has been revised as requested. See Attachment #2.*

**BETA2: Comment addressed. The WPA Form 3 now references both limited project provisions.**

- A6. Provide a revised WPA Form 3 that includes temporary and permanent impacts proposed to LUW and includes both temporary and permanent impacts to BVW. Only permanent impacts are currently listed on the WPA form.

*RJOC: The WPA Form 3 has been revised as requested. See Attachment #2. Additionally, the impact numbers have been updated to show the temporary and permanent impact numbers (presented in the narrative of the original NOI), see LE Response Letter #1 within Attachment 1 of this letter.*

**BETA2: Comment addressed.**

## **WETLAND RESOURCE AREAS AND REGULATORY REVIEW**

BETA conducted a site visit and regulatory review of the submitted revised documents and plans, focusing on compliance with Resource Area definitions and Performance Standards set forth in the Act.

As noted above, an ORAD is in effect for the Site which confirms the boundaries of BVW, IVW, and the BF1, BF2, and BF3 Series Bank at the Site. Therefore, BETA only assessed Resource Area flagging in the field associated with the BF4 through BF9 Series Banks.

The Applicant has provided a comprehensive NOI filing with regards to filings requirements and supporting narratives. However, the NOI is missing a discussion of compliance with LUW Performance Standards and does not quantify proposed impacts to LUW for the proposed crossings. The stream/BVW crossings and boardwalks also require further detail on construction and sequencing to confirm all Resource Area impacts (temporary and permanent) are accounted for. In addition, the stream restoration area also requires further detail on construction and sequencing to ensure the establishment of appropriate hydrology/hydraulics and the long-term stabilization of Banks.

BETA noted several areas across the Project where constructability issues are apparent, including proposed grading tie-ins located under proposed erosion controls and what appears to be insufficient space to work and excavate for retaining wall construction along the faces of walls. As a result, the Project may actually require greater impacts to Resource Areas than what have been reported. In addition, select areas of BVW impacts along the retaining walls should be reassessed in the interest of avoiding/minimizing impacts.

At this time, the Applicant has not provided sufficient information to describe the Site, the work, or the effects of the work on the interests of the Act.

**BETA2: The Applicant has submitted revised materials that address a majority of BETA's comments and have resulted in reduced BVW impacts, a revised limit of work that supports the Project's constructability, and stronger justification for Resource Area crossings and associated design choices. The Applicant has also provided construction sequencing and phasing plans; however, the timing of environmentally sensitive activities including stream/BVW crossings (roadways and boardwalks), the wetland replication area, and the stream restoration areas remains unclear. Additional information has also been provided to outline restoration of previously impacted BVW; however, information regarding temporary and permanent stabilization efforts of Bank and LUW associated with the daylighted stream channel is still required. In general, several Special Conditions have been recommended for potential use in an OOC; however, implementing Special Conditions in lieu of requiring the submission of additional/revised materials during the public hearing process is at the Commission's discretion. Per the stormwater management review, the Project is also anticipated to require significant blasting that could have hydrologic impacts on the adjacent BVW unless test pit data is provided behind Buildings No. 1 and 2 to support the assumption that no significant blasting will be required.**

At this time, the Applicant has not provided sufficient information to describe the Site, the work, or the effects of the work on the interests of the Act.

## RESOURCE AREA BOUNDARY COMMENTS

BETA conducted a Site visit on February 1, 2024 to assess existing conditions and to review Resource Area boundaries not approved under the ORAD.

- W1. The ORAD approved the Bank boundary of 3 onsite intermittent streams (BF1, BF2, and BF3); however, there are 6 additional Bank series shown on the existing conditions plan and described in the NOI narrative per the Commission's request (BF4, BF5, BF6, BF7, BF8, and BF9). Of these Bank series, the Applicant asserts that only BF9 meets the definition of a stream<sup>1</sup> under the Act.

BETA reviewed all additional intermittent stream Banks flagged as part of this Project and concurs with the delineated boundaries. It is recommended that the Commission consider these features jurisdictional intermittent streams.

*RJOC: BETA's response is noted and furthermore, the impacts have been calculated very conservatively, assuming the referenced streams are jurisdictional to address BETA's following comments.*

**BETA2: No further comment.**

- W2. BETA did not review the FRW Series BVW in the field due to its location on private property. Based on the Project plans, work is not proposed within its associated Buffer Zone. The Commission could consider including a finding in an Order of Conditions (OOC) stating that these boundaries are not approved as part of this filing.

*RJOC: The Applicant agrees with this finding.*

**BETA2: No further comment.**

## CONSTRUCTION COMMENTS

- W3. Provide information supporting the location of the sewer line below the streambed at both stream crossings instead of within or along the roadway above the stream. Should the proposed location be required due to design/Site constraints, provide details on how construction will occur as it relates to the nature of the Resource Area impacts (i.e., open trench excavation versus directional drilling, and construction sequencing).

*RJOC: To allow for gravity sewer connection to the town sewer system and crossing of other utilities and drainage the proposed sewer line needs to be below the streambed at both stream crossings. The sewer lines are proposed below the streambeds, and above the footings of the culverts. The installation of the sewer lines will occur using trench excavation at the same time as the construction of the culverts, while the streams are temporarily diverted, and the surrounding resource area protected. See response to W5 for details on construction which will occur at the same time as the culverts. The existing streambed soils will be removed and stockpiled separately for reuse in reestablishing the streambed. The sewer lines are to be bedded as noted on the detail on Sheet C-10 and then backfilled with the existing channel bed material up to the final channel elevation within the culverts.*

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<sup>1</sup> 310 CMR 10.04 "Stream means a body of running water, including brooks and creeks, which moves in a definite channel in the ground due to a hydraulic gradient, and which flows within, into or out of an Area Subject to Protection under M.G.L. c. 131, § 40".

**BETA2: Comment partially addressed. BETA recommends that details relating to the installation of sewer lines as described above be included in the stream crossing construction sequence provided on Sheet C-1C.**

- W4. Clearly label all Resource Area impacts (both permanent and temporary) on the Project plans. It is recommended that this information be included on the Grading and Drainage plans to supplement the callouts that are already present. Although a separate Resource Area impact exhibit is provided, it is at a larger scale and does not depict proposed grades.

*RJOC: Additional Resource Area Impact Plans have been developed and added to the plan set as Sheet C-2D & C-2E. The plans clearly labels all MassDEP Resource Area impacts (both permanent and temporary) and depicts the proposed grades.*

**BETA2: Comment addressed.**

- W5. Erosion controls should be depicted on all sheets to demonstrate Project constructability. BETA offers the following comments on the proposed erosion controls:

- a. Erosion controls consisting of siltation fencing and compost filter tubes are proposed to be installed across the stream at both intermittent stream crossings as shown on the Demolition and Erosion Control Plan (Sheets C-1A and C-1B). These erosion controls are not a typical method of in-water erosion, sedimentation, and/or turbidity control. Clarify what time of year the crossing work will occur, what erosion controls will be used for in-water work (i.e., cofferdams), and how water will be controlled during construction of the crossing. To comply with the Section 404 Massachusetts General Permit, in-water controls should only be in place while required to complete the crossing work. At a minimum, the Applicant should provide location-specific water control and dewatering details for the proposed culvert work.

*RJOC: Phasing plans (C-1A through C-1D) have been developed to depict erosion control measures to be implemented during construction of the proposed project. The in-water erosion, sedimentation and/or turbidity controls have been revised at the proposed stream crossings to include sandbag cofferdams, pumps and water filter bags. These will be used to control the water flows within the intermittent streams during the construction of the culverts and to pump the water to the downstream side of the culverts to a filter bag. Details reflecting these controls have been provided on Sheet C-6. The crossing work will occur during forecasted dry periods and periods of low flow, where feasible. A note has been added to the plans that in-water controls will be removed as soon as possible once the work is completed and that area is stabilized.*

**BETA2: Comment partially addressed. Additional comments on the proposed water controls are as follows:**

- **Use of silt fence to supplement the sandbag cofferdam as shown in the detail (Sheet C-6) is unlikely to contribute to the efficacy of the cofferdam. BETA recommends that silt fence be removed and replaced with an impermeable material that will cover and protect the sandbags such as wrapped plastic sheeting.**
- **The downstream side of both Intermittent Stream Crossings No.1 and No.2 shows use of silt fence/ compost sock through the stream channel as a water**



control. Silt fence is unlikely to be an effective control; however, compost filter tubes (or sandbags, depending on water depth) could be used as an added protection to the downstream Resource Areas and mark the limit of work. It is recommended that the Applicant select a different water control method for the intermittent stream crossings. Downstream water/ erosion controls at both stream crossing should be specified on the plans.

- BETA recommends that the water filter bags for dewatering at both intermittent stream crossing be located further upgradient of the Resource Areas. A discharge of dewatering water to a Resource Area is subject to additional reporting requirements under the EPA NPDES for which this Project will be subject to.
- The Post Demolition Construction Sequence on Sheet C-1C does not identify a phase of the Project that the intermittent stream crossings will be installed. Revise the construction sequence accordingly or include this information on the Construction Phasing Plan (Sheet C-1E).

The Commission could consider a Special Condition in the OOC that the Agent be notified prior to the construction of the intermittent stream crossings, and that a plan showing in-water controls and dewatering for each stream crossing be submitted to the Agent for review and approval prior to construction.

- b. No erosion controls are shown at the location of either of the proposed boardwalks. Depict erosion controls proposed for boardwalk construction, describe the anticipated method of construction, and quantify any additional temporary BVW impact associated with installation of erosion controls, anti-compaction measures (i.e., swamp mats), and access for construction.

*RJOC: Erosion controls have been added adjacent to the proposed boardwalks within the existing wetlands and ground protection (construction) mats have been proposed at the intermittent stream crossings. The impact areas associated with the additional erosion controls have been revised and are reflected in the revised Wetland & Buffer Zone Impact Exhibit in Attachment 3 of this letter.*

*The applicant is anticipating constructing the boardwalks using a handheld helical pile installer for the screw pile bases. This will involve the use of chainsaws to clear the area and then using a walk behind skid steer to transport the building material through the proposed boardwalk corridor. However, if screw piles cannot be installed in some areas, due to shallow ledge, the contractor may need to install 12-inch concrete footings. Although helical piles are the preferred method of installation to minimize impact, the calculations of impact areas were conservatively calculated assuming the need for the 12-inch concrete footings.*

*The limits of work have been revised, as necessary, and the temporary/permanent BVW impact calculations have been updated as depicted on the Wetland & Buffer Zone Impact Exhibit in Attachment #3 of this response letter.*

**BETA2: Comment partially addressed. BETA recommends use of swamp mats throughout the length of the boardwalk installation where work is proposed within BVW. The Applicant should also provide a construction sequence for the proposed**

**boardwalks, similar to the sequence provided for the intermittent stream crossings on Sheet C-1C of the Project plans. The Commission could consider a Special Condition in the OOC that a boardwalk-specific construction sequence, including stabilization and restoration of temporarily impact BVW, be provided to the Agent for review and approval prior to construction.**

- c. Erosion controls are depicted directly adjacent to the proposed retaining upgradient of the BVW near the proposed pool and clubhouse, and within Buffer Zone north of Building #3. Considering that over excavation is required to set the footings for segmented block walls, additional temporary BVW/Buffer Zone impacts are likely to be required at these locations and the limits of work do not appear to represent a constructable Project. The Applicant should revise the limits of work and disclose all impacts accordingly.

*RJOC: The erosion controls in these areas have been reviewed and revised as necessary, the limits of work have been revised to ensure constructability. A cross-section detail showing the proposed wall, erosion control measures and wetland limits has been provided on Sheet C-16. This depicts areas where the proposed wall is at the closest proximity to the wetland and illustrates there is sufficient area for construction without impacting the wetland.*

**BETA2: Comment addressed. The provided detail shows that even at its closest point, 4 feet of work area between the erosion controls and retaining wall will be present. Furthermore, the impacts to BVW near the proposed pool and clubhouse have been eliminated.**

- d. Erosion control placement is directly over areas of proposed grade tie-ins along several locations around the Project perimeter (e.g., northeast of Building #2). Provide locations for erosion controls that support constructability and disclose any additional temporary/permanent BVW impacts that may be required.

*RJOC: The line type width depicted on the plans is not representative of the actual thickness of the erosion control in the field. The plans have been revised to depict a different line type that illustrates the true size of the erosion control measures. The limits of work have been revised, as necessary, and the temporary/permanent BVW impact calculations have been updated as reflected in Attachment #3 of this response letter.*

**BETA2: Comment addressed. A thinner line type has been used to depict erosion controls on the Project plans and proposed grade tie-ins no longer overlap with locations of erosion controls.**

- W6. The Project will require significant clearing and grubbing. Provide a phasing plan to supplement the erosion control plan that limits the total area of disturbance at the Site at a time. This plan should also include timing on environmentally sensitive activities including stream/BVW crossings (roadways and boardwalks), the wetland replication area, and the stream restoration area. In addition, all staging/stockpile areas should be staked in the field prior to advancing phases. The Commission could consider a Special Condition in the OOC requiring the Applicant achieve stabilization to the satisfaction of the Commission or their Agent prior to advancing phases.

*RJOC: Erosion and Sediment Control Plans (C-1C & C-1D) have been prepared to illustrate the construction phasing of the proposed site work. Additionally, a Construction Phasing Plan (C-1E)*

*has been prepared, and is included within the revised Plan Set, depicting the anticipated construction zones and sequences for the project.*

**BETA2: Comment partially addressed.** The Construction Phasing Plan (Sheet C-1E) does not indicate when the boardwalks will be constructed. Review of the Erosion and Sediment Control Plans, however, indicates that construction of the boardwalks, intermittent stream crossings, and wetland replication area will occur within Phase II of the Project.

The Commission could consider the following Special Conditions in the OOC:

- The wetland replication area and the stream daylighting efforts will be established and temporarily stabilized prior to constructing the adjacent roadway crossing over the intermittent stream (Intermittent Stream Crossing No.1) and prior to any other Resource Area alterations at the Site.
- Prior to the start of construction, a revised construction phasing plan that outlines the timing on environmentally sensitive activities including stream/BVW crossings (roadways and boardwalks), the wetland replication area, and the stream restoration will be provided to the Commission or its Agent for review and approval.

W7. In addition to a phasing plan for the entire Project, a construction sequence and plan specific to the proposed intermittent stream crossings should also be provided. This plan should include the following:

- a. Installation of erosion and sedimentation controls, and in water controls as appropriate;  
*RJOC: Phased erosion control plans for construction have been prepared on Sheets C-1A through C-1D and are included in the revised plan set. These plans provide sequencing for erosion control and construction.*

**BETA2: See BETA2 response to comment W5.a.**

- b. Points of access by machinery to construct the crossings; and  
*RJOC: The demolition and erosion control plans (C-1A and C-1B) have been revised to depict the use of construction swamp mats to be used at the crossings for access for clearing/grubbing of the site; Erosion and sediment control phase II plans (C-1C and C-1D) have been prepared depicting the details of the construction of the culverts at the crossings with cofferdams, pumps and filter bags (details have been provided on Sheets C-5 and C-6).*

**BETA2: Comment addressed.**

- c. Restoration of temporarily impacted LUW and Bank.  
*RJOC: Impacted areas of Bank will be restored to pre-existing conditions, i.e., the existing substrate will be restored to a natural state that are present prior to construction. The land between the Banks will also be restored to pre-existing conditions, which BETA is generally referring to as LUW.*

**BETA2: See BETA2 response to Comment W11 and W12.**

W8. It is recommended that all chain link fencing provide a minimum of a 4-inch bottom gap to facilitate wildlife movement for small species.

