

November 21, 2024

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

**Re: Louise Drive Extension  
MassDEP File No. 159-1300  
Notice of Intent Peer Review #2**

Dear Ms. Goodlander:

BETA Group, Inc. (BETA) has reviewed revised documents and plans for the Notice of Intent (NOI) submitted for the parcels located at **Louise Drive Extension, further identified as the Town of Franklin Assessor's Parcel IDs: Map 339, Lots 9, 13, 14, 15, and 16; and Map 349, Lot 2 in Franklin, Massachusetts** ("the Site"). 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:

- Letter entitled **Response to Peer Review Comments for NOI**; prepared by Goddard Consulting, LLC., dated November 7, 2024. Inclusive of:
  - WPA Form 3; and
  - NHESP Habitat Map.
- Plan (1 Sheet) entitled **Grading and Drainage Plan**; prepared by Goddard Consulting, LLC., dated September 18, 2024 and revised October 15, 2024; signed and stamped by Brandon D. Carr MA PE No. 51472.
- Plan Set (11 Sheets) entitled **NOI Submission Louise Drive Extension**; prepared by DiPrete Engineering; dated September 18, 2024, revised November 7, 2024; signed and stamped by Brandon D. Carr MA PE No. 51472 and Robert G Babcock MA PLS No. 49233.

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

- Site visit on April 2, 2024
- **Massachusetts Wetlands Protection Act 310 CMR 10.00** effective October 24, 2014
- **Wetlands Protection Chapter 181 From the Code of the Town of Franklin**, dated August 20, 1997
- **Conservation Commission Bylaws Chapter 271 From the Code of the Town of Franklin**, dated July 11, 2019
- **Town of Franklin Conservation Commission Regulations**, dated October 3, 2019
- **Town of Franklin Best Development Practices Guidebook**, dated September 2016

## **PEER REVIEW UPDATE—NOVEMBER 21, 2024**

The Applicant has provided revised materials and written comment responses pursuant to BETA's October 9, 2024 peer review letter. BETA's original comments from the October 9, 2024 peer review letter are

included in plain text. Comment responses attributed to Goddard Consulting, LLC (GC), are provided in *italics* and are prefaced with “GC:” 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 and Bylaw. In addition, a stormwater management review has been conducted by BETA’s Stormwater Engineer and is included at the end of this letter.

## SITE AND PROJECT DESCRIPTION

The 8.9-acre Site consists of six (6) parcels identified as Map 339 Lot 9, 13, 14, 15, and 16 and Map 349 Lot 2 in Franklin, Massachusetts situated along Louise Drive Extension, a paper road associated with an approved subdivision plan. The Site is bounded to the north by residential homes and Washington Street, to the east by residential home and Byron’s Way, to the west by undeveloped wooded lots, and to the south by undeveloped wooded lots and the Oak Hill Village Conservation Area. Existing improvements at the Site include a catch basin at the intersection of Byron’s Way and Louise Drive and various fieldstone walls within the wooded portions of the Site. Topographic relief at the Site generally follows a south-to-north orientation.

Resource Areas boundaries at the Site have been approved by an Order of Resource Area Delineation (ORAD) issued on June 3, 2024 under DEP File #159-1290. Areas Subject to Protection and Jurisdiction 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”) and the Town of Franklin Wetlands Protection Bylaw (Chapter 181) and its associated Regulations (collectively “the Bylaw”) present at the Site include Bank, Bordering Vegetated Wetland (BVW), Land Under Water (LUW), Isolated Vegetated Wetland (IVW), and Buffer Zone.

The Site is not located within a Zone I, Zone II, or Interim Wellhead Protections Area, and there are no Surface Water Protection Areas (Zone A, B, or C), or Outstanding Resource Waters (ORWs). There are no 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 Potential Vernal Pools (PVPs) or Certified Vernal Pools (CVPs) located on or within 100 feet of the Site.

According to the FEMA Flood Insurance Rate Map (FIRM) community panels number 25021C0312E dated July 17, 2012, the Site is not located within a mapped flood zone.

Natural Resource Conservation Service (NRCS) soil maps of the Site indicate the presence of Charlton-Hollis-Rock outcrop complex with a Hydrologic Soil Group (HSG) rating of D and Montauk fine sandy loam with a HSG rating of C.

The Applicant seeks approval for the construction of a private access road and cul-de-sac with an associated stream and wetland crossing, wetland replication area, and stormwater management system. The access roadway is being constructed for the eventual construction of a subdivision consisting of five (5) individual lots. The Project is being filed under the Limited Project provision at 310 CMR 10.53(3)(e)<sup>1</sup>. Proposed work includes the following activities (collectively referred to as the “Project”):

---

<sup>1</sup> The construction and maintenance of a new roadway or driveway of minimum legal and practical width acceptable to the planning board, where reasonable alternative means of access from a public way to an upland area of the same owner is unavailable. Such roadway or driveway shall be constructed in a manner which does not restrict the

- Installation of erosion controls;
- Vegetation removal and grubbing;
- Site re-grading;
- Construction of a three (3)-sided, open bottom culvert that meet the Massachusetts Stream Crossing Standards;
- Filling of 2,396 square feet (sf) of BVW;
- Establishment of a 4,800-sf wetland replication area;
- Paving a total of 626± linear feet (lf) of roadway;
- Construction of a stormwater management system consisting of four (4) catch basins, a sediment forebay, a sand filter, and a detention pond; and
- Final site-wide vegetative stabilization.

The Project will result in temporary and permanent impacts to Bank, BVW, LUW, and Buffer Zone. The following Resource Area impacts are proposed:

- 2,396 sf of impacts to BVW;
- 40.5 lf of impacts to Bank;
- 4,877 sf of impacts to the 25' Buffer Zone;
- 5,952 sf of impacts to the 50' Buffer Zone; and
- 31,780 sf of impacts to the 100' Buffer Zone.

**BETA2: Resource Area impacts have been updated to include:**

- **320 sf of impacts to LUW;**
- **335 sf of temporary impacts to BVW;**
- **505 sf of permanent impacts to BVW;**
- **4,877 sf of impacts to the 25' Buffer Zone;**
- **5,952 sf of impacts to the 50' Buffer Zone; and**
- **31,780 sf of impacts to the 100' Buffer Zone.**

## ADMINISTRATIVE AND PLAN COMMENTS

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

---

flow of water. Reasonable alternative means of access may include any previously or currently available alternatives such as realignment or reconfiguration of the project to conform to 310 CMR 10.54 through 10.58 or to otherwise minimize adverse impacts on resource areas. The issuing authority may require the applicant to utilize access over an adjacent parcel of land currently or formerly owned by the applicant, or in which the applicant has, or can obtain, an ownership interest. The applicant shall design the roadway or driveway according to the minimum length and width acceptable to the Planning Board, and shall present reasonable alternative means of access to the Board. The applicant shall provide replication of bordering vegetated wetlands and compensatory flood storage to the extent practicable. In the Certificate of Compliance, the issuing authority may continue a condition imposed in the Order of Conditions to prohibit further activities under 310 CMR 10.53(3)(e).