*RJOC: The Chain link fence detail on Sheet C-12 has been revised to include a note to provide a minimum of a 4-inch bottom gap under fencing to facilitate wildlife movement for small species.*

**BETA2: Comment addressed.**

- W9. To apprise the Conservation Commission of federal permitting requirements, the Project will be required to obtain U.S. Army Corps of Engineers (USACE) approval under the Section 404 Massachusetts General Permit prior to commencing construction.

*RJOC: The Applicant is aware of this requirement and will be submitting the appropriate documents to the USACE.*

**BETA2: Comment addressed.**

## MITIGATION COMMENTS

- W10. The "Existing Wetland Disturbance Exhibit" depicts areas of existing disturbed wetlands (12,485 sf) resulting from active mowing that will be restored as a part of the Project. A portion of the proposed restoration (as depicted by the Applicant) will be permanently impacted through construction of the clubhouse pool. Similarly, a portion of the proposed Boardwalk #2 is also within the proposed BVW restoration area. Revise the Exhibit and restoration totals accordingly or adjust the limits of work.

*RJOC: The proposed retaining wall adjacent to the clubhouse pool has been revised to avoid both temporary and permanent impacts to the wetland. The existing, disturbed wetland areas will be restored via tilling and seeding, and immediately covered with a straw mat for erosion and sediment control. The disturbed wetland areas to be restored at Boardwalk #2 will be seeded below the boardwalk for restoration, however there will be footings installed within this area that will have an overall impact of approximately 5 sf. Therefore, there will be an overall wetland restoration area of 12,480 sf.*

**BETA2: Comment addressed. The proposed retaining wall near the clubhouse pool has been reconfigured to avoid impact to the adjacent BVW. The wetland restoration area total has also been revised to exclude permanent BVW impact associated with installation of the boardwalk footings.**

- W11. BETA offers the following comments with regards to the wetland replication area and associated stream daylighting efforts:

- a. Provide a note on the Wetland Replication Plan (Sheet C-2C) stating that the Wetland Scientist will review the proposed wetland replication area for existing, native woody plants to retain and mark them in the field for preservation.

*RJOC: The suggested note has been added to Sheet C-2C as Note #1 under General Wetland Replication Notes.*

**BETA2: Comment addressed.**

- b. Provide a note requiring the Wetland Scientist to contact the Commission for review and approval of final grades and proposed planting stock prior to planting. This could be included as a Special Condition in the OOC.

*RJOC: The suggested note has been added to Sheet C-2C as Note #2 under General Wetland Replication Notes.*

**BETA2: Comment addressed.**

- c. BETA recommends that the wetland replication area and associated stream daylighting efforts be established and temporarily stabilized, at a minimum, prior to constructing the adjacent roadway crossing over the intermittent stream. Construction of the roadway and adjacent temporary drainage swale will severely limit access to the wetland replication area. This could be included as a Special Condition in the OOC.

*RJOC: Construction phasing proposed for the project calls for the area of the wetland replication area to be used as a temporary sediment basin. Upon stabilization of the site, the temporary sediment basin will be removed and at that time the wetland replication and associated stream daylighting efforts will occur. Performing the work for the wetland replication and associated stream daylighting efforts at this time would also limit the risks of any damage to these areas during overall site construction.*

**BETA2: Comment remains. To prevent unnecessary compaction of the soil in the location of the wetland replication area and to establish mitigation areas early on in the Project's schedule, BETA advises against use of this area as a temporary settling basin during project construction. As previously noted, access will be limited following the construction of the roadway and the adjacent drainage swale.**

- d. As part of the proposed wetland replication area, the Applicant proposes to daylight 180 linear feet (920 sf) of culverted stream; however, minimal details on sequencing and approach are provided. Provide information including the proposed profile of the streambed and the proposed bankfull width (and how these were determined), the proposed gradient of the stream, how the restored stream will tie into the existing BF2 Series streambed and Bank elevations, how the streambed and Banks will be stabilized (temporarily and permanently), and what type of substrate is proposed/how it was determined based on existing fluvial processes. Additional erosion controls will also be required to prevent sedimentation of the stream while the wetland replication area is being stabilized.

*RJOC: Construction sequencing for the existing drainpipe removal and intermittent stream construction has been provided on Sheet C-1C. Additionally, Sheet C-2C has been revised to include a profile of the stream bed, depicting the slope and tie in elevations to the adjacent wetlands and proposed culvert. The plan view on Sheet C-2C has been revised to depict compost sock erosion and sedimentation barriers be installed on either side of the proposed intermittent stream until the wetland replication area is stabilized. Bankfull Determination Exhibits have been prepared and are included in Attachment #4 of this response letter depicting how the bankfull widths were determined for the stream crossings. Notes have been added to the intermittent stream details on Sheet C-9 stating that the existing streambed soils will be removed and stockpiled separately for reuse in reestablishing the streambed.*

**BETA2: Comment partially addressed. Attachment 4 shows the locations where bankfull width measurements were taken in the field at the locations of Intermittent Stream Crossings No.1 and No.2, and the submitted profile depicts how the daylighted stream channel will tie into adjacent existing grades. However, information regarding how the streambed and Banks will be stabilized (temporarily and permanently) and the type/rationale for selection of the streambed substrate within the daylighted channel**

is still required. It is not anticipated that appropriate streambed material will be generated through the removal of the drain pipe to restore the daylighted portion of the stream channel. In addition, it is recommended that staked coir logs of an appropriate diameter be used to establish new Banks.

The Commission could consider including a Special Condition requiring a plan be submitted to the Commission or its Agent for approval prior to the construction of the wetland replication area and stream daylighting efforts which documents:

- A method for stabilization of the Banks associated with the stream daylighting efforts (i.e., coir logs and erosion control netting);
- Specific native seed mix proposed for use along the Bank; and
- Substrate proposed for the streambed.

W12. Provide a method for restoring temporary Bank and LUW impact areas and describe how Banks under the crossing will be graded and permanently stabilized and include notes pertaining to Resource Area restoration on the plan set.

*RJOC: The Banks and land between the Banks (LUW per BETA), will be graded per the revised plans, dressed with an appropriate substrate to match the existing substrate, and stabilized. The Banks will be stabilized via loaming and seeding, along with installation of an erosion control blanket and compost socks on the slopes if necessary (Details on Sheet C-6 and C-9).*

**BETA2: Comment resolved.**

W13. Discussion of alternatives to the southern stream crossing to access Building 1 references only one alternate location to the crossing as shown in the exhibit titled "Alternative Driveway Layout". This alternative does not take into consideration other configurations for Building 1 and associated amenities that would make a driveway to this Building from Grove Street feasible.

*RJOC: The applicant has consulted with the Project Traffic Engineer, Vanasse & Associates, Inc., and they have noted there are traffic-related concerns with adding a secondary driveway for Building 1. The concerns include:*

- *Access management guidelines indicate that if one driveway adequately services the Project demand, a second driveway should not be considered. Access principles dictate that conflicts at intersections and driveways should be separated and the number reduced as much as possible.*
- *There is a potential for conflict due to differentials in speeds of vehicles entering and existing the site. Vehicles exiting a secondary driveway for Building 1 would need to accelerate to get up to speed on Grove Street while vehicles intending to enter the Main Driveway would need to decelerate. Given the distance that would be proposed between the two driveways, there are likely to be conflicts which will cause a safety concern.*
- *Good practice for site development is to avoid a scenario that can be confusing for emergency response. Without central connectivity throughout the project, emergency response personnel and vehicles could inadvertently use the wrong driveway requiring them to exit to Grove Street and then re-enter the second driveway.*

**BETA2: Comment addressed. The Applicant has provided sufficient information to document that options to avoid and minimize impacts to BVW have been reviewed per 310 CMR 10.55(4)(b). BETA defers acceptance of the provided alternatives analysis to the Commission.**

W14. BETA offers the following comments on the Landscape Plans:

- a. The proposed area of wetland fill north of the clubhouse is not depicted as being planted or stabilized on the Landscape Plans. Provide plantings within this area, unless fill is avoided.

*RJOC: The plans have been revised accordingly.*

**BETA2: Comment addressed. Wetland fill is no longer proposed north of the clubhouse.**

- b. Areas of proposed lawn that do not appear to be necessary for public use/access (i.e., south of Building #2 along the parking area) should be vegetated with native, herbaceous species and mowed only once per year during late fall. BETA recommends a Special Condition requiring this mowing schedule for all areas where native, herbaceous species are established.

*RJOC: These areas are proposed as lawn by the Landscape Architect to allow for vehicle overhang over the curbing without resulting in degradation of higher growing ground species.*

**BETA2: The Applicant could explore the establishment of low-height, native vegetation within this area that would be compatible with the adjacent parking. Comment remains.**

- c. The proposed Russian sage (*Perovskia a.* "Little Spire") should be replaced with a native species.

*RJOC: The Russian sage has been removed and the plans have been revised accordingly.*

**BETA2: Comment addressed.**

- d. The Applicant proposes several cultivars in the planting plan. Cultivars alter the natural fruiting and flowering processes of plant species and oftentimes diminish their value to native wildlife. It is recommended that cultivars be removed from the plan and replaced with true native counterparts.

*RJOC: The cultivars have been removed and the plans have been revised accordingly.*

**BETA2: Comment addressed.**

W15. The Applicant proposes restoration of Buffer Zone and disturbed BVW within several areas across the Site. The narrative notes that seed should be applied to "clean bare soil" in Buffer Zone restoration areas and does not specify any details regarding the preparation of the BVW restoration areas. It is recommended that the Applicant clarify if full tillage is proposed in all restoration areas; if so, additional erosion controls should be provided at the downgradient limits of disturbance.

*RJOC: The applicant is proposing to till and seed the existing disturbed wetland areas. The areas will be covered with straw matting immediately after seeding for erosion and sediment control until stabilization occurs.*

**BETA2: Comment not addressed. Additional erosion controls have not been provided at the downgradient limits of disturbance. This will protect the adjacent, undisturbed BVW until vegetation is established within the restored areas.**

## **WPA PERFORMANCE STANDARDS COMMENTS**

The Project, according to the WPA Form 3, proposes 580 square feet of BVW impacts and 320 linear feet of Bank impacts. However, the narrative documents 585 sf of temporary and 580 sf of permanent (total 1,165 sf) impacts to BVW. Furthermore, the WPA Form 3 does not quantify any LUW impacts. The Applicant is required to quantify all temporary and permanent Resource Area impacts and demonstrate how the applicable Performance Standards are met.

The Project is also being filed under the Limited Project provisions at 310 CMR 10.53(3)(e) for the construction and maintenance of a new roadway or driveway and 310 CMR 10.53(3)(j) for the construction of the proposed boardwalk. The applicability of Limited Project provisions to the Project is at the sole discretion of the Commission based on the Applicant's efforts to provide an alternatives analysis and minimize impacts.

### **Bank (310 CMR 10.54)**

W16. Provide a narrative to demonstrate compliance with the Performance Standards at 310 CMR 10.54(4). Although the roadway crossings meeting the Stream Crossing Standards are presumed to meet the Bank Performance Standards, an assessment must be provided for the boardwalks regardless of potential Limited Project status.

*RJOC: A narrative has been provided to demonstrate the project's compliance with the performance standards under Section 310 CMR 10.54(4) of the WPA. The narrative includes a description of the construction of the proposed boardwalks and compliance with the performance standards for Inland Bank. See LE Response Letter #1 in Attachment 1 of this letter.*

**BETA2: Comment addressed. BETA defers to the Commission for approval of the Limited Project status.**

W17. The Applicant should provide further justification for the southern intermittent stream crossing as part of its review under the Limited Project provisions. The alternatives analysis does not consider the establishment of a secondary entrance/egress off Grove Street that avoids a steep roadway slope by redesigning the layout of this portion of the Site so that the proposed roadway could be located where Stormwater Basin 1 is currently proposed.

*RJOC: The applicant has consulted with the Project Traffic Engineer, Vanasse & Associates, Inc., and they have noted there are traffic-related concerns with adding a secondary driveway for Building 1. See Response to Comment W13.*

**BETA2: Comment addressed. See BETA2 response to Comment W13.**

### **Bordering Vegetated Wetland (310 CMR 10.55)**

W18. Provide depth to groundwater within the replication area to demonstrate that the proposed grading will result in Estimated Seasonal High Ground Water (ESHGW) levels occurring within 12 inches of the final surface elevation.

*RJOC: It is expected that the proposed elevations will result in ESHGW to be within 12 inches of final grade based upon existing grades and observations of the adjacent wetlands. The applicant*



*suggests that soil testing to verify ESHGW elevation be performed at the time of the installation of the temporary sediment basin in this area. If testing reveals that the ESHGW will not be within 12" of the final surface elevation, but only minor elevation modifications are necessary, then field adjustments will occur at the time of construction under the supervision of the Wetland Scientist and/or Civil Engineer (with notification to the Conservation Agent). If significant modifications are necessary, the area shall be redesigned by the Wetland Scientist and/or Civil Engineer and submitted to the Conservation Department for review.*

**BETA2: The Commission could consider a Special Conditions in the OOC that requires verification of ESHGW be provided to the Conservation Commission or its Agent prior to construction of the wetland replication area to confirm sufficient hydrology is present.**

- W19. The section view for the boardwalk on Sheet L301 references finished grade that will vary dependent on location. The Applicant should clarify that no grading will occur within BVW; if grading is proposed, quantify permanent impacts that are not only associated with shading. As previously noted, all temporary impacts associated with the construction of the boardwalk should also be quantified.

*RJOC: A note has been added to Sheet C-4B and to the boardwalk detail on Sheet L301 stating that "No grading within the Bordering Vegetated Wetland shall occur in association with the construction of the boardwalks."*

**BETA2: Comment addressed.**

- W20. The Applicant should provide justification for the permanent wetland impacts adjacent to the pool and clubhouse. The NOI narrative does not discuss the feasibility of adding angle points to the retaining wall and shifting stormwater infrastructure to avoid wetland impacts at this location.

*RJOC: The retaining wall layout in this area has been revised to avoid both temporary and permanent wetland impacts.*

**BETA2: Comment addressed.**

#### **Land Under Water (310 CMR 10.56)**

- W21. Disclose all temporary and permanent LUW impacts associated with the construction of the crossing. Based on BETA's knowledge of the Site, the intermittent streams at the locations of the proposed crossings flow for a significant portion of the year; accordingly, the mean low water level is above the thread of the stream and the streams have associated LUW.