**Table 1. NOI Plan**

NOI Plan Requirements	Yes	No
Scale of 40'=1" or larger	✓	
North Arrow (with reference)	✓	
Topographic contours (2' intervals)	✓	
Existing Conditions Topography (with source and date of survey)	✓	
Proposed Topography	✓	
Existing and Proposed Vegetation	✓ (BETA2)	
Existing Structures and Improvements	✓	
Resource Areas and Buffer Zones labeled	✓ (BETA2)	
Location of Erosion Controls	✓	
Details of Proposed Structures	✓	
Construction Sequence and Schedule	✓ (BETA2)	
Registered PLS Stamp (Existing Condition Plans Only)	✓	
Assessors' Reference	✓	
Abutting Property Assessors' Reference	✓	
Survey Benchmark	✓	
Accurate Plan Scale	✓	

**PLAN AND GENERAL COMMENTS**

A1. MassDEP has not issued a file number for this Project as of this writing.

*GC: Massachusetts DEP issued the file #159-1300 to the project.*

**BETA2: MassDEP has provided the following technical comments for the Project:**

The wetland replication area is not depicted on site plans. The Applicant should submit a revised site plan to MassDEP and the Commission. The site plan should include a cross-section of the replication area, in addition to depicting its location, to demonstrate compliance with 310 CMR 10.55(4)(b)2.-5. The replication area should be constructed and sited according to the MA Inland Wetland Replacement Guidelines. The Commission may include a condition that requires a monitoring period of two years, and that the restoration area must achieve 75% survival of all planted strata to be considered in compliance for the issuance of a COC. - The Applicant should provide information related to the physical characteristics of Bank resource area prior to alteration and how it will be restored, as temporary impacts are indicated in the WPA Form 3. Additionally, the Applicant states that the proposed stream crossing will not result in impacts to the existing natural substrate of the intermittent stream, but in the section addressing performance standards associated with Bank the Applicant states that "The proposed stream crossing will impact the bottom of the intermittent stream which would reduce the length of the stream, or height of banks." How does the Applicant plan to not impact the existing natural substrate of the stream? Lastly, has the Applicant considered whether dewatering devices will be necessary during the installation of the crossing? The Applicant should provide MassDEP and the Commission with additional information regarding the crossings installation and anticipated dewatering methods. - Noting that the project appears to meet the performance standards for 310 CMR 10.54(4) and 310 CMR 10.55(4)(b), the Applicant did file as a limited project. If intended to be reviewed as a limited project, the Applicant should demonstrate compliance

**with all the provisions of 310 CMR 10.53(e). - On sheet 9 of 11 of site plans, the stated SHGW elevation is 346.6 and the bottom of pond elevation is 347. The Applicant should investigate if groundwater seepage will affect the functionality and performance of the basin. The Applicant should ensure that the basin complies with planning and design consideration as outlined on pages 108-111, V.2, Ch.2, of the MA Stormwater Handbook. - The Commission may include the O&M plans as special conditions in the OOCs, if approved. - All revised materials should be submitted to MassDEP and the Commission.**

A2. The existing conditions should include the following:

- a. Existing vegetation and individual trees/shrubs with a diameter greater than 1" proposed for removal should be shown on the Existing Conditions Plans per Bylaw Regulation Section 7.18.1.5. It is BETA's understanding that the Commission generally increases the size threshold for tree locations based on the project scope and therefore defers to the Commission on this matter; and

*GC: The site plan does not depict vegetation that is 1" or greater on the existing conditions plan. Additional field survey would be needed to update the plan. Goddard suggests the minimum size threshold be increased. The plan can be updated and submitted as a special condition.*

**BETA2: BETA defers to the Commission on this submission requirement and whether any survey should occur prior to the issuance of the OOC.**

- b. Buffer Zones of Resource Areas including, associated 0-25', 25-50', and 50-100' Buffer Zones as required per Section 7.18.1.8 of the Bylaw.

*GC: The site plan has been updated to depict the 25, 50, and 100-foot buffer zones.*

**BETA2: Comment addressed; Buffer Zones are depicted on all plan sheets.**

A3. The proposed tree line should be shown on the plans.

*GC: The site plan has been updated to depict the tree line.*

**BETA2: Comment addressed.**

A4. A Construction Sequence detailing the sequence of proposed activities should be depicted on the approved plan set and in the NOI application per Section 7.15 of the Bylaw.

*GC: Diprete Engineering provided a detailed Construction Sequence with the original Notice of Intent filing. The Construction Sequence is found within the submitted Stormwater Pollution and Prevention Plan (SWPPP) dated 9/18/2024. The Construction Sequence breaks the project into phases, providing sequencing and estimated dates of construction activities.*

**BETA2: Comment addressed; the Construction Sequence has been added to the plan notes on Sheet 3.**

A5. The Bank to intermittent stream confirmed under the ORAD should be depicted on all plan sheets with the associated SB flagging series as detailed in the narrative.

*GC: The site plan has been updated to depict the Bank of intermittent stream as confirmed under the ORAD.*

**BETA2: Comment addressed.**

A6. Depict impact locations on the plan. The extents, locations, and nature of impacts to Bank and BVW are not clear. Specifically, BETA provides the following comments:

- a. Based on BETA's scaled area takeoffs, the entirety of BVW within the limits of work is attributed to fill. Clarify whether portions of these impacts will be temporary.
- b. The BVW impact area quantification appears to include the footprint of the intermittent stream. Quantify impacts to LUW and revise the total permanent impacts to BVW.
- c. Depict the extents of Bank impacts on the plans.
- d. Depict the locations of Bank on the cross sections in the plan set to demonstrate that the wall and culvert will not require permanent impacts to Bank.

*GC: The site plan has been updated to clarify the limits of the BVW fill, depict the extent, location and extent of Bank.*

**BETA2: Temporary and permanent impacts to BVW and LUW have been identified on the plans. Bank impacts should be depicted on the plans and Bank should be labeled on the cross-sections.**

A7. The wetland replication area should be shown on the plans.

*GC: The site plan has been updated to depict the replication area.*

**BETA2: Comment addressed.**

A8. On page 4 of the WPA Form 3, the Applicant should indicate that the Project involves stream crossings and identify the number of stream crossings proposed.