*RJOC: LE disagrees with BETA's assessment that LUWW is present on the site and has prepared a narrative detailing our position. However, assuming LUWW were present at the site, the narrative includes a summary of temporary and permanent impacts to LUWW. See LE Response Letter #1 in Attachment 1.*

**BETA2: The boundary of LUW in the Act under 310 CMR 10.56(2)(c) is the mean annual low water level. As established by case law in the 2007 Final Decision *In the Matter of Hoosac Wind Project*, "...the location of mean annual low flow level in an intermittent stream would logically vary depending on the amount of time the streambed is in fact dry...These streams would have a mean annual low flow above the thread of the stream" (14 CEPR 139). This decision supports that although the onsite intermittent stream may be dry for a period of time each year, LUW is still present. Based on field observations, it appears that flow may be present throughout a majority of the year within the intermittent streams subject to the proposed crossings.**

In addition, the approval of specific delineated boundaries does not correspond with the presence or absence of LUW at the Site. Per Section C of the issued ORAD, "...This Order does not, however, determine the boundaries of any resource area or Buffer Zone to any resource area not specifically noted above, regardless of whether such boundaries are contained on the plans attached to this Order or to the Abbreviated Notice of Resource Area Delineation". This is further supported by language included in the attachment to the ORAD which states, "...This ORAD does not approve any other Wetland Resource Areas".

**Notwithstanding the above, the Applicant has provided sufficient details to disclose impacts to LUW and appears to meet the relevant Performance Standards. Comment addressed.**

W22. Provide a narrative demonstrating compliance with 310 CMR 10.56(4).

*RJOC: Assuming LUWW were present at the site, a narrative has been provided to demonstrate the project's compliance with the performance standards under Section 310 CMR 10.56(4) of the WPA. See LE Response Letter #1 in Attachment 1.*

**BETA2: Comment addressed.**

## STORMWATER MANAGEMENT REVIEW

The Project proposes to use a combination of 8 subsurface infiltration structures and 3 subsurface lined detention basins. The proposed detention basins are proposed below ESHGW and will require that ledge be removed to facilitate installation. Runoff from the surrounding impervious surfaces will be initially treated with proprietary separators. In addition, 3 stormwater basins are proposed to accept flows from either the subsurface detention basins or the subsurface infiltration structures prior to discharge. These 3 stormwater basins are located east of Building 2, east of Building 1, and between the clubhouse and Building #3. The Site is separated into 2 separate watersheds by 2 intermittent streams that flow from northwest to southeast across the site towards Grove Street, one of which discharges to a catch basin along Grove Street. A Zone II, which is tributary to 2 public water supply wells on the opposite side of Interstate 495, is present across the northeast corner of the Site adjacent to Grove Street.

The primary access into the Site is within the center of the parcel, southeast of Building #3, with 2 interior stream crossings proposed for roadway construction. These crossings will consist of 3-sided box culverts that measure 10 feet wide by 10 feet high. Streambed material will be maintained along the bottom of the culverts and approximately 4 feet of headroom will be provided at each culvert.

Topographic relief is present from west to east, towards Grove Street. Grades on site range from elevation 260 along Grove Street at the northeast corner of the parcel to elevation 372 at the northwest corner of the parcel. Due to the length of the buildings, there are proposed retaining walls along the outside of the paved areas around the buildings to allow for fills and cuts at each building. These walls range up to 16 feet in height at certain locations.

BETA offers the following general comments on stormwater management and Site design:

SW1. The base of the proposed retaining walls along western extent of each building will be far below existing grade and it is anticipated that blasting will be required to achieve this depth based on test pits logs within 25 feet of the BVW. As a result, significant groundwater inputs from the adjacent BVW are anticipated. There are no construction details provided for these walls; however, they are shown on the detail sheets as being segmented block walls.

Since the walls will allow free passage of water throughout a majority of the blocks, groundwater flow will impact the capability of the downgradient subsurface infiltration systems from functioning in accordance with the Standards. In addition, the Applicant should disclose the limits of work and potential BVW and groundwater impacts associated with the blasting (fracturing of bedrock).

*RJOC: Cross-section details of the walls in the earth cut areas have been provided on Sheet C-15. The grading at the rear of Building 1 has been revised to raise the parking area and reduce the cut in that area. The excavation for the installation of the wall will include a geosynthetic clay liner on the face of the cut slope prior to backfilling with the existing soil. The clay liner will extend below proposed finish grade a nominal distance as a means to restrict the flow of water through the wall. The earth cuts in these areas will be 8 to 10 feet maximum. Based on the available soil test pits the shallowest rock appears to be at or about the same depth or deeper. No significant blasting will be required that will fracture bedrock, and we do not anticipate any adverse impacts to groundwater.*

**BETA2: There is no test pit data provided behind Buildings No. 1 or 2 to support the assumption that no significant blasting will be required. A majority of the deeper test pits are located within the valley close to the wetlands edge, where these geologic conditions are expected. BETA does not believe that the clay liner will effectively eradicate all the groundwater issues at the subdrains behind the proposed walls. Other design options inside the 50-foot Buffer Zone behind Buildings No. 1 & 2 requiring less blasting, or no blasting, should be presented to the Commission to minimize the likelihood of hydrologic impacts the adjacent wetlands. Alternatively, the Applicant should provide credible data that supports that no blasting is required under the current design. In addition, BETA recommends that all subdrain outlets be identified and located to ensure that they do not discharge towards the proposed infiltration BMPs.**

- SW2. Several subsurface infiltration systems are within the 50-foot minimum setback from BVW per the Massachusetts Stormwater Handbook (the Handbook) including PSIS 4, 5, 7 & 8. These infiltration systems must be relocated to comply with the design requirements of the Handbook.

*RJOC: The infiltration systems have been relocated to provide a 50-foot minimum setback from BVW. (Note: the infiltration system adjacent to the clubhouse (PSIS-7) has been removed from the design).*

**BETA2: Comment addressed.**

- SW3. In accordance with Volume 2, Chapter 2 of the Handbook, all subsurface structures must have an appropriate number of observation wells to monitor the water surface elevation and serve as a sampling port. In addition, each must have an entry port to allow worker access for maintenance. Provide the required observation wells and entry ports.

*RJOC: Notes have been added to each of the subsurface chamber systems (infiltration and detention) details, on Sheets C-8 and C-9, stating that a minimum of 4 inspection ports shall be installed per system (to be set at 4 corners of each system). Additionally, a note has been added to each of the subsurface corrugated metal pipe infiltration system details, on Sheet C-8, stating to "provide observation manholes with 24-inch covers at all corners and inlet/outlet pipes". These observation ports and manholes will provide access for monitoring and cleaning of the systems.*

*Details have been provided, on the detail sheets of the revised plan set, for both the observation ports and access manholes.*

**BETA2: A detail for the observation risers is not shown. The access manhole detail on Sheet C-7 is specific to the pipe infiltration systems only. Show all proposed observation risers in the plan view.**

- SW4. Subsurface infiltration systems 1, 2, & 6 are located 5 to 15 feet upgradient of a stormwater basin. In each case, the water surface elevation in the basin during a rainfall event will be above the bottom of the subsurface infiltration system. This standing water is likely to raise groundwater levels above the bottom of the infiltration systems and restrict the ability of the systems to infiltrate. The Applicant should revise the design accordingly.

*RJOC: Stormwater basins downgrade of subsurface infiltration systems 2 and 6 have been eliminated and the stormwater calculations have been revised accordingly. Stormwater Basin-1 (SWB-1) has been reviewed and the peak stormwater elevation is below the nearby infiltration system. The peak elevation within SWB-1 is 289.85 in the 100-year design storm and the bottom of stone elevation of subsurface infiltration system-1 (PSIS-1) is 295.70, therefore a 5.85' separation is provided from peak SWB-1 elevation to bottom of stone elevation of PSIS-1. Therefore, the SWB-1 is still being proposed as part of the drainage design.*

**BETA2: Based on the detail for PSIS-1, the top of the system is above the proposed grade. The proposed elevations for PSIS-1 or the grades above the system should be modified to provide the cover needed for the pavement. Regardless, Stormwater Basin 1 will impact groundwater levels below PSIS-1. BETA recommends that a mounding analysis be conducted for PSIS-1 with the assumed groundwater level at the spillway crest of Stormwater Basin 1.**

- SW5. Subsurface infiltration systems 1, 2, 3, 4, 5, & 8 are all located approximately 5 feet from a proposed retaining wall. In each case, the grade at the base of the wall is either at or below the bottom of the proposed infiltration system. The proposed impervious barrier along the walls near the infiltration systems must, at a minimum, extend to the bottom of the walls, down to the lowest elevation at the base of the retaining wall to avoid breakout and circumventing the full infiltration/treatment process.

*RJOC: The infiltration systems have been relocated to provide greater separation from proposed retaining walls. Additionally, cross-section details have been provided on Sheet C-14 depicting that the impervious barriers shall extend to one-foot below the bottom of wall.*

**BETA2: Comment addressed; impervious barriers have been designed as recommended.**

- SW6. Provide monitoring wells and emergency low level outlets within all stormwater basins per the Handbook.

*RJOC: An emergency low level outlet has been provided in the surface stormwater basin (SWB-1), and a note has been added to the detail on Sheet C-7 stating that a monitoring well shall be installed. The proposed location of the monitoring well has been provided on Sheet C-2A.*

**BETA2: BETA recommends that the monitoring well be shown in plan view.**

- SW7. Based on the ESHGW elevation established by test pit 40, Stormwater Basin 1 is only 0.5 feet above groundwater, where a minimum of 2 feet is required. In addition, it has been designed as an Infiltration Basin and does not meet the minimum setback of 50 feet from BVW per the Handbook. The design should be revised accordingly.

*RJOC: An emergency low level outlet has been provided in the surface stormwater basin (SWB-1), and a note has been added to the detail on Sheet C-7 stating that a monitoring well shall be installed. The proposed location of the monitoring well has been provided on Sheet C-2A.*

**BETA2: The basin is no longer being used to meet Standards 3 & 4 and is only serving as a dry retention basin. The floor of the basin has been raised and will now be 2' above ESHGW. No further comments.**

- SW8. The discharges from PSDS 1 & 2 use a proprietary separator as terminal treatment for these treatment trains. In accordance with Volume 1, Chapter 1 of the Handbook, they cannot be used as terminal treatment and will require an alternative design.

*RJOC: The drainage system layouts have been revised such that a proprietary separator is not used as terminal treatment. Terminal treatment for all captured stormwater runoff is provided via infiltration. The required TSS removal is achieved.*

**BETA2: Comment addressed. The two subsurface detention basins each discharge through an infiltration BMP prior to discharge. No further comments.**

- SW9. The designer is assuming a total suspended solids (TSS) Removal Rate of 80% for all proprietary separators being used. According to Environmental Protection Agency (EPA) studies, these separators are only 40-45% effective. Generally, these systems proposed in Franklin have only been allowed for use as a final treatment in redevelopment situations where the existing stormwater collection system is being maintained. The TSS removal rate should only be 44% for all proprietary separators in the TSS removal calculations in the report.

*RJOC: The TSS calculations have been revised to use a removal rate of 44% for all proprietary separators and the resulting calculations reflect full compliance with the regulations.*

**BETA2: Based on the proposed use of the proprietary separators for pretreatment, all the proposed discharges will meet the requirement for 80% TSS removal required under the Standards. However, the total TSS Removal provided by the development will not be 92% as reported. A separate TSS removal calculation should be presented for each discharge point. The designer should also note that the required pretreatment cannot be used in the calculations for the total treatment provided by the train.**

- SW10. There are no hydrologic/hydraulic calculations provided for the 2 stream crossings. BETA recommends that this analysis be provided for review to ensure appropriate capacity and avoidance of potential issues related to scour, erosion, and flooding.

*RJOC: A hydrologic/hydraulic calculation has been provided for the 2 stream crossings and is included in Attachment # 5 of this response letter. The calculations illustrate that the culverts at the stream crossings are more than adequately sized to handle the upstream flows for the 100-year design storm (an exhibit has also been included in Attachment #5 depicting the limits of offsite tributary areas to the intermittent streams).*

**BETA2: Comment addressed.**

- SW11. CB-4 should be moved to the low point in the intersection to improve the angle into DMH-6.

*RJOC: CB-4 has been relocated accordingly.*

**BETA2: No further comments.**

SW12. The connection from CB-41 to DMH-29 is an acute angle which is opposite to the flow direction out of the manhole and should be corrected to a more obtuse angle.

*RJOC: The connection has been revised accordingly.*

**BETA2: Comment addressed.**

#### **MASSDEP STORMWATER STANDARDS**

The project is subject to the Massachusetts Stormwater Standards (310 CMR 10.05(6)(k-m)) as outlined by MassDEP. The Project's compliance with these Standards is outlined below:

**NO UNTREATED STORMWATER (STANDARD NUMBER 1):** *No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.* The Project proposes 7 new outfalls which will discharge stormwater runoff to the 2 intermittent streams that bisect the parcel. The runoff from the development around Building #1, Building #2, and the clubhouse area will flow into the proposed stormwater basins prior to discharge. These basins will function as infiltration basins; however, they provide no treatment benefits due to their proximity to BVW (i.e., within 50 feet). The final discharge location for these structures is within 25 feet of the BVW.

SW13. The stone sizing calculations for the riprap aprons were not included in Appendix B as noted in the legend.

*RJOC: Rip-Rap Apron Sizing Calculations have been provided within Appendix B of the revised stormwater report.*

**BETA2: The nomographs are provided; however, the D<sub>50</sub> for each of the outfalls was not plotted. Complete the analysis and document that the rip rap size proposed is within the design conditions for Figure 1 of the appendix.**

SW14. The impervious surface area tributary to DCB-50 exceeds ¼ of an acre and therefore does not conform with the design requirements in Volume 2, Chapter 2 of the Handbook.

*RJOC: The proposed grading in this area has been revised and an additional catch basin has been added upgradient to decrease the tributary area to that DCB.*

**BETA2: Comment addressed. However, it should be noted that in several instances the catch basins provided are CDS units which discharge directly to the infiltration BMP. In those instances, the TSS removal associated with the deep sump catch basin is not available to be used in the train.**

**POST-DEVELOPMENT PEAK DISCHARGE RATES (STANDARD NUMBER 2):** *Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.* The Project proposes an increase in impervious area and changes to existing hydrologic patterns. Stormwater runoff will be directed to 8 new subsurface infiltration structures, 3 subsurface detention basins, and 3 stormwater basins. Stormwater Basin 1 has been designed as an infiltration basin. Calculations indicate a decrease in peak discharge rate and runoff volume to all onsite watersheds as a result of the Project.

SW15. The time of concentration (T<sub>c</sub>) calculations for the existing conditions analysis are understated. As correctly noted in the report, T<sub>c</sub> should be based upon the longest **time** of travel, not necessarily the longest distance. BETA recommends that the Applicant reassess flow paths, especially for the initial sheet flow path and slope.

*RJOC: The Tc calculations for the existing conditions have been reviewed and minor adjustments have been made to the hydrologic analysis model within Appendix B of the revised stormwater report.*

**BETA2: BETA recommends that the designer review the paths again for the two existing watersheds towards DP-2 and DP-3. Compliance with Standard 2 is close and minor changes in the Tc could influence the design conclusion.**

- SW16. The use of curve number (CN) values associated with hydrologic soil group (HSG) D within the central portion of the Site should be limited to areas of BVW. Several of the test pits performed in this area indicate that soils are classified as HSG A.