*GC: The WPA Form 3 has been updated to indicate that the project involves stream crossings. The revised WPA Form 3, attached within this supplemental submittal, specifies that the project includes 1 new stream crossing.*

**BETA2: Comment addressed.**

## WETLAND RESOURCE AREAS AND REGULATORY REVIEW

Resource Areas at the Site have been approved by an Order of Resource Area Delineation (ORAD) issued on June 3, 2024 under DEP File #159-1290. BETA also conducted a review of the onsite Resource Areas under the initial submission of the ORAD on April 2, 2024 confirming delineation. The Project proposes impacts to onsite areas Subject to Jurisdiction and Protection under the Act and Bylaw including, BVW, Bank of intermittent stream and the associated 0-25', 25-50' and 50-100' Buffer Zones. A variance request has been submitted for work within the Resource Areas and Buffer Zones as required by the Bylaw. The Project is subject to the MassDEP Stormwater Standards and a review of compliance with these Standards will be completed as part of the Planning Board review process. A Stormwater Pollution Prevention Plan (SWPPP) has been submitted due to the Project proposing more than one (1) acre of land disturbance. The Project is proposing a wetland replication area at a ratio of 2:1.

The proposed crossing will consist of an open-bottom arch culvert that will provide a span of at least 1.2 x the bank-full-width (average BFW = 11.76', proposed span of 14.5'), provide an openness ratio of 1.07 (which is greater than 0.82), and maintain a natural stream substrate.

The NOI application includes narrative information describing the Project and proposed mitigation. Mitigation measures include use of erosion controls, creation of a wetland replication area, and creation of a stormwater management system consisting of four (4) catch basins, a sediment forebay, a sand filter, and a detention pond. Additional information is required to demonstrate compliance with the Bylaw and Act and further details are required regarding, impacts to Resource Areas and buffer zones, the proposed replication area, mitigation for work within Resource Areas and buffer zones and a dewater/water control plan should be submitted. Plan revisions have been included for compliance with the Bylaw and for clarity of proposed work. Special Conditions have also been suggested for use by the Conservation Commission.

**BETA2: The Applicant has provided additional and revised information regarding Resource Area impacts and associated restoration, the proposed replication area, construction sequencing of the crossing, and compliance with the Act and Bylaw. In addition, the limits of work at the wetland/stream crossing have been reduced to minimize impacts while still providing sufficient space for construction activities. Where applicable, BETA has requested additional information on proposed mitigation and has recommended several Special Conditions for the Commission's consideration.**

## **RESOURCE AREA AND BOUNDARY COMMENTS**

BETA conducted a Site visit on April 2, 2024 pursuant to the previously filed ANRAD to assess existing conditions and review Resource Area delineations, focusing on the definitions and methodologies referenced under the Act and the Bylaw. Resource Area delineation was approved through the ORAD on June 3, 2024 under DEP File #159-1290.

## **CONSTRUCTION COMMENTS**

- W1. Material stockpile and laydown areas should be labeled on the Project plans. Erosion controls should be depicted along all areas of work. Currently erosion controls are only present within the northern extent of the Project.

*GC: The site plan has been updated to label material stockpile locations and laydown areas. Erosion controls to the south are upgradient of the working locations. Water from the site will not travel in this location so sedimentation or erosion is not predicted to be an issue.*

**BETA2: Stockpile locations have been provided but should be surrounded by erosion controls.**

**BETA agrees that erosion and sedimentation of upgradient areas is not likely; however, erosion controls or another feature should be installed to demarcate limits of work. If amenable to the Commission, orange construction fencing could be used in lieu of erosion control at appropriate locations. It is anticipated that the Conservation Agent will review and approve erosion controls prior to construction.**

- W2. The SWPPP that was submitted with the NOI was not completed. BETA recommends the Commission include a Special Condition that a SWPPP must be submitted to the Commission for review and approval prior to the commencement of work.

*GC: Goddard Consulting agrees with this comment. The SWPPP will be completed upon contractor selection.*

**BETA2: Comment addressed. BETA recommends a Special Condition be included within the Order of Conditions requiring submittal of a completed SWPPP prior to commencement of work.**

- W3. Depict all existing contours to indicate how proposed grading will tie in to surrounding grades on the grading plan.

*GC: The site plan has been updated to depict all existing contours. The proposed grades on the plan will tie directly into the existing grades.*

**BETA2: Comment addressed.**

- W4. The limit of work around the proposed crossing appears to be larger than what is required based on the grading plans. The Applicant should clearly indicate how much area is required for wall construction and revise the limits of work accordingly. Resource Area impacts should be limited to the extent feasible.

*GC: The limit of work has been modified to depict only what is needed to provide access around the wall construction (10' minimum space). The updated areas are shown on Sheet 10 of the revised plans.*

**BETA2: The limit of work has been revised to encompass only areas necessary to complete work. The standalone figure provided on PDF Page 24 still depicts the old limits of work and should be revised.**

- W5. Provide a preliminary plan for water control/dewatering of surface and groundwater during the construction of the crossing.

*GC: As outlined in the stream crossing protocol within this document, work, work shall not be performed during the wet period (i.e., March 1 to May 1) unless specified in writing by the conservation agent. Work shall be performed during low flow conditions and when the stream is as dry as possible to limit the need for dewatering to the extent feasible. However, the submitted Stormwater Pollution and Prevention Plan (SWPPP) provides the necessary information on dewatering protocols and inspections as required by the project.*

**BETA2: BETA recommends the Commission include a Special Condition in the Order of Conditions requiring the Applicant to submit a dewatering plan prior to the commencement of work for review and approval.**

- W6. It is recommended that the Commission include a Special Condition in the Order of Conditions (OOC) prohibiting any clearing of individual lots beyond what is depicted on the submitted plans until OOCs are issued for individual home construction.

*GC: Goddard Consulting is agreeable with this special condition.*

**BETA2: No further comment required.**

- W7. It is recommended that the Commission include a Special Condition in the OOC requiring the Applicant to furnish approvals from the Planning Board and the U.S. Army Corps of Engineers (USACE) prior to the preconstruction Site meeting.

*GC: No submission to the Planning Board is proposed because the subdivision is pre-existing. The wetland impact is under 5,000 sf, so no approval by the ACOE is required.*

**BETA2: Any impacts to Waters of the U.S. require authorization from USACE under the Section 404 Massachusetts General Permit. The Project would likely qualify as being eligible for Self-Verification due to the crossing meeting Stream Crossing Standards. BETA recommends that above-referenced Special Condition.**

## MITIGATION COMMENTS

W8. BETA offers the following comments on the wetland replication plan:

- a. The Applicant should provide best management practices for the contractor to limit the introduction and spread of invasive species.

*GC: BMPs will be undertaken throughout the construction of the project to limit the introduction and spread of invasive species on site. The contractor will be responsible for ensuring machinery and construction equipment is cleaned prior to being brought on-site. If invasive plant species are encountered during construction, plant material and impacted soils will be removed so as not to be reused on site.*

*Additionally, as outlined in the attached replication planting plan, any imported soils to be used within the replication area shall be clean fill. The project proposes two years of monitoring following construction to document the vitality and survival of the installed native plants and seedmix. During these inspections, invasive species, if present, are to be documented and removed.*

**BETA2: Comment addressed. BETA recommends the Commission include a Special Condition in the Order of Conditions requiring all invasive species that were not previously at the site to be documented and removed post construction. This should include a preliminary preconstruction survey to document any invasive species present.**

- b. The Applicant should provide the species list for the seed mix that is intended to be used within the replication area on the plans.

*GC: The project proposes to utilize New England Wetland Plants Wetmix within the proposed wetland replication area to re-establish a native wetland groundcover within the area.*

*As part of this supplemental submittal, Goddard has attached the species list provided by the supplier (common and scientific names) as well as wetland indicator statuses for each species found within the selected seedmix.*

**BETA2: The proposed seed mixes were not provided in the NOI submission. A Special Condition could be included in the Order of Conditions that requires submission of species lists prior to construction.**

- c. The location of the wetland replication area should be depicted on the plans.

*GC: The site plan has been updated to depict the location of the wetland replication area.*

**BETA2: Comment addressed.**

- d. The storage area proposed in the narrative for soil and leaf litter should be shown on the plans.

*GC: The site plan has been updated to depict the location for the soil and leaf litter stockpile locations.*

**BETA2: Comment addressed. Erosion controls should be depicted around the proposed stockpile location.**

- e. The Applicant should provide cross sections of altered and proposed replication areas, the replication plan, protocol and schedule should appear on the approved plan set and groundwater elevation data for the proposed replication area should appear on the plans (Bylaw Regulation Section 7.14.2)

*GC: A detail of the proposed wetland replication area has been added to the revised site plans, prepared by Diprete Engineering. The site plan detail includes the protocols for installation, detailing the existing wetlands, the proposed erosion controls, the required excavation and fill, as well as the proposed elevation of the wetland replication area.*

*In addition, Goddard prepared and provided a Wetland Replication Planting Plan, dated September 18, 2024, as part of the Notice of Intent submittal. The replication plan includes proper installation procedures, protocols, and timing.*

**BETA2: Groundwater elevations should be shown on the provided cross section of the replication area per BETA's original comment and Bylaw Regulation Section 7.14.2.**

- W9. The Applicant should provide a planting plan for disturbed portions of the right-of-way that are not proposed to be pavement. Specifically, areas within Buffer Zone should be prioritized for the planting of native street trees and the application of native seed mix.

*GC: As seen in the Construction Sequence prepared by Diprete Engineering, all disturbed areas outside of the paved limits are to be seeded and stabilized.*

*Goddard has prepared a visual markup of the site plans attached with this supplemental submittal to display the limits of the proposed seedmix. The project proposes to utilize New England Wetland Plants Conservation/Wildlife Seedmix for all disturbed areas. Goddard has attached the species list provided by the supplier (common and scientific names) as well as wetland indicator statuses for each species found within the selected seedmix.*

**BETA2: Comment partially addressed. The proposed seeding should be depicted on the full plan set for the contractor's knowledge, and it is recommended that native woody vegetation be planted along the roadway as appropriate (e.g., street trees). The Commission could consider a Special Condition in the Order of Conditions requiring the Applicant to submit a streetside planting plan once the Notices of Intent for the proposed lots are submitted so that the plan correlates with the proposed conditions along each lot.**

- W10. Provide a restoration plan for temporarily impacted Bank, BVW, and LUW.

*GC: Goddard recommends the following protocol be conditioned and adhered to during the installation of the required stream crossing to limit temporary impacts only to the extent required to install the crossing. As seen below, the protocol includes steps to restore all areas impacted during the installation, and requires monitoring for two years following installation to ensure all protocols have been followed, and that all portions of the area are functioning as designed and approved.*

*Stream Crossing Protocol*

- 1. The conservation agent shall be notified at least 72 hours (three full business days) prior to the start of work associated with the stream crossing.*
- 2. All work associated with the stream crossing shall be performed under the direct supervision of a qualified wetland scientist.*

3. *Work shall not be performed during the wet period (i.e., March 1 to May 1) unless specified in writing by the conservation agent. Work shall be performed during low flow conditions and when the stream is as dry as possible.*
4. *The erosion control barrier at the three-sided culvert location must be installed exactly as shown on the site plan. It is intended that the erosion control barrier be located just downgradient from the inner edge of the footing on both sides of the stream. Erosion controls shall not be placed within the stream channel or BVW.*
5. *The vegetation within the proposed driveway location near the crossing and the culvert footprint will be cut but not grubbed. The cut debris will be removed from the site.*
6. *Boulders will be carefully placed outside of the BVW on both sides of the stream. Road plates will be placed on the boulders to provide safe and stable access across the stream for a small excavator. The footing for the box culvert and wingwalls north of the stream will be excavated to firm bearing soil and the footing(s) poured or installed. The excavator will be moved back across the temporary crossing. The road plates will be removed. The boulders will be carefully removed and damaged soil areas within the culvert footprint will be repaired with loam. The footing for the box culvert and wingwalls south of the stream will be excavated to firm bearing soil and the footing(s) poured or installed. Damaged erosion controls will be replaced, as needed.*
7. *The box culvert and wing walls will be installed and backfilled. The area within the box culvert between the culvert and the erosion control barrier will be brought to proposed grade, compacted, and topped with rip-rap. This work is easier if the culvert were to be installed in three sections and each section backfilled and rip-rapped before the next section is installed. The rip-rap shall only be applied to the area between the erosion control barrier and the face of the culvert/wingwall as scour protection.*
8. *Place and compact in layers general fill and gravel fill for the driveway within and near the crossing to the grades shown.*
9. *Install proposed utility conduit(s) in a trench above the box culvert. Backfill and compact the fill within the utility trench. There shall be no trenching across the stream or BVW for utilities. Install the proposed guard rails.*
10. *Pave the proposed driveway at and near the crossing with base and top coat to the width shown on the site plan.*
11. *Loam and seed all disturbed areas at and near the wetland crossing which have not been stabilized. Apply and secure erosion control blankets to steep slopes in this area. Reseed as necessary until these areas are stabilized by vegetation.*
12. *The erosion controls at the crossing may be removed when directed to do so by the supervising wetland scientist with concurrence from the conservation agent.*
13. *The success of the crossing will be evaluated annually at the end of the growing season for two years after the crossing is installed to confirm that the proposed crossing, culvert, and the stream within and adjacent to the culvert is functioning per the approved design. A report, with representative photographs, shall be provided to the Commission after each inspection that details the condition of the area and any recommendation necessary to bring or keep the area in compliance with the approved plans and Order.*

**BETA2:** BETA recommends the Commission include a Special Condition in the Order of Conditions requiring the Applicant to ensure stream crossing and restoration occurs in the sequence that is stated by the Applicant, with the following revisions:

- Loam and seed shall be used to stabilize all upland areas, while temporarily impacted wetlands shall be restored to existing grade, top dressed with compost if deemed necessary, and seeded with a native wetland seed mixture;
- All temporarily disturbed Banks shall be restored to preexisting conditions; and
- No permanent LUW impacts shall occur within the footprint of the proposed 3-sided culvert.