*RJOC: The limits of designated HSGs used in the stormwater analysis are based upon the National Resources Conservation Services (NRCS) online web soil survey. These HSG designations provide estimates of runoff potential from the upper soils as described in the Massachusetts Stormwater Handbook Volume 3: Chapter 1, Page 13:*

*“For undisturbed soils in Massachusetts, NRCS has assigned each soil type to a Hydrologic Soil Group. However, that classification is based on the upper and not lower soil horizons.”*

*The onsite soil testing performed by RJOC, which yielded a Sand or Loamy Sand, HSG A soil, was required to determine the soil texture in the lower soil horizons (parent material) for infiltration system design. This does not represent the runoff potential from the upper soil horizons when calculating site hydrology. Therefore, the NRCS HSG designations, as depicted on the web soil survey, were used for determining the CN values for the analysis of stormwater runoff.*

**BETA2: The Ridgebury soils series are listed as HSG-C by Plymouth County. In addition, the description of the series by NRCS states that depth to dense till commonly is 36-49 cm and that “they normally occur in drainageways in uplands...”. Each of these descriptions fits the wetlands through the site and none of the test pits outside the limits of the wetlands confirm the presence of dense till. Comment remains.**

- SW17. The stormwater basins are all retention basins with only an emergency spillway, however there is no discussion regarding dewatering between events. BETA recommends that a positive means of dewatering be provided for these basins.

*RJOC: The drainage design has been revised to eliminate all surface stormwater basins, except for Stormwater Basin-1 (SWB-1). Calculations have been provided depicting that SWB-1 will drawdown within 72-hours, additionally an emergency drawdown outlet has been provided.*

*The locations of the formerly proposed surface stormwater basins are to be used for temporary sediment basins during construction (as depicted on Sheets C-1A through C1-D) but are to be removed/filled and the area revegetated after site stabilization. Final grading on Sheets C-2A and C-2B depict positive slopes away from outlets.*

**BETA2: Comment addressed. Based on the underlying soil beneath SWB-1, BETA agrees with the designer’s assessment.**

- SW18. There is no opportunity for maintenance for the subsurface detention systems. Since they are lined with no opportunity for infiltration, the storage volume is critical to their success in meeting this Standard. Although the flow into these systems is treated by proprietary separators, their limited capabilities based on the EPA’s analyses indicate that the sediment which flows through these systems from the pavement areas will impact overall storage capacity over time. BETA

recommends that the Applicant review the design and find alternative above-ground means of providing storage to attenuate peak flow rates, which can be effectively maintained long-term.

*RJOC: The subsurface detention systems will be maintained in the same manner as the subsurface infiltration systems, as noted in the O&M within Appendix E of the revised stormwater report. Monitoring of the systems for any sediment accumulation will be performed through the observation ports in the systems. As noted above, the flows are treated using deep sump catch basins and proprietary separators to remove 58% TSS prior to entering these systems. In the event there is sediment observed within the system of more than 3" of average depth, maintenance will occur through the observation ports. The maintenance is accomplished using a high-pressure water nozzle in an observation port to suspend the sediments and then the vacuuming of the water and sediments through an adjacent observation port to remove the sediments. Sewer and pipe maintenance companies have vacuum/Jet Vac combination vehicles to perform this maintenance.*

**BETA2: As documented by the EPA, the proprietary separators have difficulties with suspended solids which will tend to fill the voids in the stone. To ensure that the suspended solids do not impact the voids in the underlying stone, BETA recommends the use of a filter fabric wrap around the inlet row in the system. It is referred to as an "Isolator Row" by Storm Tech. This will ensure that the suspended solids remain in the first row and can be vacuumed as noted.**

**RECHARGE TO GROUNDWATER (STANDARD NUMBER 3):** *Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to maximum extent practicable.* NRCS soil maps indicate that soil in the area of proposed modifications is predominantly Charlton-Hollis-Rock Outcrop Complex with HSG A & B ratings depending on the slope. The center of the Site, which is coincidental with BVW complexes, is a Ridgebury Fine Sandy Loam with rating of HSG C/D. Test pits conducted at the Site by the Applicant indicate that the entire site is shallow to bedrock. Only 3 test pits (7, 42, & 43) achieved 10 feet of depth without encountering ledge, while all others encountered refusal from 6 to 9 feet in depth. The layer above the ledge varies from a loamy sand to a sand.

Recharge is proposed via 8 new subsurface infiltration systems and 1 infiltration basin, which will capture runoff from most of the proposed impervious surface areas. The proposed systems will provide a recharge volume in excess of what is required by the Standards per the Applicant's documentation. Drawdown calculations indicate that the subsurface basins will drain within 72 hours.

SW19. In accordance with the Handbook, 2 test pits are required within the footprint of each proposed infiltration system. Additional test pits are required within the footprint of 5 of the subsurface infiltration systems to meet this requirement.

*RJOC: After the reconfiguration of the drainage design noted previously, a minimum of 2 test pits are provided within the footprints or within reasonable proximity of all infiltration systems. For Stormwater Basin-1, PSIS-2 and PSIS-7 there has been extensive soil investigation in the area, as outlined below:*

- *PSIS-2: 1 test pit within the system and 3 additional within 50' of the system.*
- *PSIS-7: 1 test pit within the system and 2 additional within 15' of the system.*
- *SWB-1: 4 test pits within 30' of the bottom of the basin.*

*RJOC believes the soil testing performed in close proximity to each of these systems provide evidence that the soil types and groundwater elevations used in the design as accurate.*



**BETA2:** Based on the revised configuration of the infiltration BMPs, BETA agrees that no additional soil testing is required for the design. However, BETA offers the following regarding PSIS-3:

- The description for TP-7 states that ESHGW was established by the soil evaluator based on the depth to weeping. However, in TP-8, redoximorphic features were observed with no weeping visible. In each test pit, the C Horizon is described as sand. Due to the lack of redoximorphic features in TP-7, BETA recommends that a *Frimpter* adjustment be conducted for this ESHGW determination.

SW20. There are no calculations provided to verify the static storage volume provided in the subsurface systems. The stage-storage table for each system should be provided to verify the volumes shown in the appendix.

*RJOC: The stage-storage tables for each system have been provided within Appendix B of the revised stormwater report.*

**BETA2: Comment addressed.**

SW21. The overall impervious surface area at the Site should be developed to ensure that at least 65% of these surface areas are directed to an infiltration structure.

*RJOC: Calculations illustrating that at least 65% of the impervious surface area is being directed to the infiltration facilities are provided within Section 9.2 of the stormwater report.*

**BETA2: Comment addressed.**

**TOTAL SUSPENDED SOLIDS (STANDARD NUMBER 4):** For new development, stormwater management systems must be designed to remove 80% of the annual load of Total Suspended Solids (TSS). The Project will treat areas of pavement with deep sump catch basins, proprietary filters, and infiltration structures. As a Site with a rapid infiltration rate (>2.4 in/hr), the Project is required to treat the 1 inch water quality volume (WQV) and provide at least 44% TSS removal prior to discharge to an infiltration BMP.

SW22. The pretreatment cannot be included in the total treatment rate provided by the treatment train and must be isolated. The TSS Removal sheets should be modified appropriately including a separate sheet to identify the pretreatment provided.

*RJOC: The TSS removal sheets, in Appendix B of the revised stormwater report, have been updated accordingly and illustrate compliance with the removal requirements*

**BETA2: See SW8 above.**

**HIGHER POTENTIAL POLLUTANT LOADS (STANDARD NUMBER 5):** Stormwater discharges from Land Uses with Higher Potential Pollutant Loads (LUHPPLs) require the use of specific stormwater management BMPs. The project is not considered a LUHPPL - **standard not applicable.**

**CRITICAL AREAS (STANDARD NUMBER 6):** Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas. A portion of the Project is located within a critical area. These standards will be applicable to the development. – **standard met.**

**REDEVELOPMENT (STANDARD NUMBER 7):** Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. The project is not considered a redevelopment – **standard not applicable.**

**EROSION AND SEDIMENT CONTROLS (STANDARD NUMBER 8):** *Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.* Due to the Project proposing to disturb over 1 acre of land, the Applicant will be required to file a Notice of Intent with the EPA and develop a Stormwater Pollution Prevention Plan (SWPPP). Erosion control measures are depicted on the submitted plans including silt fencing, mulch socks, catch basin inlet protection, stabilized construction entrances, and temporary sedimentation basins.

SW23. BETA recommends that a draft SWPPP be submitted to the Commission for their review given the density of the Project, with specific phasing.

*RJOC: A draft SWPPP has been provided in Appendix D of the revised stormwater report.*

**BETA2: Comment addressed.**

SW24. The design indicates that swales with stone check dams will be used along the edge of the BVW. Based on the existing and proposed grades, the Applicant should depict the proposed grading of swales to ensure that they can be installed and be effective in protecting the BVW during the construction process.

*RJOC: The plans have been revised to provide proposed spot elevations along the temporary drainage swales on Sheets C-1A and C-1B which shows they can be installed as shown. As noted in the plans the location of erosion and sediment controls within the construction limits will be relocated as necessary during construction to protect the resource areas and surrounding undisturbed areas.*

**BETA2: Comment addressed.**

**OPERATIONS/MAINTENANCE PLAN (STANDARD NUMBER 9):** *A Long-Term Operation and Maintenance Plan shall be developed and implemented to ensure that stormwater management systems function as designed.* A Stormwater Operation and Maintenance (O&M) Manual was provided with the Stormwater Management Report.

SW25. Provide an annual budget for O&M.

*RJOC: An annual budget of \$15,000-\$20,000 has been provided within the O&M.*

**BETA2: Comment addressed.**

SW26. The O&M Plan should be signed by the Applicant.

*RJOC: The applicant has signed the O&M Plan.*

**BETA2: Comment addressed.**

SW27. The manufacturer's maintenance requirements for the proprietary separators should be included in the plan.

*RJOC: The manufacturer's maintenance requirements has been added to the O&M, in Appendix E of the revised stormwater report.*

**BETA2: Comment addressed.**

**ILLICIT DISCHARGES (STANDARD NUMBER 10):** *All illicit discharges to the stormwater management system are prohibited.* An Illicit Discharge Compliance Statement was provided with the submission.

SW28. The Illicit Discharge statement should be signed.

*RJOC: The applicant has signed the illicit discharge statement.*

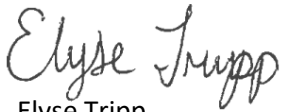
**BETA2: Comment addressed.**

## REVIEW SUMMARY

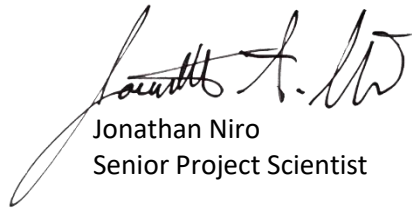
Based on our review of the NOI submittal and Project plans, the Applicant has not submitted sufficient information to describe the Site, the work, and the effects of the work on the interests of the Act. In addition, the Project does not presently comply with the Massachusetts Stormwater Management Regulations.

If we can be of any further assistance regarding this matter, please contact us at our office.

Very truly yours,  
BETA Group, Inc.



Elyse Tripp  
Scientist



Jonathan Niro  
Senior Project Scientist



Gary D. James, P.E.  
Senior Project Engineer

cc: Amy Love, Town Planner  
Bryan Taberner, AICP, Director of Planning & Community Development  
Matt Crowley, P.E., BETA

Attachments:

Attachment A: 2007 Final Decision *In the Matter of Hoosac Wind Project*

The parties to this proceeding are notified of their right to file a motion for reconsideration of this Decision, pursuant to 310 CMR 1.01(14)(d). The motion must be filed with the Docket Clerk and served on all parties within seven business days of the postmark date of this Decision. A person who has the right to seek judicial review may appeal this Decision to the Superior Court pursuant to M.G.L. c. 30A, §14(1). The complaint must be filed in the Court within thirty days of receipt of this Decision.

**SERVICE LIST**

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\* \* \* \* \*

In the Matter of HOOSAC WIND PROJECT (EnXco, Inc.)

Docket No. 2004-174  
 DALA Docket No. DEP -05-124  
 File No. 156-10  
 Florida

June 20, 2007  
 Arleen O'Donnell, Acting Commissioner

**Wetlands Appeal-Wind Turbine Project-Performance Standards for Inland Banks-BVW-Impairment of Inland Banks by Open Bottom Box Culverts-Failure to Perform Wildlife Habitat Study**—In a decision rejecting the key recommendations of Administrative Magistrate Natalie S. Monroe but praising her for a thorough and thoughtful decision, Acting Commissioner Arleen O'Donnell issued a Final Decision upholding a wetlands permit issued by the Department for a 20-turbine wind “farm” in the Hoosac Mountain Range, including four miles of access roads with multiple stream crossings, finding that the Applicant did adequately delineate the boundaries of the inland banks of the intermittent streams in accordance with Department recommendations, that the proposed work would not impair the stability of the inland banks, and that the Applicant was not required to perform a wildlife-habitat evaluation because work near the bank as proposed for the open-bottom culverts was not governed by the cited performance standards for banks. The Acting Commissioner added a condition to the Final Order of Conditions requiring the Applicant to specifically report on the condition of the inland banks within the open-bottom stream crossings consistent with the best- management practices identified in the Massachusetts River and Stream Crossing Standards.

**FINAL DECISION**

In this appeal, two citizen groups challenge the wetlands permit issued to enXco, Inc. to construct gravel access roads for a wind farm in the Town of Florida in the Berkshires. The case before the Department is limited to the project’s compliance with the Wetlands Protection Act, and does not, in any way, concern wind turbines or alternative energy. After a lengthy hearing, an Administrative Magistrate recommended that the permit be vacated. More specifically, the Administrative Magistrate concluded that enXco did not properly delineate the banks of twelve intermittent streams that would be crossed by the access roads, that the proposed open-bottom culverts did not meet the performance standards for inland bank, and that a wildlife habitat evaluation was not performed as required for the inland bank alteration [14 DEPR 66].<sup>1</sup> After careful evaluation of the Petitioners’ claims and the Recommended Final Decision, I have concluded that this project meets the requirements of the wetlands protection regulations.

I have reviewed this project within the context of recent guidance by the Department on stream crossings and wildlife habitat protection. The Massachusetts Stream Crossing Standards strongly endorse the use of open bottom culverts as a preferred alternative to traditional closed culverts.<sup>2</sup> The Petitioners claim that the

attributable to upland activities. In addition, the Concord Natural Resources Commission was correct that the wetlands regulations are not designed to provide a remedy for neighborhood flooding issues. See *Matter of The Villages at Goddard Highlands Realty Trust*, Docket No. 2003-116, Final Decision, July 25, 2006 [13 DEPR 212].

1. The Recommended Final Decision, at eighty pages in length, is both thorough and thoughtful. Administrative Magistrate Natalie S. Monroe carefully described the claims of the parties and their evidence, and provided detailed findings of fact for all issues in either the Recommended Final Decision dated May 14, 2007 or a prior Ruling on Motion for Partial Directed Decision dated March 7, 2007.

2. *Massachusetts River and Stream Crossing Standards*, developed by the River and Stream Continuity Partnership, dated March 1, 2006, adopted for use by the Army Corps of Engineers Programmatic General Permit for Massachusetts under Section 404 of the federal Clean Water Act, January 2005, originally pub-

plants growing on the inland banks will be shaded and die beneath the crossings, and this plant mortality will destabilize the banks.<sup>3</sup> The Standards do not preclude the use of open bottom culverts where banks are vegetated, and I find no scientific or regulatory basis for excluding their use for these intermittent streams, where the banks may or may not be vegetated. The Standards do recommend monitoring a stream crossing after construction. The Department's superseding order of conditions already includes a requirement that the applicant retain a compliance monitor to oversee the work at the site, a wetlands scientist to oversee the replication of bordering vegetated wetlands, and the submission of annual reports on the stability of the roadway, the functioning of the stormwater management system, and the ecological status of all resource areas. I will clarify the reporting condition already included in the permit to include the best management practices for monitoring for open bottom culverts identified in the Stream Crossing Standards. I will also allow the applicant to substitute an open-bottom culvert for a closed culvert at an additional stream crossing location.<sup>4</sup>

### Background

The notice of intent for this project was filed in 2003, followed by issuance of a local order by the Florida Conservation Commission, a request for and issuance of a superseding order by the Department's regional office and this appeal by the Petitioner on November 22, 2004, and most recently the Recommended Final Decision on May 14, 2007.<sup>5</sup> During this time period, the applicant proposed revisions to the project from the original plans which used traditional culverts for the stream crossings to the in-

corporation of open bottom crossings.<sup>6</sup> During this same time period but outside the context of this adjudication, the Department engaged in policy and regulatory development that led to the formal adoption of guidelines for stream crossings,<sup>7</sup> wildlife habitat protection guidance,<sup>8</sup> and narrative standards for work in the buffer zone of resource areas.<sup>9</sup>

In reviewing the record, I attribute some of the lack of clarity in the testimony, duly noted by the Administrative Magistrate, to ambiguity in the absence of standards to be applied to the revised proposal for the crossings.<sup>10</sup> The typical stream crossing project has involved the installation of properly sized culverts that simply eliminate the natural bank and replace it with the concrete or metal walls of the culvert. The Massachusetts River and Stream Crossing Standards were developed in response to concern about disruption of river and stream continuity from the destruction of natural banks by traditional closed culvert structures. See Massachusetts River and Stream Crossing Standards, para. 1.<sup>11</sup>

These Standards recommend open bottom crossing structures, as proposed by the applicant, as an alternative to closed culverts which had been initially planned. The Standards provide details on proper design and construction best management practices, and are appropriate guidelines for the development of plans for restoration or replication of altered habitat under the Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands and incorporated therein. See Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands, Department of Environmental Protection, March 2006, p. 16 and Appendix E. The

lished as technical guidelines on August 6, 2004. These Standards were developed under the regulations effective on November 13, 2003, the date the notice of intent for this project was filed. Although the Stream Crossing Standards are relatively new, the Department began to require spans for crossing of streams and vegetated wetlands associated with Outstanding Resource Waters in its 401 Water Quality Certification regulations in 1995. 314 CMR 9.06(3). Thus, the Department has many years of experience with similar stream crossing designs without reports of stream instability or other negative impacts of concern to the Petitioners. An agency may use its experience, technical competence, and specialized knowledge in the evaluation of the evidence presented. M.G.L. c. 30A, s. 11.

3. Every use of the terms "inland bank" or "bank" in this Decision refers to the resource area identified in 310 CMR 10.54, and not to the more general area where one might walk along a river or stream.

4. This condition is consistent with the Department's Administrative Appeals Policy for the Review of Project Plan Changes, DWW Policy 91-1, Issued February 8, 1991, Rev'd March 1, 1995, because it does not significantly revise the plan configuration and will result in reduced environmental impact.

5. A group of twelve residents initiated the appeal and a group of more than ten citizens moved to intervene pursuant to M.G.L. c. 30A, s. 10A (collectively, "the Petitioners"). A request by the applicant to expedite the appeal was granted, on the grounds that the project provides a significant environmental benefit. Although a grant of expedited status is intended to move a case to resolution more quickly, it implies no prejudgment of the merits.

6. Two streams (12 and 15) would remain crossed by closed culverts and the other ten streams (1,2,3,5,8,9,10,13, and 39) would be crossed by aluminum open-bottom structures. An "open bottom arch" is defined in the Massachusetts River and Stream Crossing Standards, Glossary, as "arched crossing structures that span all or part of the stream bed, typically constructed on buried footings and without a bottom." Thus, open-bottom arches cross a stream without touching either the stream or its banks. Culverts are defined as "round, elliptical or

rectangular structures that are fully enclosed (contain a bottom) designed primarily for channeling water beneath a road, railroad or highway." Based upon these definitions, the terms "open bottom crossing" or "open bottom culvert" used throughout the Recommended Decision refer to an "open bottom arch" in the new Standards. The construction of driveways and roads frequently requires some type of structure to allow passage of water underneath and the installation of culverts has been a relatively routine project in wetlands permitting.

7. *Massachusetts River and Stream Crossing Standards*, developed by the River and Stream Continuity Partnership, dated March 1, 2006, adopted for use by the Army Corps of Engineers Programmatic General Permit for Massachusetts under Section 404 of the federal Clean Water Act, January 2005.

8. *Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands*, Department of Environmental Protection, March 2006. I note that I am one of the principal authors of this document.

9. 310 CMR 10.53(1)rev'd March 2005. Unless specifically noted, all other citations to 310 CMR 10.00 refer to the regulations in effect on November 13, 2003 when the notice of intent for this project was filed.

10. The Department is sometimes criticized, justifiably, for shortcomings in the clarity of its regulatory standards. This case is an example of how a new methodology may be proposed before the appropriate guidelines are in place, complicating the respective tasks of the applicant, conservation commission, Department staff, the Petitioners, and the Administrative Magistrate.

11. Despite its authority to announce new standards in adjudication, the Department has not typically applied new regulation or policy to previously filed applications. See *Brookline v. Comm'r. of DEQE*, 387 Mass. 372, 379 (1982); 310 CMR 10.10. I am reviewing this project within the context of the Stream Crossing Standards because they are helpful to me in evaluating the proposed work and because the Petitioners essentially challenge Department policy. The Standards are not prescriptive, and I do not intend to imply that all applicants must meet the Standards for all crossings where the application was filed prior to the issuance of this guidance or where site-specific circumstances may preclude their use.

Wildlife Habitat Guidance also clarifies the jurisdiction of work in the buffer zone that may alter a resource area, in the context of wildlife habitat. *Id.* at Section G, Buffer Zones, p. 8.

Although enXco's revision of the plans to incorporate open bottom crossings was greeted with skepticism by the Petitioners as a means to impermissibly circumvent regulatory requirements, I have reviewed these guidances and the underlying regulations in considerable detail and do not share that view.<sup>12</sup> While the project proponent may have shifted to open bottom crossings in part to avoid the difficulties inherent in compensating for impacts of closed culverts, I conclude that the Department has embraced open bottom structures that leave the natural bank in place. Traditional closed culverts are not only challenging for wildlife, but can cause instability of the bank downstream because the smooth concrete or metal sides of the closed culvert result in much faster velocity that leads to erosion downstream.<sup>13</sup> I do not agree with the Petitioners that the presence of vegetation, and the potential for some plant mortality, makes an otherwise environmentally benign open-bottom culvert unacceptable and instead requires a traditional closed culvert which would have the perverse result of destroying the banks altogether. *See* Prefiled Direct Testimony of Pamela B. Weatherbee at para. 15-16.<sup>14</sup> The regulations support the use of open-bottom structures, and although I have been informed by the recent guidance documents of the Department, my Decision is firmly rooted in the regulations.

The Petitioners claim that, when properly delineated, there is vegetation on a narrow band on the banks of the intermittent streams that will be shaded after installation of open bottom culverts, altering the banks within the meaning of the regulations. The installation of traditional closed culverts coupled with a wildlife habitat evaluation, as originally proposed, would appear to address their concerns. Ironically, a wildlife habitat evaluation finding of an adverse effect would likely result in mitigation through the use of the open bottom culvert design that has been the subject of this dispute.<sup>15</sup> *See* Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands, Department of Environmental Protection, March 2006, p. 16 and Appendix E. Petitioners question whether the use of open bottom culverts is appropriate in small watersheds. Prefiled Rebuttal Testimony of Ed

Stockman at para.27. While not addressing specifically the relative merits of culvert designs, research on hydrological connectivity and the contribution of stream headwaters to ecological integrity suggests that headwater streams are worthy of an ecological crossing design.<sup>16</sup> This research is consistent with the Department's policy objective in the Massachusetts River and Stream Crossing Standards and the policy underlying this Final Decision.

In this Final Decision, I review the evidence on the issues for adjudication, beginning with the three issues related to inland bank that were the focus of the Recommended Final Decision, review the other issues related to bordering vegetated wetland replication and stormwater management, and finally comment on some procedural aspects of the case. I adopt in part and reject in part the Recommended Final Decision of the Administrative Magistrate. Although the Administrative Magistrate is quite correct that the burden of proof rests squarely upon the applicant in a wetlands case, 310 CMR 10.03(1), the applicant here relied upon the advice of Department staff as to the delineation of the inland bank and the acceptability of open-bottom structures prior to the formal adoption by the Department of this stream crossing technique.<sup>17</sup> While I have closely considered the evidence presented in this case, I am mindful that the conclusions I reach will affect other cases that involve stream crossings.

In addition to clarifying the condition on monitoring of the open-bottom crossings, I have added a condition to the final order of conditions that would allow the applicant to substitute the closed culvert currently proposed for Stream 15 with an open-bottom culvert, provided that the design meets the specifications for a minimum span of 1.2 times the bankfull width of the stream according to a revised plan submitted to the Department and Department staff has field verified that the structure will be located within the buffer zone only. I have not required this substitution because the applicant's engineer referred to a gradient restriction at this location, so this design may be precluded from an engineering perspective. *See* Prefiled Direct Testimony of Jason Krzanowski at para. 23. I have not recommended an

12. Applicants, in fact, are encouraged to design or to redesign their projects so that they do not exceed regulatory requirements. For example, an applicant proposing closed culverts must generally comply with the Department's 401 Water Quality Certification regulations at 314 CMR 9.00, as well as Section 404 of the Clean Water Act administered by the Army Corps of Engineers. By reducing the impacts, a permit under that program is no longer necessary. 314 CMR 9.00 requires the use of spans to avoid fill in wetlands or streams that are Outstanding Resource Waters. The open-bottom crossing design that the applicant adopted for the project is an example of a span that avoids wetland impacts.

13. Velocity in a stream depends on the depth and slope and inversely on the resistance of the boundary. In engineering, this resistance is called the Manning roughness coefficient. To illustrate, the coefficient for smooth concrete is 0.012 and the coefficient for a mountain stream is .040-0.050, or approximately four times more resistant than man-made materials. Dunn and Leopold, *Water in Environmental Planning*, W.H. Freeman and Company, 1978, p. 592-593.

14. Ms. Weatherbee is a highly qualified botanist, the author of "Flora of Berkshire County, Massachusetts," and although I differ on the question of plant mortality and bank stability related to the open-bottom crossing structures, I credit her identification of plant species in every respect.

15. I note that, with the exception of a population of large-leaved goldenrod which as a plant is not covered by the Wetlands Protection Act and was addressed by a conservation permit under the Massachusetts Endangered Species Act, the wildlife species identified at this site are quite limited: mice, voles, shrews and salamanders. Prefiled Rebuttal testimony of Ed Stockman at para. 25.

16. *See, e.g.,* recent research published in the Journal of the American Water Resources Association (Vol. 43, No. 1, February 2007) and cited by the U.S. Environmental Protection Agency and U.S. Army Corps of Engineers in guidance released June 5, 2007 entitled "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States*. *See* [www.epa.gov/owow/wetlands/guidance/CWAwaters.html](http://www.epa.gov/owow/wetlands/guidance/CWAwaters.html). The Stream Crossing Standards are also used under the Army Corps of Engineers 404 program for Massachusetts, so the Department closely follows federal activities related to wetlands.

17. The Department also bears responsibility for some ambiguity in regulatory interpretation of the delineation of upper boundary of bank and thresholds for wildlife habitat evaluation by not including these issues in more recent guidance.

open-bottom crossing of Stream 12 along Tilda Hill Road due to the presence of bordering vegetated wetlands and access constraints during construction.

#### Delineation of Inland Bank - Upper Boundary

The issue of whether the banks were properly delineated at the site received much attention, despite the understanding by the Petitioners that the open-bottom culverts would not be placed on this resource area. Prefiled Direct Testimony of Pamela B. Weatherbee at para. 15 (“Open-bottom culverts are considered to be the most benign environmentally in spanning small waterways. They do not physically touch the bank—and the bottom of the stream is left in its original state.”) Although the record is not clear as to the precise dimensions or orientation of the inland bank to which the witnesses were referring, it is certainly a small area. Prefiled Direct Testimony of Pamela B. Weatherbee at para. 19 (“[t]his Inland Bank Resource Area as delineated here is a very narrow space, perhaps inches or a foot wide.”). The dispute centered, then, not on the presence or absence of work on the inland bank but on the presence or absence of vegetation within this narrow area.<sup>18</sup>

The Department reviewed the delineation of Bank to determine whether the work would, in fact, be limited to the buffer zone. For these purposes, a precise delineation is not essential. Although I have resolved the question of terminology in determining the upper boundary of Bank, the differences between the various methodologies for delineation are not significant for review of this work which is limited to the buffer zone.<sup>19</sup> The differences in delineations were so strongly contested by the Petitioners because a higher upper boundary of inland bank could increase the amount of vegetation within the resource area. Even showing that there is at least some vegetation on some inland bank, the Pe-

tioners have not shown that work in the buffer zone will cause a measurable change in the stability of the banks to protect the interests of the Act.

A Bank for purposes of the wetlands regulation is the area which confines a water body, and does not include the land along a water body which is subject to flooding. 310 CMR 10.54(2) and 10.56(2). The wetlands regulations identify the upper boundary, or landward edge, of a bank as the first observable break in slope or the mean annual flood level, whichever is lower. 310 CMR 10.54(2)(c). The first break in slope is visually observed, while the regulations are silent on how to determine the mean annual flood level. The lower boundary of Bank is the mean annual low flow level. 310 CMR 10.54(2)(c). Neither mean annual flood level or mean annual low flow level is a defined term in the regulations. The term “mean annual high water line” for purposes of determining the boundary of the riverfront resource area was added to the regulations in 1997 after passage of the Rivers Protection Act with a narrative definition later refined in 2000 to incorporate the concept of a “bankfull” discharge and “bankfull field indicators” which can be visually observed.<sup>20</sup> The Massachusetts River and Stream Crossing Standards also use the term “bankfull width.”