### **WPA PERFORMANCE STANDARDS COMMENTS**

The Project proposes impacts to onsite Resource Areas and proposes wetland replication at a ratio of at least 2:1. The Applicant has also provided a narrative describing how the Project complies with Performance Standards set forth by the Act. The Applicant is filing this Project as a limited Project under the provision at 310 CMR 10.53(3)(e).

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

- W1. The plans do not provide the methods for restoring the temporarily impacted Banks. Provide a Bank restoration/stabilization plan for review.

*GC: As seen in the stream crossing protocol outlined above, Goddard has provided a full breakdown of the steps to be adhered to during the installation of the crossing. The stream crossing protocol includes steps to restore and stabilize all temporarily impacted banks, with additional monitoring included to ensure long-term success.*

**BETA2:** Proposed Bank restoration includes the placement of erosion control blankets on steep slopes and the application of seed. The Applicant should provide the specific seed mix that will be used on Bank.

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

- W2. The Applicant appears to have provided sufficient justification for why the wetland/stream crossing is necessary for the Project. Although the reported BVW impacts will likely decrease as a result of addressing BETA's comments, BETA recommends maintaining the size of the wetland replication area in order to safeguard from areas potentially failing. The Applicant should also provide a restoration plan for temporarily impacted BVW.

*GC: All disturbed BVW outside of the paved limits are to be seeded and stabilized. The seedmix will consist of New England Wetland Plants WetMix, which consists of native herbaceous wetland plants, naturalizing any BVW disturbance.*

**BETA2:** Comment addressed.

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

- W3. The Applicant should provide a summary of compliance with the LUW Performance Standards.

*GC: Land Under Water Bodies and Waterways refers to perennial stream bodies. The intermittent stream to be crossed on-site does not meet the requirements to be considered as Land Under Waters; therefore, the project is not held to these performance standards.*

*In addition, the stream crossing protocol provided by Goddard outlines the procedure to install the proposed crossing and avoid impacts to the streambed. By utilizing boulders and road plates, the excavator will cross the area without disturbing the streambed.*

**BETA2:** The boundary of LUW in the Act under 310 CMR 10.56(2)(c) is the mean annual low water level of waterbodies and waterways. As established by case law in the 2007 Final Decision In the Matter of Hoosac Wind Project (attached), “...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).

Regardless, the Applicant has quantified temporary impacts to LUW and has noted that no permanent LUW impacts would be required. The Project is presumed to comply with the LUW Performance Standards due to meeting the Massachusetts Stream Crossing Standards.

## BYLAW REGULATORY COMMENTS

- W4. Provide a Natural Heritage and Priority Habitats and Estimated Habitats Map, as required for NOI submissions to the Franklin Conservation Commission (Bylaw Section 7.17.1).

*GC: Goddard has provided a supplemental map detailing the nearest mapped Natural Heritage Priority Habitats and Estimated Habitats, dated 11/04/2024.*

*As seen in the attached map, no Priority or Estimated Habitats of Rare Wildlife are mapped on or adjacent to the project site. The nearest mapped habitat, PH 710, is located approximately 4200 feet to the West at closest from the project site.*

**BETA2: Comment addressed.**

- W5. The Applicant has provided a Variance request for work within BVW, Bank and the 0-25', 25-50', and 50-100' Buffer Zones in accordance with Bylaw Regulation Section 5. An alternative analysis was submitted within the Variance request but only consists of the proposed Project and a no build alternative. BETA defers to the Commission on the approval of the Variance request and whether other alternatives should be assessed. Based on BETA's review of the Site and its surroundings, it appears that other opportunities for access to the Site are limited.

*GC: Goddard Consulting has no additional comment to BETA W5.*

**BETA2: BETA defers to the Commission on the approval of the Variance request.**

- W6. The Applicant should provide a narrative with information on the steps taken to mitigate unavoidable impacts for work proposed within the Buffer Zones (Bylaw Regulation Section 7.11.2.). Plantings do not appear to be proposed within the cleared portions of Buffer Zone.

*GC: The applicant has submitted a variance request as part of the Notice of Intent submittal for the unavoidable impacts proposed within the Buffer Zones. As outlined in the variance request letter, in order to reach the associated uplands west of the BVW and intermittent stream, work within the BVW, Bank, 25, 50, and 100-Foot Buffer Zone is inevitable, requiring the proposed crossing.*

*The project has been filed as a Limited Project (reference section 4.3 of the Notice of Intent Cover Letter for compliance standards). The project has been designed to minimize impacts to the extent feasible to reach the suitable upland areas. A stream crossing protocol has been provided to*

*provide BMPs for the required crossing. All disturbed areas outside of the paved roadway and stormwater infrastructure are proposed to be reseeded with New England Wetland Plants Conservation Seedmix to restore all areas to a native groundcover. Wetland replication is proposed at a 2:1 rate.*

*The applicant has requested a variance to allow for the required work to install the roadway and drainage as shown by the attached site plans. As only the roadway itself and the drainage system are proposed as permanent impacts, the project has been designed to minimize and avoid any further impacts. It is the opinion of Goddard that the project has been minimized to the extent feasible, and the granting of a variance will allow the project to conform with all interests outlined by the local bylaw.*

**BETA2: BETA defers to the Commission on the provided narrative. Per BETA Comment W9, it is recommended that woody plantings also supplement the proposed seeding within disturbed Buffer Zone.**

- W7. Proposed erosion controls include silt fence and haybales. Silt fence is not a permitted erosion control measure in the Town of Franklin (Pg. 13 of Town of Franklin Best Development Practices Guidebook). The Applicant should coordinate with the Conservation Commission to determine the appropriate control measures for the Site. Twelve (12)-inch diameter compost filter tubes may be an appropriate option commensurate with the scope of the Project.

*GC: The proposed ECB has been updated to remove the silt fence and hay bales. A Twelve (12)-inch diameter compost filter tube is now proposed.*

**BETA2: Comment addressed.**

- W8. The Applicant should revise the Erosion & Sedimentation Control Plan to include contact information of the person(s) responsible for inspecting and maintaining erosion controls, the requirement to inspect erosion controls weekly or following significant rain events, and all other requirements listed in Section 7.12.1 of the Bylaw Regulations.

*GC: The project's Stormwater Pollution Prevention Plan (SWPPP) dated 9/18/24, prepared by Diprete Engineering, contains all inspection requirements and protocols as listed in Section 7.12.1 of the Bylaw Regulations.*

*As the project is under review at this time, the contact information of the person or party responsible for inspecting and maintaining erosion controls will be provided to the Conservation Agent prior to work beginning on-site.*

**BETA2: BETA recommends the Commission include a Special Condition within the Order of Conditions requiring the contract information of the person or party responsible for inspecting and maintaining erosion controls be provided prior to the commencement of work.**

- W9. BETA defers to the Commission on the approval of the Project Narrative due to several Bylaw requirements being absent from the current Project Narrative (Bylaw Regulation Section 7.9.1.) including who is performing the work and when the proposed activity will be done. This information could be submitted prior to construction as part of a Special Condition.

*GC: Goddard Consulting has no comment.*

**BETA2: See BETA's recommended Special Condition above.**

- W10. A Construction Sequence with all proposed construction activities should be included within the NOI and on the plan set (Bylaw Regulation Section 7.15.1). It is recommended that the Applicant also provide a standalone sequencing plan for the crossing construction.

*GC: Diprete Engineering provided a detailed Construction Sequence with the original Notice of Intent filing. The Construction Sequence is found within the submitted Stormwater Pollution and Prevention Plan (SWPPP) dated 9/18/2024. The Construction Sequence breaks the project into phases, providing sequencing and estimated dates of construction activities. This has been added to Sheet 3 of the updated site plan.*

**BETA2: Comment addressed. The Construction Sequence has been added to the Plan notes on Page 3 of 11.**

## STORMWATER MANAGEMENT

The Project proposes the construction of a proprietary separator, a series of catch basins, a sediment forebay, a sand filter and detention pond. Stormwater Best Management Practices (BMPs) are proposed to connect to each other in series to remove total suspended solids (TSS). Four catch basins are proposed to the east of the cul-de-sac within the access drive. Stormwater from these catch basins will be distributed into the associated sediment forebay, then detention pond to infiltrate.

A review of the Project's compliance with the Massachusetts Stormwater Management Standards and the applicable local Regulations is currently ongoing by Planning Board.

*GC: No submission to the planning board is proposed. Goddard and DiPrete defer to BETA Group and the Franklin Conservation Commission if there are any stormwater related peer review questions.*

**BETA2: Understood, the previous reference to Planning Board was erroneous. BETA previously provided a scope to review the stormwater management design, but it has been requested for inclusion as part of the Notice of Intent review due to the Project not requiring a filing with the Planning Board. BETA's comments are as follows:**

### GENERAL

- SW1. BETA notes that the hydrologic calculations assume a subdivision consisting of four residences of various sizes with a driveway and lawn area provided for each lot. These structures and impervious areas are not illustrated on the plans and it is assumed that the actual design of the residences may vary. In the event that the actual as-built residences differ significantly from design assumptions, the stormwater management system may need to be revised to accommodate a larger flow. BETA recommends the Commission consider a suitable condition to ensure the basins are properly sized for the final subdivision layout.
- SW2. Section 2.1 of the stormwater report identifies Charlton-Hollis-Rock outcrop complex as HSG D. However, the NRCS-WSS identifies this soil group as HSG B. Based upon the depth achieved in the test pits and the lack of exposed ledge shown on the plans, BETA recommends that the calculation be modified to reflect this soil classification.
- SW3. Consider providing a grate or similar measure at the 24" HDPE outlet (FES-11) to prohibit access by pedestrians and wildlife.
- SW4. Review HydroCAD model for Pond 121: Downstream Defender. A 15" HDPE outlet is used in the model, but a 12" HDPE outlet is proposed on the plans.

- SW5. Provide sizing calculations for catch basin grates.
- SW6. Recommend providing fencing around the detention basin system to discourage residents from entering the basins.
- SW7. Confirm the legal right to construct drainage infrastructure, including DMH-8, within the Mass Co. Electric Easement
- SW8. Indicate the current condition of the existing off-site detention pond to which the water quality unit will be routed.

### **STORMWATER MANAGEMENT REGULATIONS (CHAPTER 153)**

The Project proposes to disturb land in excess of one acre within the Town of Franklin. It is therefore subject to the Stormwater Management Regulations. The project is also required to comply with the Town of Franklin Best Development Practices Guidebook (BDPG). Compliance with these regulations is outlined below and throughout the following sections.

Refer to Standard 4 below for review comments related to Town treatment requirements.

- SW9. Provide detail for proposed swale and method of stabilization (§153-15.A.10).

### **BEST DEVELOPMENT PRACTICES GUIDEBOOK**

The project is required to comply with the requirements of the Town of Franklin Best Development Practices Guidebook (BDPG).

- SW10. Indicate if proposed seed mix and plantings will reflect native vegetation, particularly near woodland areas (BDPG Page 7).
- SW11. Confirm that landscaping plan has been designed in accordance with the planting bed and seeding guidelines outlined on Pages 14-15.

### **MASSDEP STORMWATER STANDARDS**

The Project is subject to §153-16 and the Massachusetts Wetlands Protection Act and therefore must comply with the Massachusetts Stormwater Standards as outlined by MassDEP. Compliance with these standards is outlined below:

- SW12. Provide stamp and signature on MassDEP Stormwater Checklist.

### **LOW IMPACT DEVELOPMENT (LID) TECHNIQUES**

The Project does not appear to propose any substantial LID measures.

**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 a new outfall which will discharge to the 50-ft buffer zone associated with the AWE-series wetlands. A riprap apron is proposed to mitigate erosion potential – **complies with standard.**

- SW13. Revise riprap apron size to match the outlet protection calculations, including a minimum size of 35' long x 41' wide with a d-50 of 11 inches.
- SW14. Demonstrate that the swale can convey anticipated flow rates with erosion. Controls such as check dams and a riprap lined outlet may be required to prevent scour at the discharge location.

- SW15. The existing conditions plan identifies several stone walls located immediately downgradient of the outfall location. Demonstrate that these stone walls will not substantially impede flow discharged from the outfall.
- SW16. Recommend providing a level spreader at the outfall to mitigate potential impact of concentrated discharge onto the abutting property and the wetland resource areas.
- SW17. Clarify if the “curb outlet weir” detail represents the overflow weirs for the sediment forebay and detention basin.

**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 to mitigate increases to runoff rates via a sand filter and detention basin. Calculations indicate a decrease in peak discharge rate and peak runoff volume to all the northeast wetland.