The parties relied upon their own observations in the field, photographs taken at the site, and upon the supplemental submittal of the applicant identified in the record as Exhibit 1-1. See Prefiled Direct Testimony of Pamela B. Weatherbee, Attachment C, Exhibit 1-1, Data from Woodlot Alternatives. This submittal, which had been requested by the Department prior to issuance of its superseding order of conditions, includes descriptive materials based upon the Cowardin classification system, a well-accepted methodology for describing wetlands habitat.<sup>21</sup> Based upon the Department staff’s assessment that the mean annual flood level was typically lower than the first observable break in slope in this area, enXco’s consultant placed flags in the field at what was var-

18. The parties agree that there is at least some vegetation on at least some of the Banks. See, e.g., Prefiled Testimony of Gary R. Sanford at para. 34 (“Stream crossings #3, #7, #13, #39, #8 do not support significant vegetation.”). I infer that at a minimum stream crossings #1, #2, #5, #9, and #10 do have some vegetation.

19. I address in another section of this Decision the reliance by the Petitioners on cross-examination rather than direct testimony to raise the question of this technical term. I note that both the Applicant and the Department objected to the introduction of this question by means of the Leopold treatise. I have turned to Leopold for information on this issue in an attempt to evaluate the somewhat confused testimony resulting from the lack of foundation.

20. The mean annual high water line, used to delineate the riverfront area, is defined as “the line that is apparent from visible markings or changes in the character of soils or vegetation due to the prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land.” 310 CMR 10.58(2).

21. The submittal by the applicant for each stream using the Cowardin classification system conveys quite specific information about each stream. These wetlands were all classified as within the “Riverine System,” or habitat contained within a channel and bounded on the landward side by upland, the channel bank, or wetland. The channel bank is defined as the sloping land bordering a channel. “Intermittent” is one of four subsystems within the Riverine System, and applies to streams where the channel contains flowing water for only part of the year. The class “streambed” is restricted to the channels of intermittent streams and includes all wetlands within the Intermittent Subsystem of the Riverine System. The substrate (the surface on which a plant or animal grows) of streambeds varies

according to channel gradient, discharge velocity, and sediment load. Streambeds are usually not vegetated due to scouring by flowing water, but may be colonized by plants during low or interrupted flow or have scattered perennial emergent vegetation. Three subclasses are listed for these streams. “Rubble” is characterized by stones, boulders, and bedrock that together cover at least 75% of the channel. “Cobble-gravel” has a substrate of at least 25% unconsolidated particles smaller than stones with a predominance of cobbles or gravel (a “stone” is between 10 and 24 inches). The “Sand” subclass has sand-sized particles predominant among particles smaller than stones. “Vegetated” streambeds lack water long enough to be colonized by annuals or seedling perennials, but the vegetation is usually killed by rising water levels. There are two water regime modifiers for the streams at this site. “Intermittently flooded” means that the substrate is usually exposed but surface water is present for varying periods, not necessarily seasonally. “Seasonally flooded” means that surface water is present for extended periods particularly early in the growing season but then is absent toward the end of the growing season in most years. Cowardin, L.M., V. Carter, F.C. Golet, & E.T. LaRoe, *Classification of Wetlands and Deepwater Habitats of the United States*, U.S. Department of the Interior, Fish and Wildlife Service, Washington D.C., 1979. All streams at the site were identified as System: Riverine, Subsystem: Intermittent, Class: Streambed. The subclass “Cobble-gravel” was identified for Streams 1, 2, and 13. The subclass “Rubble” was identified for Streams 5, 7, 8, and 10. The subclass “Sand” was identified for Stream 3, 15 and 39. The subclass “Vegetated” was identified for Stream 9 and 12. The Water Regime “Intermittently flooded” was identified for Streams 5, 8, 10, 12, 13 The Water Regime “Seasonally flooded” was identified for stream 1, 2, 3, 7, 9, 15 and 39.

iously described as mean annual flood level, “bankfull conditions,” and ordinary high water. The Administrative Magistrate faulted enXco for flagging the inland bank according to these instructions and was persuaded that the flags had been improperly placed lower than the mean annual flood level. Recommended Final Decision at 28.

During cross-examination, Petitioner’s attorney correctly quoted a technical definition from a hydrology treatise: the “mean annual flood” is the arithmetic average of the highest momentary peak of annual flood discharges; it has a recurrence interval of 2.3 years. Leopold, Luna B., *A View From the River*, Harvard University Press, 1994, p. 117. See, e.g., Transcript Vol. 9 at pp 44-53.<sup>22</sup> Flood frequency is stated in recurrence intervals, a statistical parameter that describes the probable interval in years between floods of a specified magnitude.<sup>23</sup> It is greater than a bankfull discharge, which has an average recurrence interval of 1.5 years, and represents the most probable annual flood.<sup>24</sup> *Id.*, at 129. Importantly, the “mean annual flood” used in this technical sense is a discharge without any field indicators. It does not appear to have either a statistical or a physical relationship to the inland bank as the resource area which confines a water body within the context of these intermittent streams.<sup>25</sup>

The technical term “ordinary high water mark” used by the Corps of Engineers and other federal resource agencies “means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.” 33 CFR 328.3(e). Similar to the upper boundary of bank under the state wetlands regulations, the federal ordinary high water serves to distinguish between the water body and adjacent wetlands. 33 CFR 328.4(c). The notation “OHW” on enXco’s blue flags indicates that this term was used

by their consultant as synonymous with mean annual flood level. Testimony of Jeff Simmons, Transcript Vol. 7 at pp. 191-192. Apparently accepting the definition in the Leopold treatise of mean annual flood as instantaneous peaks and a review of federal case law indicating ordinary high water excludes peak flows, the Administrative Magistrate concluded that the federal concept of ordinary high water is necessarily lower than the mean annual flood level under the wetlands regulations. Recommended Final Decision at 32.<sup>26</sup>

The Department’s staff David Foulis used the term “mean annual flood level” to mean a flood that occurs on average every year. Testimony of David Foulis, Transcript Vol. 9 at pp.16-17. He believed that the mean annual flood so determined at these streams would fall below the first observable break in slope because they are entrenched, meaning that they have relatively confining banks and no flood plain. In fact, there is no evidence that these streams have any floodplain, nor is there any evidence that flood flows exceed the capacity of the channel. In ordinary usage mean annual flood level suggests an average of the levels in a stream that occur every year during flood stages, or an event that occurs on average annually.<sup>27</sup> The only graphic depiction of Bank produced by the Department that I am aware of appears in “Clearwater Estates,” a guidebook on the wetlands review process published by the Department in 1987. The graphic shows the bank resource area with the notation “Mean Annual Flood (1 Year).” Department of Environmental Quality Engineering, *Clearwater Estates, Part I*, 1987 Ed.<sup>28</sup> I conclude from this notation that the Department understood the mean annual flood level to be the one-year event. Further as the term “mean annual flood level” is not defined in the regulations indicating a technical usage, it should be given its ordinary meaning. *Warcewicz v. Department of Environmental Protection*, 410 Mass. 548 (1991).

Department staff determined that the mean annual flood level could be determined in the field by looking for signs of bankfull

22. Luna Leopold, as the former Chief Hydrologist for the United States Geological Survey, is unquestionably an eminent source. I address in a later section the introduction of this treatise and the technical definition of mean annual flood through cross-examination rather than through direct testimony with appropriate foundation for its use in this context.

23. The analytical procedure is the sequential ranking by magnitude of the highest discharges for each year of record. The equation is  $RI=(n+1)/r$  where n is the number of years of record and r is the rank. An alternate method used when the record is incomplete uses all discharges above a specified magnitude. Leopold, Luna B., *A View From the River*, Harvard University Press, 1994, p. 114-117.

24. A recurrence interval of 1.5 means that one year out of 1.5 years, or two out of three years, the highest discharge during a year will be equal to or exceed the capacity of the bank. Leopold and Dunne, *Water in Environmental Planning*, W.H. Freeman and Company, 1978, p. 315. Recurrence intervals for bankfull at 1.5 years and mean annual flood at 2.33 years are national averages and do not necessarily reflect conditions at this site or even Massachusetts.

25. In other words, even were the Mean Annual Flood as statistical instantaneous peaks with a 2.33 year recurrence interval to be used at these intermittent streams, it would theoretically be located higher on the bank than a 1.5 year recurrence but necessarily higher than the first observable break in slope.

26. The Administrative Magistrate found the applicant’s witness, Jeff Simmons, not qualified to present testimony on the mean annual flood level under the Wetlands regulations and not a credible witness. For purposes of the issue of delineation of Bank, I have not relied upon his testimony. See *Vinal v. Contributory Retirement Board*, 13 Mass. App. Ct. 85 (1982). I do believe that much of the

perceived inconsistency in his testimony is attributable to lack of precision in use of term for mean annual flood and the assumption by the Administrative Magistrate that the Petitioner’s definition was used under the wetlands regulations. I did rely upon the testimony of David Foulis because I believe there is support in the record for his conclusions as to the nature of the banks at the site. The emphasis at the hearing was on the photographs in Exhibit 1-1, submitted by Woodlot Alternatives in respond to the Department’s request prior to issuance of the superseding order. Although the Administrative Magistrate evaluated the testimony related to the photographs that were presented again at the hearing, Mr. Foulis testified that the hydrologic information in the Cowardin classification system and hydrologic descriptions were as or more useful to him. Transcript Vol. 9 at p. 129-134. Rather than conduct a site visit over the entire four mile length of the proposed access and ridge roads, Mr. Foulis relied upon a more limited site visit, supplemental submittals of descriptive materials including a well-accepted methodology for classifying wetlands, and several photographs for each stream crossing location. The superseding order also includes a prohibition on work on the bank and a compliance monitor to ensure that this condition is respected. Although I would prefer that Department staff were able to visit proposed sites and oversee ongoing work near wetlands, the Department’s limited resources have increased reliance on submittals and technology.

27. If the Department later determines that the technical term “mean annual flood level” or some other technical term is appropriate, it should propose a revision to the regulations that includes a definition and a methodology to locate this boundary in the field.

28. The agency name has been changed. The document continued to be used and is currently undergoing revisions.



conditions, used to approximate the average annual flood level which he had determined to be within the channel because there was no indication that the flood flows overtopped the channel walls.<sup>29</sup>

Although perhaps arrived upon for different purposes, the indicators used for locating bankfull conditions appear to be consistent between regulatory schemes. Bankfull field indicators for the riverfront area include changes in slope, changes in vegetation, stain lines, top of point bars, changes in bank materials, or bank undercuts. 310 CMR 10.58(2)(a)2. The Massachusetts River and Stream Crossing Standards also rely on "bankfull width," and define bankfull as "a geometric parameter that corresponds with the amount of water that just fills the stream channel and where additional water would result in a rapid widening of the stream or overflow into the floodplain." Indicators are identified as abrupt transition from bank to floodplain, top of pointbars, bank undercuts, changes in bank material, and change in vegetation. Massachusetts River and Stream Crossing Standards, Glossary. The vigorous difference of opinion of the witnesses over whether the banks were or were not vegetated tended to obscure the lack of any expert opinion testimony on the differences, if any, between the field indicators.

As noted above, the bankfull discharge for stream has a recurrence interval based on the annual flood analytical method of 1.5 years and represents the most probable annual flood. This recurrence interval equates on a record of the average frequency of occurrence between floods of a given size irrespective of the time in years to a recurrence interval of 0.9 years, or slightly more frequently than once a year.<sup>30</sup> The bankfull condition, therefore, will be equaled or exceeded approximately once a year. Bankfull conditions appears to be the technical definition that most closely fits the ordinary usage of mean annual flood level.

For these intermittent streams with no evidence they overflow their channel, it is reasonable to conclude that the upper boundary of bank may be located below the first break in slope, and instead be located at some lower line along the channel wall where there are visual indicators that represent the level at which the stream typically reaches its annual flood stage [sic]. Testimony of David Foulis, Transcript Vol. 8 at pp. 132-134. Despite the emphasis in the testimony on vegetation, it is clear from the preamble that banks may be devoid of vegetation, partially vegetated, or totally vegetated, so the vegetational status of the bank is not determinative. 310 CMR 10.54(2)(a). Other than the dispute about the presence or absence of vegetation on these Banks and the intro-

duction of the technical definition of mean annual flood by the Petitioner's attorney, there appears to be no real dispute over the relevant field indicators or any expert opinion which links certain indicators to any of the various regulatory formulations.

I find that the mean annual flood level upper boundary of bank is properly determined using field indicators as a proxy for the level that the flood flows reach on an average annual basis.<sup>31</sup> I further note that the difference between the upper boundary using first observable break in slope as advocated by the Petitioners and field indicators of bankfull conditions appears to be measured in vertical inches. There is no evidence to support a conclusion that the work would take place on a bank even were the delineation to be based upon first observable break in slope instead of on bankfull indicators.

#### Delineation of Bank - Lower Boundary

The lower boundary of Bank is the mean annual low flow level. 310 CMR 10.54(2)(c). The boundary of Land Under Water Bodies and Waterways is the mean annual flood level. Petitioners' witness testified that intermittent streams do not have any Land Under Water, and therefore, the entire resource area is bank. Testimony of James M. Scalise, II, Transcript Vol. 1 at p. 58. The Department apparently concurred with this interpretation, because it found there was no measurable Land Under Water at this site.<sup>32</sup> This interpretation has two consequences in this case. First, the witnesses described varying areas below the upper boundary of the bank when testifying about the presence of vegetation. The Administrative Magistrate did not credit the testimony of the Department's and applicant's witnesses as to the amount of vegetation growing on the Banks of the streams based on her conclusion that only a narrow band of embankment was bank and that the streambed could not be part of the bank. Recommended Decision at 54, n. 41. I have not been able to determine from the record the location of the mean annual low flow level for any of these streams, and the testimony of the Petitioners' witness viewed the Bank resource area as including the entire streambed. Testimony of James M. Scalise, II, Transcript Vol. 1 at p.56.

Second, the lack of any resource area between the two banks may have lead to the conclusion by the parties that the threshold of fifty feet for a wildlife habitat evaluation should be calculated based upon one fifty foot length rather than using a total by determining the footage for each bank. 310 CMR 10.54(4)(a)5. The Administrative Magistrate is correct that a prior case counted

29. Related text in the regulations supports this view. First, banks normally abut and confine a water body. The preamble for Bank states that banks act to confine floodwaters during the most frequent storms and banks confine waters during such storms to an established channel. 310 CMR 10.54(1). Second, banks separate the water body from bordering vegetated wetland. The preamble for bordering vegetated wetland states that bordering vegetated wetland slow the passage and provide storage for flood waters during periods of peak flows. 310 CMR 10.55(1). Therefore, banks do not necessarily confine peak flows. The boundary of Bordering Land Subject to Flooding is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm. 310 CMR 10.57(2)(a)3. No party has claimed that there is bordering land subject to flooding at these sites.

30. Dunn and Leopold, *Water in Environmental Planning*, W.H. Freeman and Company, 1978, p. 315.

31. To the extent the Administrative Magistrate accepted the delineation of mean annual flood level according to the treatise definition supplied by Petitioner's attorney in evaluating the testimony of witnesses, I do not accept those assessments.

32. A prior case determined that an intermittent drainage ditch is not excluded from the definition of stream on the theory that since the stream is dry there is no land under water. *Matter of Conroy*, Docket No. 97-074, Final Decision (June 9, 1998). The case specifically reserved judgment on the status and extent of other resource areas, including Bank.

each Bank of an intermittent stream separately, but it is not clear whether that was based on a determination of the lower boundary of Bank at mean annual low water and a footnote does not constitute a considered Department position. Recommended Final Decision at 64; Ruling on Motion for Partial Directed Decision at 17-18; See *Matter of Pacheco*, Recommended Decision, Docket No. 98-072 (Nov. 5, 1999) [6 DEPR 218]. The only Department position on this issue that I have been able to locate is a policy on Wildlife Habitat prepared in 1988 soon after the 1997 statutory amendment to include wildlife habitat as an interest of the Wetlands Protection Act. In its checklist for projects on inland banks, it advises that “[e]ach side of a river or stream (*except intermittent streams*) constitutes a bank; i.e., 50 feet of stream or river contains 100 feet of Bank.” (emphasis added) Division of Wetlands and Waterways Regulation, Wetlands Program Policy 88-1 and Wetlands Wildlife Advisory #2, Checklist for Projects on Inland Banks, p. 4, March 4, 1988. While this Policy has been supplanted by newer guidance documents on wildlife habitat, I have no indication that the Department’s position has changed.<sup>33</sup> I would conclude from the agreement of the parties and their witnesses on this question that stating a bank length as a single linear dimension is an accepted practice. At a minimum, I accept the practice of using the length of a bank as a single linear footage where there is no evidence of a mean annual low flow level establishing a resource area between the two sides of a stream channel.<sup>34</sup> I note that the location of mean annual low flow level in an intermittent stream would logically vary depending on the amount of time the streambed is in fact dry. Some streams flow much of the year and are dry only seasonally for a week or two in late summer. These streams would have a mean annual low flow level above the thread of the stream. For these headwater streams which are dry much of the year, the mean annual low flow level will logically be indistinguishable from the thread of the stream.

Proposed Work and the Performance Standards for Bank, 310 CMR 10.54(4)(a)(1 and 5)

The work involving stream crossings for this project falls into two distinct categories, for purposes of the wetlands protection regulations. Some work is proposed within resource areas, specifically bordering vegetated wetland and bank, and some work is proposed within the 100 foot buffer zone of these resource areas. See 310 CMR 10.02(2) (a) and (b). Where any activity is proposed within resource areas which will alter that area, a notice

of intent is required and the work must meet the performance standards for that area. 310 CMR 10.02(2)(a) and 310 CMR 10.03(1)(a)(2). Where work is proposed within the buffer zone, a notice of intent is required where the issuing authority determines that the activity will alter a resource area. 310 CMR 10.02(2)(b); Commentary. “Activity” and “Alter” are defined terms, and defined broadly, so that work in the buffer zone is relatively likely to meet this jurisdictional threshold. 310 CMR 10.04 (*Activity, Alter*). For example, the term “alter” includes the destruction of vegetation, signifying not that the destruction of vegetation is prohibited but instead that it is subject to review. Work in the buffer zone, therefore, may be subject to jurisdiction, but it is not subject to the performance standards that apply to work in resource areas. Instead, work in the buffer zone must contribute to the protection of the interests of the Wetlands Protection Act. 310 CMR 10.03(1)(a)(3). See 310 CMR 10.01(2) (list of interests).<sup>35</sup>

The performance standard for Bank states, “any proposed work on a Bank shall not impair . . .” 310 CMR 10.54(4)(a) (emphasis added). As discussed above, Bank is a resource area with an upper boundary along another resource area (vegetated wetland or floodplain), or, as in this case, an upland buffer zone. 310 CMR 10.54(2)(a). For the open-bottom culverts component of the project, the applicant has not proposed work on the bank. Further, the Petitioners have not alleged that the work will be on the Bank. Instead, the Petitioners claim that work near the Bank will indirectly impair the functions of the Bank and the Administrative Magistrate concluded that the project cannot meet the performance standards. As a matter of law, the performance standards do not apply to work in the buffer zone.<sup>36</sup> Instead, the work in the buffer zone to the bank requires review to ensure the protection of the interests of the Act.

Work in the buffer zone may cause alteration of resource areas, including bank, that will affect its ability to provide important wildlife habitat functions. Work on a bank is governed by the performance standard for wildlife habitat capacity and the 50-foot threshold for a wildlife habitat evaluation. 310 CMR 10.54(4)(a)(5). Work near a bank in the buffer zone as proposed for the open-bottom culverts is not governed by this performance standard and does not require a wildlife habitat evaluation.<sup>37</sup> See Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands, March 2006, p. 8 (conditions on work but not wildlife habitat evaluation for work in buffer zone).

33. During my work on the Massachusetts Wildlife Habitat Protection Guidance, my understanding was that the length of bank is only counted once, so that it would be the same as the linear footage of the stream.

34. I am not certain, however, whether the Department’s practice has been consistent and ask that a uniform practice be adopted for stating the linear footage of the bank resource area. For example, every notice of intent submitted by an applicant for work on bank must indicate a linear footage, but the instructions do not indicate whether each bank should be counted separately. I suspect for purposes of the wildlife habitat provisions in the regulations, that the fifty foot threshold was originally intended to apply to the length of a single bank for rivers and streams on the theory that an equal length would be stated once.

35. In October 6, 1997 regulatory revisions, the Department clarified the burden on applicants filing a Notice of Intent (compare 310 CMR 10.03 (1)(a) effective 10/6/97 with prior version). The Department retained the requirement that pro-

posed work in a resource area will contribute to the protection of the interests of the Act by complying with the performance standards for that area. 310 CMR 10.03 (1)(a) 2. The Department added a provision which addresses buffer zones and distinguishes the circumstance where the buffer zone and the riverfront resource area coincide. 310 CMR 10.03 (1)(a)3. Proposed work in the buffer zone must contribute to the protection of the interests of the Act, but must comply with performance standards only when work is within both the riverfront area and the buffer zone. Otherwise proposed work in the buffer zone need not comply with the performance standards for the adjacent resource area.

36. I note that many local bylaws have eliminated this distinction and do regulate the buffer zone as a resource area. The Wetlands Protection Act does not establish a buffer zone. M.G.L. c. 131, s. 40. Certainly work in the buffer zone is frequently and appropriately subject to conditions.

37. [See next page.]

Proposed Work in Buffer Zone to Bank

The distinction between proposed work in or on a resource area and work in the buffer zone has important regulatory consequences because it determines whether the performance standards apply. However, an applicant proposing work in the buffer zone must still demonstrate the work will contribute to the protection of the interests of the Act. Once an issuing authority determines work in the buffer zone is subject to jurisdiction, the commission or the Department reviews the work in the buffer zone to ensure that adjacent resource areas will not be adversely impacted.<sup>37</sup> In this case, the Department staff imposed stringent conditions in the permit to ensure that the work will not occur directly on resource areas, beyond that specified, and to avoid negative impacts on resource areas.<sup>39</sup>

The Petitioners claim, and the Administrative Magistrate found, that vegetation on the banks of the streams would die once shaded within the culverts, leading to instability of the banks in contravention of the performance standards. 310 CMR 10.54(4)(a). She further found that the installation of the open bottom culverts would destabilize the banks. I have evaluated these claims even though the performance standards do not apply to work in the buffer zone, because they call into question the Massachusetts River and Stream Crossing Standards which advocate the use of open bottom culvert design. The Stream Cross-

ing Standards do include guidelines for the siting, installation and monitoring of stream crossing structures, and I have reviewed the evidence on this issue within that context.<sup>40</sup>

The Standards contain guidance on the selection of locations for crossings. The recommendations include avoiding sensitive areas such as rare species habitat, unstable or alluvial areas, and meanders, and to align the crossing perpendicular to the channel. The proposed crossings appear to meet these criteria. Importantly, there is nothing in this guidance document which suggests that vegetated banks should be avoided; the document does not mention vegetation at all except in the context of reestablishing vegetation post-construction. The Standards include a minimum width to span the channel of 1.2 times the bankfull width to avoid channel constriction.<sup>41</sup> Using the information provided by the applicant and presented in the Recommended Decision, I have confirmed that the open bottom culverts proposed for each of the ten streams meets this 1.2 times bankfull width specification.<sup>42</sup>

Any effects on the stability of the bank from the death of shaded plants underneath the crossing is sufficiently speculative so that anticipatory action is not warranted. I am puzzled by the claim that the loss of an unspecified number of plants over an unspecified area because of shading along the natural stream bank is somehow more detrimental than the installation of a culvert which would eliminate the entire bank and any vegetation that might grow there. Even if the Petitioners were to persuade me that the loss of plants would destabilize the bank, I would not deny the project but instead would have conditioned the work to

37. See *Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands*, March 2006, p. 8 (conditions on work but not wildlife habitat evaluation for work in buffer zone). The Guidance further states that the “no adverse effect” standard for important wildlife habitat applies to alterations in resources areas only and not to areas proposed within the buffer zone. *Id.* at 13. Further, I note that had the proposed work triggered a wildlife habitat evaluation, an applicant could demonstrate no adverse effect by use of the Stream Crossing Standards and the open-bottom methodology. *Id.* at 16.

38. The nature of the review of work in the buffer zone was not codified until 2005. This narrative standard articulates the considerations that have been applied for many years. See 310 CMR 10.53(2) (2005 revisions). An issuing authority has the authority to deny proposed work in the buffer zone, but projects can and routinely are conditioned to protect resource areas. I am not aware of any denial of work in the buffer zone to allow a stream crossing.

39. David Foulis, the Department staffperson responsible for preparing the permit testified it was the most stringent permit issued for work in the buffer zone that he had ever seen.

40. Despite conflicting views on the extent of shading beneath the crossings, some plant mortality appears inevitable at least within the two longest crossings at Streams 5 and 39. Prefiled Direct Testimony of Pamela B. Weatherbee at para. 15, Testimony of Gary Sanford, Transcript Vol. 8 at pp. 99-100. enXco and the Department are correct that some light will enter through the openings at the ends of the crossings and the existing canopy is quite dense. See Prefiled Direct Testimony of Jeff Simmons at para. 47 and of David Foulis at para. 57. More importantly, the applicant is not required to ensure the survival of every plant within the crossings.

41. There is also an “openness ratio,” which is a ratio of the cross-sectional area of the opening divided by its length measured in meters. Wildlife may be reluctant to enter a confined space, so this measure is intended to accommodate the passage of wildlife. The general standards call for an openness ratio of >0.25. Neither the Standards nor the record contained sufficient information to enable me to calculate this ratio for each of the proposed crossings, but the wildlife identified as present at these sites (mice, shrews, voles, and salamanders) would appear unlikely to be troubled by enclosed spaces.

42. I prepared a table to compare the span as provided by the applicant for each of the streams, the distance between the crossing structure and the bank (for each side), the approximate bankfull width calculated by subtracting the area from culvert to bank from the span distance across the stream, and the bankfull width times 1.2 as specified in the Stream Crossing Standards. *At every crossing, the proposed span is greater than the minimum 1.2 times bankfull width. Compare second column with last column.*

Stream	Span	Culvert to Bank	Culvert to Bank x 2	Approx. Bankfull Width	1.2 x Bankfull Width
1	29'3"	>6'	>12'	17.25'	20.7'
2	15'6"	5'	10'	5.5'	6.6'
3	10'2"	4'	8'	2'	2.4'
5	24'4"	4'	8'	16.33'	19.6'
7	19'10"	4'	8'	11.75'	14.1'
8	22'1"	3'	6'	16'	19.6'
9	12'7"	2'	6'	8.5'	10.2'
10	21'6"	3'	6'	15.5'	18.6'
13	20'7"	3'	6'	14.5'	17.4'
39	12'1"	2'	4'	8'	9.6'

See Recommended Final Decision at n. 13 and n. 14. I rounded down by an inch on certain span measures for ease of calculation, so the results may be slightly conservative or otherwise imprecise and are provided here for illustrative purposes.

prevent any adverse effects or required the applicant to undertake preventative bank restoration. The Petitioners' testimony about the importance of vegetation on banks is generally quite true, but there is no evidence that isolated plant mortality within the structures will have a material effect on the bank.<sup>43</sup> I also conclude that the excavation of the trenches and installation of the footings will not cause material impacts to the banks. Inherent in the Department's approval of the Massachusetts River and Stream Crossing Standards is its considered judgment that these structures are sufficiently protective of wetland resource areas and meet the performance standards.<sup>44</sup>

The Stream Crossing Standards contain recommendations for monitoring after a crossing has been installed. These include inspection for erosion, structure stability, evidence of stream instability, presence of debris accumulation, maintenance of streambed continuity, problems with infiltration, and indications of scouring downstream or sediment aggradation upstream of the structure. The inclusion of these monitoring requirements suggests to me that any impacts from installation of crossings can and should be addressed after construction.<sup>45</sup> The inclusion of this list on monitoring requirements leads me to conclude that any effects on the banks from plant mortality can be addressed if and when they occur.

#### Wildlife Habitat Evaluation

When work will be conducted on an inland bank, the proposed work may not impair the capacity of the bank to provide important wildlife habitat functions. A wildlife habitat evaluation is required for any work on a bank where the work will cumulatively alter more than fifty feet or 10%, whichever is less, of bank on a single lot. As discussed above, the streams crossed by open-bottom arches involve work within the buffer zone but not on the bank itself, and therefore no habitat evaluation is required for these ten crossings (Streams number 1,2,3,5,7,8,9,10,13 and 39). Streams 12 and 15 will be crossed by traditional round culverts and clearly involve work on inland bank.

The parties were focused on the banks at the open-bottom culvert crossings and the question of whether a wildlife habitat evaluation was necessary for that work.<sup>46</sup> The Administrative Magistrate did not accept the Department's assertion, not disputed by the Petitioners, that the bank affected by the two culverts would be 48 feet (18 feet for stream #12 and 30 feet for stream #15). Because I have found that the open-bottom culverts do not involve work on bank and therefore do not require a wildlife habitat eval-

uation, the question of how to calculate linear footage of bank alteration for purposes of the evaluation threshold is critical with respect to the two closed culverts. I now reach that question.

Stream 12 is associated with Wetland #13 and these areas are located at the entrance for the access road toward Crum Hill from Tilda Hill Road. In fact, it is described as a drainage ditch parallel to Tilda Hill Road. Recommended Decision at 11. The culvert proposed for this crossing is 18 feet in length. As part of the construction process, enXco would lay steel plates over about 80 feet of Stream 12 to allow large vehicles to turn onto the access road. The steel plates would be removed and the area restored when construction is completed. This work appears to be on land owned by Matt and Maureen Bakke. Stream 15 was identified during the review by the Florida Conservation Commission after submission of the notice of intent. It is located on land owned by the Town of Florida. The Administrative Magistrate found that this work would exceed the threshold for inland bank because the work at Stream 12 would actually alter 36 feet (18 feet on each side of bank) plus 160 feet (80 feet on each side of bank) and at Stream 15 would alter 60 feet (30 feet on each side of bank).