- SW18. Provide comparison or pre- and post-development peak discharge rate and runoff volume to design point 2: Ex Detention Pond. As no stormwater runoff is conveyed to this design point under existing conditions, a net increase in peak discharge rate and runoff volume is anticipated, in violation of Standard 2.
- SW19. Clarify the ultimate discharge location of the offsite detention pond. BETA notes that, if the peak discharge rates from both design points are combined, then the post-development, sitewide peak discharge rates exceed the pre-development, sitewide peak discharge rates. If the ultimate discharge location is the same for both points of analysis, then an additional point of analysis should be provided representing this final location.
- SW20. Provide HydroCAD subcatchment summaries, including cover type area breakdown and time of concentration calculations, for Wpre-01 and Wpre-02.
- SW21. Revise soil group for the southernmost portions of subcatchments WPre-02 and WPost-03. Based on NRCS soil mapping, this area is Hollis-Rock-outcrop-Charlton complex with HSGR D.
- SW22. Confirm that the limits of the areas modelled as “grass,” as depicted on the watershed plans, accurately reflect the likely limits of disturbance for each residence, accounting for grading required to construct residences along slopes.
- SW23. Clarify material to be used for drainage pond complex maintenance access and model cover type appropriately. Typically, gravel or similar stone material is used for maintenance paths.
- SW24. Revise cover type used for sand filter footprint to be impervious “Water Surface” to avoid “double-counting” the infiltration that will occur in this area.

**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 indicates the presence of Hollis-Rock outcrop-Charlton complex with Hydrologic Soil Group Rating (HSGR) C (low infiltration), Montauk fine sandy loam with HSGR C, and Charlton-Hollis-Rock outcrop complex with no assigned HSGR, though a rating of HSGR D has been assumed by the applicant (very low infiltration potential).

Test pits conducted at the Site indicate that subsurface soils are generally loamy sand or sandy loam. An infiltration rate of 2.41 in/hr has been utilized in the modelling of the Sand Filter, based on the Rawls Rate

for loamy sand. Groundwater was identified in the test pits based on the presence of redoximorphic features at depths ranging from 22" to 34" below grade.

Groundwater recharge is proposed via a new Sand Filter. The project is expected to provide a recharge volume in excess of what is required. BETA notes that Sand Filters do not typically receive a credit for groundwater recharge; however, due to the lack of an underdrain in the proposed system, the Sand Filter is anticipated to function similarly to an infiltration basin.

Calculations have been provided indicating that the Sand Filter will drawdown within 72 hours.

SW25. Recommend a condition that an agent of the town observe native soils after excavation for basins to confirm design assumptions.

SW26. The NRCS soil classification of HSG C conflicts with the loamy sand encountered in test pits near the sand filter. BETA recommends infiltration tests be conducted to verify infiltration rate.

SW27. In accordance with Volume 2, Chapter 2, page 59 of the handbook, the design infiltration rate for sand filters is 2.0 inches/hour. The design is based on a rate of 2.41 inches /hour and should be adjusted.

SW28. Test pits were completed on May 23, 2024, outside of the time of probable high groundwater elevation (November to April). (§153-15.A.9). The Sand Filter will have inadequate separation to groundwater if groundwater levels rise during the seasonal high period. Provide mounding analysis to demonstrate that the sand filter will function if the actual separation to groundwater is less than 2 feet.

SW29. Provide 2' separation to groundwater from the bottom of the sand filter sand layer, rather than from the bottom of pond. The sand layer is necessary to achieve the required storage volume for water quality and therefore must remain unimpeded by groundwater during storm events. BETA notes that a seasonal high GW elevation of 354.42' is listed on the table on Sheet 9, but an elevation of 355.42' is more accurate based on test pit DTH 24-6.

SW30. The detention basin grading includes cuts as great as 6 feet below existing grades which is greater than the 34" groundwater depth encountered in this area. Revise detention basin design such that the basin bottom is above the estimated seasonal high groundwater.

SW31. Include low permeability core in embankment for sediment forebay and sand filter to prevent seepage through the berm.

SW32. Revise outlet from sediment forebay to be at the bottom of the forebay to prevent permanent ponding in the forebay.

SW33. Provide drawdown calculations for the Detention Basin to confirm that the proposed low flow outlet can fully drain the basin within 72 hours.

SW34. Revise drawdown calculation for Sand Filter to use a drawdown rate matching the hydroCAD model, as drawdown will be restricted by native soils rather than the proposed sand layer. Per the MA Stormwater Handbook, V2C2 Page 59, design the sand filter to drawdown within 24 hours or less.

**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 includes the following treatment trains:

Treatment Train	SCM 1	SCM 2	Infiltration BMP	TSS Removal %
A	Deep Sump Catch Basin	Sediment Forebay	Sand Filter	80%
B	Deep Sump Catch Basin	None	Water Quality Unit	??%

The project has been designed to provide at least 80% TSS removal for treated impervious areas within the Sand Filter catchment.

Per §153-16, the project is required to either retain the 1.0 inch water quality volume or achieve 90% TSS removal and 60% total phosphorus removal. The narrative indicates that the intent is to retain the 1.0 inch water quality volume via the proposed Sand Filter. Treatment will also be provided via the water quality unit. The sand filter has been sized to treat the required water quality volume for its catchment area. However, no calculations have been provided for the water quality unit.

A Long Term Pollution Prevention Plan is included in the O&M Plan.

SW35. Provide TSS removal calculations for both treatment trains.

SW36. Revise TSS removal worksheet to exclude pretreatment devices; the 80% TSS removal provided by the sand filter is inclusive of required pretreatment.

SW37. Revise TSS removal worksheet to exclude the detention basin; stormwater runoff treated by the sand filter will be infiltrated into the ground and therefore additional treatment in the detention basin is not possible.

SW38. Provide water quality calculations for WQ-DM-17 demonstrating that it will remove at least 90% of TSS and 60% of total phosphorus (§153-16.A.1(a))

**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 includes residences and a private roadway which are not typically considered LUHPPLs – **standard not applicable.**

**CRITICAL AREAS (STANDARD NUMBER 6):** *Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas.*

The project is not located in a critical area – **standard not applicable.**

**REDEVELOPMENT (STANDARD NUMBER 7):** *Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable.*

The project does not qualify as 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.*

As the project proposes to disturb greater than one acre of land, a Notice of Intent will be required to file with EPA including development of a Stormwater Pollution Prevention Plan (SWPPP). Erosion control

measures are depicted on the plans including compost sock, construction entrance, and inlet protection. A draft SWPPP has been provided with the submission.