I begin with Stream No. 12, the roadside drainage ditch along Tilda Hill Road which must be crossed for the Crum Hill access road. This stream received little attention in the testimony, largely because there was no dispute that the upper boundary of the bank was the first observable break in slope. Recommended Final Decision at 27, n. 21. Although the Administrative Magistrate counted the length of steel plating necessary on a temporary basis to allow for entrance of construction vehicles as bank alteration, no party addressed the status of the plates. Recommended Final Decision at 64-65. Although at first blush it might seem that the steel plates would lie directly on the upper boundary of the bank, the plan view of the steel plating shows that the bank is well below the plating and will be physically unaffected by it. Because there is no argument, or more importantly, evidence in the record to factually support a conclusion that the steel plates will impact the bank, I will not include that length for purposes of the wildlife habitat evaluation threshold.

Although the record indicates that there may be flow more frequently in this stream than others on the site, there is no argument or evidence in the record as to the location of the lower boundary of bank and mean annual low water. As the parties have agreed that there is no Land Under Water resource area and these are intermittent streams, I conclude that the bank resource area should be counted as a single length for purposes of the wildlife habitat

43. While vegetation does contribute to the stability of banks, other materials such as boulders, cobble, gravel and sand are important as well. Prefiled Direct Testimony of Gary Sanford at para. 33 and Prefiled Supplemental Testimony at para. 22; Prefiled Direct Testimony of David Foulis at para. 52. If the survival of all bank vegetation were a prerequisite to ensuring bank stability, the regulation would contain a prohibition of work which would result in plant mortality.

44. While the Stream Crossing Standards were developed primarily in response to concerns about wildlife and fisheries, they are not inconsistent with the protection of other interests of the Wetlands Protection Act.

45. The monitoring requirements apply generally to all stream crossings, including streambed construction and other work far more extensive than what is proposed here.

46. The applicant did submit a wildlife habitat evaluation with its notice of intent in 2003. In the superseding order of conditions, the Department included a finding that certain submittals by the applicant related to the vegetation at the site constituted an evaluation. The question of what constitutes a wildlife habitat evaluation has been answered by the Wildlife Habitat Protection Guidance issued by the Department in 2006. I agree with the Administrative Magistrate that the submittals identified in the findings accompanying the superseding order do not constitute a wildlife habitat evaluation. See Ruling on Motion for Partial Directed Decision at 20.

evaluation threshold. Finally, as an alternate grounds I note that the applicant's witness Mary Johnson did prepare a wildlife habitat evaluation for Stream 12. *See* Prefiled Direct Testimony of Pamela Weatherbee, Exhibit E. In Ms. Johnson's direct testimony she states that impacts from the two culverts, at less than the fifty foot threshold, will not have an adverse effect on wildlife habitat. Prefiled Direct Testimony of Mary Johnson at para. 41-43. Because she had evaluated Stream 12 and is qualified to testify as to wildlife habitat, I accept her professional opinion and conclude that there will be no adverse effect on wildlife habitat at Stream 12.

As to Stream 15 which will be crossed by a 30 foot culvert, I have already addressed the question of how linear feet of bank may be counted for intermittent streams. Here the culvert is only 12 inches in diameter and the stream is described as having a "dry streambed for much of the year," so mean annual low flow level is likely to be the thread of the stream. *See* Notice of Intent, Data from Woodlot Alternatives, Exhibit 1.1.

Because the threshold applies per lot, again based upon the text of the regulation, I find that Stream 15 may be assessed separately. *See* Preface to the 1987 Regulatory Revisions, Wetlands Protection Act Regulations, at IV. B. I have looked to the notice of intent plans and accompanying list of landowners, as it is reasonable to conclude that the ownership of lots would be determined at the time the application is filed. Although the applicant's engineer indicated that grade restrictions may preclude its use, I have allowed the substitution of an open-bottom culvert at this location in accordance with the Department's preference for this type of crossing where feasible. *See* Prefiled Direct Testimony of Jason Krzanowski at para. 23. I find that for purposes of the threshold for wildlife habitat, the linear feet of bank on this lot is 30 feet.<sup>47</sup>

#### Identification of Bordering Vegetated Wetlands

I concur with the conclusion of the Administrative Magistrate that the Petitioners did not meet their burden of going forward to show that there are bordering vegetated wetlands on the site that are not properly delineated or will be impacted inconsistent with the performance standards (Issue No. 1). Recommended Final Decision at 19-25 and Ruling on Motion for Partial Summary Decision at 4-6. I agree that the existence of trampled vegetation where the plant species may still be accurately identified is not sufficient to qualify as a disturbed area under the regulations. 310 CMR 10.55(2)(c)3. A claim that bordering vegetated wetlands should be delineated more precisely based upon evidence of hydric soils is not sufficient to show that the area is within the limit of work. Finally, the Petitioners did not meet their burden of going forward to show that work within the buffer zone will adversely affect the bordering vegetated wetland. The applicant

must establish a clear limit of work and will provide erosion and sedimentation controls to protect the resource areas. Special Conditions 23 to 29; Prefiled Direct Testimony of Jason Krzanowski at para. 90-99, Plan of Record, Sheet L132. The requirement in the permit that the applicant hire a compliance monitor to oversee construction will also ensure that the limit of work is respected. Superseding Order Condition No. 27.

#### Bordering Vegetated Wetlands Replication

I accept the recommendation of the Administrative Magistrate that the Petitioners have not met their burden of going forward on whether the replication area for bordering vegetated wetlands complies with the regulations at 310 CMR 10.55(4)(b)6 (Issue No. 6). The Department has guidelines for the siting and installation of replication areas. Massachusetts Inland Wetland Replication Guidelines, March 2002. A single observation of dry test pits is not sufficient to determine whether seasonal groundwater at the proposed site is suitable for a replication area. *Id.* at Section 2.3.1. Prefiled Direct Testimony of Ed Stockman, para. 32. I also agree with the resolution of Issue 6a, that an area selected for replication may be larger than the area lost. Decision on Motion for Partial Directed Decision at 23.

#### Stormwater Management

I concur with the conclusion of the Administrative Magistrate that the applicant has shown by a preponderance of the evidence that the project will comply with the Department's stormwater management standards. On Issues 7c and 7d, I agree with the Administrative Magistrate that the Petitioners did not meet their burden of going forward on the adequacy of the erosion and siltation control plan and the operation and maintenance plan. Decision on Motion for Partial Directed Decision, at 27 and Recommended Final Decision at 75. I have reviewed the stormwater management plans for this project carefully because large projects, particularly during construction, can adversely affect wetland resource areas if a storm event occurs and controls are inadequate. Again, I note that the permit requires the applicant to employ a compliance monitor to oversee construction at the site and who will have the authority to stop work if necessary. While such a condition is unusual in a wetlands permit, the site is remote and the presence of a person responsible for environmental compliance should prevent some of the problems that might otherwise lead to enforcement by the Department.<sup>48</sup> The requirement for an onsite compliance monitor, however, does not signal any abdication by the Department of its enforcement responsibilities.

47. Even if the applicant were to perform an evaluation and found an adverse effect on habitat, the remedy under the new guidance would be the installation of open-bottom culverts.

48. The remote location of this project and its relative inaccessibility may have contributed to the fewer and less comprehensive visits to this site. The Department is a reviewing agency; the regulations do not require Department staff to have inspected every area where work is proposed and do not preclude either the use of imaging or relying on observations of representative sites in reaching opinions on the appropriate contents of a permit.

## Other Procedural Issues

As correctly described by the Administrative Magistrate, to meet the burden of going forward in a wetlands case, the Petitioners had to "produce at least some credible evidence from a competent source in support of the position taken." 310 CMR 10.03(2). Recommended Final Decision at 32. As to the delineation of the inland bank, the Petitioners may not have been required to submit an entire delineation but they were required to submit evidence *as part of their direct case* showing that the applicant's delineation was incorrect, with factual support. Adducing testimony on cross-examination of applicant's witness by having the Petitioner's attorney present material from a treatise, however authoritative, does not meet this burden. The hearing would have proceeded more efficiently had the Petitioners presented their theory of the location of mean annual flood level in prefiled direct testimony. In addition to asserting a definition of mean annual flood, the Petitioners needed to show how this line would be located and to actually locate it in at least one area sufficiently representative to show its position relative to the first observable break in slope and the delineation offered by the applicant. I reject the conclusion of the Administrative Magistrate that the Petitioners met their burden of going forward on this issue. Recommended Final Decision at 30-33.

Secondly, I do not accept the view of the Administrative Magistrate that any theory offered by a witness that is not also addressed in a post-hearing brief is properly deemed "abandoned" by that party and may be disregarded. While a well-crafted and comprehensive closing brief can certainly assist decisionmakers in the evaluation of evidence, the Department has not been prescriptive about their contents, nor does the hearing rule related to briefs suggest this level of formality. 310 CMR 1.01(13)(k).

## Conclusion

I issue a Final Order of Conditions for the Hoosac Wind Project incorporating the superseding order of conditions for this project with the addition of a condition to be inserted before the final sentence of Special Condition No. 29:

The applicant shall specifically report on the condition of the Inland Bank within the open bottom stream crossings, consistent with the monitoring best management practices identified in the Massachusetts River and Stream Crossing Standards, and comply with any order of the Department to undertake corrective action where an annual report indicates any adverse affects.

Additionally, the following Special Condition will be added:

The applicant may substitute at Stream 15 an open-bottom crossing for the proposed closed culvert, provided that revised plans are submitted to the Department and Department staff field verify that the work will be limited to the buffer zone.

The Plan of Record for this project includes the final set that enXco submitted and revised plan pages accepted by the Administrative Magistrate on August 18, 2005. I direct Department staff to prepare a Final Order of Conditions for my signature within five business days, consistent with this Final Decision.

Based upon the documents submitted to the Secretary of the Executive Office of Energy and Environmental Affairs under M.G.L. c. 30, s. 61 and to the Department under M.G.L. c. 131, s. 40, I find that the conditions to be incorporated into the Final Order of Conditions for this project constitute all feasible measures to avoid damage to the environment, and will minimize and mitigate such damage to the maximum extent practicable for those impacts subject to the Department's authority.

The parties to this proceeding are notified of their right to file a motion for reconsideration of this Decision, pursuant to 310 CMR 1.01 (14)(d). The motion must be filed with the Docket Clerk and served on all parties within seven business days of the postmark date of this Decision. A person who has the right to seek judicial review may appeal this Decision to the Superior Court pursuant to M.G.L. c. 30A, §14(1). The complaint must be filed in the Court within thirty days of receipt of this Decision.

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In the Matter of CITY OF CAMBRIDGE, DEPARTMENT OF  
 PUBLIC WORKS

Docket No. 2005-088  
 Docket No. DEP-05-805  
 DEP File No. 123-175  
 Cambridge

June 1, 2007

*Arleen O'Donnell, Acting Commissioner*

*Sewer and Stormwater Redevelopment Project-Stormwater Standards-Alternatives Analysis for Riverfront Area-Licensure Requirements for Expert Witnesses*—Acting Commissioner Arleen O'Donnell adopted the ultimate conclusion of Administrative Magistrate Mark L. Silverstein's recommended decision allowing a Cambridge/Alewife municipal drainage project to proceed by finalizing DEP's Superseding Order of Conditions against the opposition of a neighborhood group but did not adopt its reasoning, taking issue with Magistrate Silverstein's rejection of the 10-citizens' group's expert unregistered "citizen engineer" as unqualified, and ruling that professional licensure should not necessarily be required of expert witnesses but background and skills must also be considered. In approving the project, the Acting Commissioner noted that alternative sites were shown to be impractical and that the project was "grandfathered" under the riverfront-area regulations, and found that the project should be considered a "redevelopment" for purposes of applying stormwater-management standards.

**FINAL DECISION**

**T**his appeal involves a project by the Cambridge Department of Public Works to control combined sewerage overflows (CSOs) to the Little River and Alewife Brook. The work

will separate sewer and stormwater flows as part of a court-ordered plan to improve water quality in the Charles, Alewife, Boston Harbor and other related water bodies. The project consists of the construction of a stormwater management system — culverts, a sediment forebay, and a 3.5 acre detention wetland to provide some treatment prior to discharge into the Little River upstream of the Alewife. The Department issued a superseding order for the project, affirming the local order and finding that the design meets the requirements of the wetlands regulations and the Department's Stormwater Management Policy. A citizen group appealed, citing availability of an alternative site location outside the riverfront area, stating concerns about flooding and flood storage volume, and citing various inadequacies in the design of the system.

The Administrative Magistrate issued a Partial Summary Decision followed by a Directed Decision, sustaining the superseding order, largely based upon his conclusion that the Petitioner's chief witness was not qualified because he is not a professional registered engineer or competent to provide land valuation testimony. While the hearing rules do require summary decision to be based upon evidence admissible in Massachusetts courts, more generally the Department conducts its hearings using the standard of evidence on which "reasonable persons are accustomed to rely in the conduct of serious affairs." M.G.L. c. 30A, s. 11(2), 310 CMR 1.01(13)(h).<sup>1</sup> The wetlands regulations allow the issuing authority to require an applicant to provide supporting materials from a registered professional engineer or other professionals with specialized expertise but require "credible evidence from a competent source" to meet the burden of going forward at a hearing. 310 CMR 10.05(4)(h); 310 CMR 10.03(2).

The Department has determined witnesses are disqualified because they lacked specialized knowledge on the subject area of their testimony, but not for lack of a professional license. I am not persuaded by the analysis of precedent by the Administrative Magistrate that professional licensure is indeed required.<sup>2</sup> I accept the recommendation as to the qualifications of this witness to the extent that Stephen Kaiser was offered as an expert witness within the category of some type of "engineer," but the Department has allowed testimony by individuals based upon their backgrounds and skills without adhering to particular categorizations. See *Matter of Massachusetts Water Resources Authority (Blue Hills Covered Storage Project)*, Docket No. DEP-04-734, Final Decision, September 20, 2005 [12 DEPR 167] (the focus is properly on indicia of specialized knowledge relevant to the proceeding rather than how that knowledge is categorized or defined).<sup>3</sup> I conclude that some of the Administrative Magistrate's

1. The extent of the expertise of the witnesses, of course, goes to the weight or reliability of the evidence rather than its admissibility.

2. I am also concerned with such a requirement because it is inconsistent with the regulatory standard and the distinction between individuals responsible for designing and reviewing projects. Certainly conservation commissions, Department staff, and various third parties routinely use their own competencies to address plans prepared by registered professional engineers. I also cannot agree that only a licensed real estate appraiser is competent to provide testimony as to

practicable alternatives. There will certainly be circumstances where an alternative may be found impracticable without such expertise, and the regulations themselves suggest that precise calculation of costs is not always necessary.

3. Knowledge of matters relevant to wetlands cases can be acquired through education, training or experience, and experts need not be professionals or hold advanced degrees. The actual qualifications of the witness, in terms of what the individual knows about the topic and the facts of the case, are much more important than the individual's title. See, e.g., *Matter of Scott Cheney*, Docket No. 98-096, Final Decision [6 DEPR 198] (October 26, 1999).