- SW39. Revise SWPPP to include the name, address, and telephone number of owner, civil engineer, and person responsible for implementation of the plan (§152-2.A).
- SW40. Provide perimeter controls along the stream near the stream crossing.
- SW41. Remove silt fence from the perimeter controls section of the SWPPP. Silt fence is not permitted as a perimeter control per the Town of Franklin BDPG.
- SW42. Provide seed mix and schedule for temporary/permanent stabilization, including how soon after disturbance these measures will be implemented. The SWPPP references “site stabilization” notes in the Site Plans, but BETA could not locate the referenced notes.
- SW43. Provide approximate location(s) of soil/material stockpile area on plans with erosion and sedimentation control measures to limit transport of materials. Areas should be located outside of buffer zones to the extent practicable.
- SW44. Clarify location of temporary sediment basins and swales identified in the SWPPP. A reference is made to the plans in Appendix A, but no site maps have been provided. If the proposed basin, sand filter, and sediment forebay are used as construction-period erosion controls, they must be thoroughly cleaned and restored prior to the end of construction.
- SW45. Revise sequencing plan to exclude infrastructure not applicable to the project, such as the underground infiltration system. Ensure that the detention basin, swale, and water quality unit are included in construction sequencing.

**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 Manual was provided with the Stormwater Management Report.*

- SW46. Indicate the Owner(s) of the stormwater management system, the names, addresses, and phone number of the person(s) responsible for operation and maintenance, and the person(s) responsible for financing maintenance and emergency repairs (§153-18.A & B). The provided O&M Plan indicates that an “Owners Association” will be created upon completion of construction, but such an association would presumably require future residences to be sold and occupied. An Owner who can meet the requirements of the Maintenance Agreement outlined in §153-18 should be identified to account for the event in which an “Owners Association” cannot be immediately formed at the completion of construction.
- SW47. Provide signature of owner on the O&M Plan (§153-18.B.5).
- SW48. Include provision in the O&M Plan requiring a documentation submittal to the DPW confirming when maintenance has been satisfactorily completed (§153-18.B.6).
- SW49. Revise the “transfer of ownership” section to include the requirements outlined in §153-18.D).
- SW50. Identify proposed snow storage areas on the plans and the O&M Exhibit.
- SW51. Include operation and maintenance requirements for the conveyance swale and the stream crossing and add to maintenance checklist.

Ms. Breeka Li Goodlander, Agent

November 21, 2024

Page 21 of 22

SW52. Verify that the detention basin can be safely access by a maintenance vehicle. Proposed grading for the sediment forebay and sand filter may impede access to the basin.

SW53. Clarify if a residence will be constructed on Lot 16 and evaluate the need for stormwater easements within this lot to access the pond complex.

SW54. Clarify operation and maintenance responsibilities for the existing detention pond and whether the owners of the proposed Lot 13 will share maintenance responsibility due to the proposed pipe connection to the Byron's Way drainage system.

**ILLICIT DISCHARGES (STANDARD NUMBER 10):** *All illicit discharges to the stormwater management system are prohibited.* An unsigned Illicit Discharge Compliance Statement was not provided with the submission. The narrative indicates that the statement will be provided prior to the discharge of any stormwater to post-construction BMPs.

SW55. BETA recommends that the signed illicit discharge compliance statement be provided during the permitting process.

## REVIEW SUMMARY

Based on our review of the NOI submittal and Project plans, the Applicant is required to provide the Conservation Commission with additional information to describe the Site, the work, and the effect of the work on the interests identified in the Act and the Bylaw. In addition, design revisions are required to demonstrate compliance with the Massachusetts Stormwater Standards.

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

Very truly yours,

BETA Group, Inc.



Anna Haznar  
Staff Scientist



Jonathan Niro  
Senior Project Scientist



Gary D. James, PE  
Senior Project Manager

cc: Amy Love, Town Planner

Ms. Breeka Lí Goodlander, Agent

November 21, 2024

Page 22 of 22

Bryan Taberner, AICP, Director of Planning & Community Development

Matt Crowley, P.E., BETA

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**

Travis Snell  
 One Main Street  
 Concord, MA 01742  
*Representing himself (Applicant)*

George & Kathleen Xenakis  
 55 Gifford Lane  
 Concord, MA 01742  
*Representing themselves (Petitioners/Abutters)*

McDara Fallon, Esq.  
 DEP- Office of General Counsel  
 One Winter Street - 3<sup>rd</sup> floor  
 Boston, MA 02108  
*Representing the Department*

cc: Jill Provencal  
 DEP - Northeast Regional Office  
 205B Lowell Street  
 Wilmington, MA 01887

Marcia Rasmussen  
 Concord Natural Resources Commission  
 141 Keyes Road  
 Concord, MA 01742

\* \* \* \* \*

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 years 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 response 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.

## SERVICE LIST

Gregor I. McGregor, Esq.  
Nathaniel Stevens, Esq.  
McGregor & Associates, P.C.  
15 Court Square, Suite 500  
Boston, MA 02108  
*Representing enXco, Incorporated (Applicant)*

James H. Wickersham, Esq.  
Noble & Wickersham, LLP  
1280 Massachusetts Avenue  
Cambridge, MA 02138  
*Representing enXco, Incorporated (Applicant)*

Robert O. Lucido II, Esq.  
Aaronson & Lucido, P.C.  
57 Wendell Avenue  
Pittsfield, MA 01201  
*Representing Ten Local Citizens Group (Rose Marie Gelinias, Jackie Field, Ted Field, Christine Richardson, Adam Richardson, Donald Wright, Tammy L. Wright, Chris Tatro, Derrick Wissman, Monica Wissman, Timothy L. Therrien and Tracie Therrien) (Petitioner) and Ten-Person Environmental Group (Intervenor)*

John C. Bartenstein, Esq.  
809 Massachusetts Avenue  
Lexington, MA 02420  
*Representing Ten Local Citizens Group (Rose Marie Gelinias, Jackie Field, Ted Field, Christine Richardson, Adam Richardson, Donald Wright, Tammy L. Wright, Chris Tatro, Derrick Wissman, Monica Wissman, Timothy L. Therrien and Tracie Therrien) (Petitioner) and Ten-Person Environmental Group (Intervenor)*

Elizabeth Kimball, Esq.  
DEP - Office of General Counsel  
One Winter Street, 3rd Floor  
Boston, MA 02108  
*Representing the Department*

James B. Art, Esq.  
 Donald R. Dubendorf, Esq.  
 Grinnell, Dubendorf & Smith LLP  
 One Bank Street  
 Williamstown, MA 01267  
*Representing the Conservation Commission*

cc: David Foulis  
 DEP - Western Regional Office  
 436 Dwight Street  
 Springfield, MA 01103

Conservation Commission  
 Town of Florida  
 367 Mohawk Trail  
 Drury, MA 01343

\* \* \* \* \*

---

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).