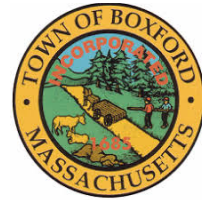

Notice of Intent
TEC Project File No. T0998

Proposed Culvert Replacement
Willow Road, Boxford, MA

Prepared for **Town of Boxford DPW**
7B Spofford Road
Boxford, MA 01921



Prepared by **TEC, Inc.**
146 Dascomb Road
Andover, MA 01810



August 6, 2020
Revised: August 12, 2020

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2 WETLAND DELINEATION REPORT

3 SUPPORTING MAPS AND DATA

4 PHOTO LOG

5 LOCAL FORMS AND CHECKLISTS

6 ABUTTERS INFORMATION

7 STORMWATER REPORT



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Boxford
City/Town

Important:

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

<u>Willow Road</u>	<u>Boxford</u>	<u>01921</u>
a. Street Address	b. City/Town	c. Zip Code
<u>Latitude and Longitude:</u>	<u>N 3,084,781</u>	<u>E 780,703</u>
	d. Latitude	e. Longitude
<u>f. Assessors Map/Plat Number</u>	<u>N/A - Culvert</u>	<u>g. Parcel /Lot Number</u>

2. Applicant:

<u>Christopher</u>	<u>Olbrot</u>	
a. First Name	b. Last Name	
<u>Town of Boxford DPW</u>		
c. Organization		
<u>7B Spofford Rd</u>		
d. Street Address		
<u>Boxford</u>	<u>MA</u>	<u>01921</u>
e. City/Town	f. State	g. Zip Code
<u>978- 352-6555</u>	<u>colbrot@town.boxford.ma.us</u>	
h. Phone Number	i. Fax Number	j. Email Address

3. Property owner (required if different from applicant): Check if more than one owner

<u></u>	<u></u>	
a. First Name	b. Last Name	
<u></u>		
c. Organization		
<u>t</u>		
d. Street Address		
<u></u>	<u></u>	<u></u>
e. City/Town	f. State	g. Zip Code
<u></u>	<u></u>	<u></u>
h. Phone Number	i. Fax Number	j. Email address

4. Representative (if any):

<u>Peter</u>	<u>Ellison</u>	
a. First Name	b. Last Name	
<u>TEC, Inc.</u>		
c. Company		
<u>146 Dascomb Road</u>		
d. Street Address		
<u>Andover</u>	<u>MA</u>	<u>01810</u>
e. City/Town	f. State	g. Zip Code
<u>978-794-1792</u>	<u>pellison@theengineeringcorp.com</u>	
h. Phone Number	i. Fax Number	j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

<u>Exempt</u>	<u>Exempt</u>	<u>Exempt</u>
a. Total Fee Paid	b. State Fee Paid	c. City/Town Fee Paid



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A. General Information (continued)

6. General Project Description:

Proposed project is a culvert replacement project on Willow Rd in Boxford, MA. Proposed project includes an open bottom three sided box culvert, precast concrete footing, wingwall and headwall for structural support. Please see the attached narrative and plan set for details.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

- 1. Single Family Home
- 2. Residential Subdivision
- 3. Commercial/Industrial
- 4. Dock/Pier
- 5. Utilities
- 6. Coastal engineering Structure
- 7. Agriculture (e.g., cranberries, forestry)
- 8. Transportation
- 9. Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

- 1. Yes No If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)
310 CMR 10.53(3)(i) "The maintenance, repair and improvement of structures, including...culverts which existed on ...April 1, 1983.

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

N/A - public roadway	
a. County	b. Certificate # (if registered land)
c. Book	d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

- 1. Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
- 2. Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.



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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input checked="" type="checkbox"/> Bank	59 LF (Temporary) 1. linear feet	76 LF 2. linear feet
b. <input checked="" type="checkbox"/> Bordering Vegetated Wetland	353 SF (Temporary) 1. square feet	353 SF 2. square feet
c. <input type="checkbox"/> Land Under Waterbodies and Waterways	_____ 1. square feet _____ 3. cubic yards dredged	_____ 2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. <input type="checkbox"/> Bordering Land Subject to Flooding	_____ 1. square feet _____ 3. cubic feet of flood storage lost	_____ 2. square feet _____ 4. cubic feet replaced
e. <input type="checkbox"/> Isolated Land Subject to Flooding	_____ 1. square feet _____ 2. cubic feet of flood storage lost	_____ 3. cubic feet replaced

- f. Riverfront Area
1. Name of Waterway (if available) - **specify coastal or inland** _____
2. Width of Riverfront Area (check one):
- 25 ft. - Designated Densely Developed Areas only
 - 100 ft. - New agricultural projects only
 - 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: _____ square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet _____ b. square feet within 100 ft. _____ c. square feet between 100 ft. and 200 ft. _____

5. Has an alternatives analysis been done and is it attached to this NOI? Yes No

6. Was the lot where the activity is proposed created prior to August 1, 1996? Yes No

3. Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f.** above.



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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	_____	
	1. square feet	

	2. cubic yards dredged	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	_____	_____
	1. square feet	2. cubic yards beach nourishment
e. <input type="checkbox"/> Coastal Dunes	_____	_____
	1. square feet	2. cubic yards dune nourishment

	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	_____	
	1. linear feet	
g. <input type="checkbox"/> Rocky Intertidal Shores	_____	
	1. square feet	
h. <input type="checkbox"/> Salt Marshes	_____	_____
	1. square feet	2. sq ft restoration, rehab., creation
i. <input type="checkbox"/> Land Under Salt Ponds	_____	
	1. square feet	

	2. cubic yards dredged	
j. <input type="checkbox"/> Land Containing Shellfish	_____	
	1. square feet	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	

	1. cubic yards dredged	
l. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	_____	
	1. square feet	

4. Restoration/Enhancement
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

_____ a. square feet of BVW _____ b. square feet of Salt Marsh

5. Project Involves Stream Crossings

_____ a. number of new stream crossings _____ b. number of replacement stream crossings



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C. Other Applicable Standards and Requirements

- This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

- 1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

- a. Yes No **If yes, include proof of mailing or hand delivery of NOI to:**

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

- 07/28/2020
 b. Date of map

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

- c. Submit Supplemental Information for Endangered Species Review*

- 1. Percentage/acreage of property to be altered:

(a) within wetland Resource Area	10% / 0.01 Acre
	percentage/acreage
(b) outside Resource Area	90% / 0.10 Acre
	percentage/acreage

- 2. Assessor's Map or right-of-way plan of site

- 2. Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **
 - (a) Project description (including description of impacts outside of wetland resource area & buffer zone)
 - (b) Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/>). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.



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C. Other Applicable Standards and Requirements (cont'd)

(c) MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/ mesa/ mesa_fee_schedule.htm).
Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

Projects altering 10 or more acres of land, also submit:

(d) Vegetation cover type map of site

(e) Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/ mesa/ mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. Separate MESA review ongoing. a. NHESP Tracking # _____ b. Date submitted to NHESP _____

3. Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. Not applicable – project is in inland resource area only b. Yes No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

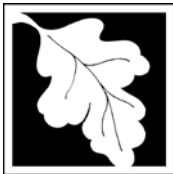
South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.



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Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

C. Other Applicable Standards and Requirements (cont'd)

- 4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
 a. Yes No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
 b. ACEC

- 5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
 a. Yes No
- 6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
 a. Yes No
- 7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
 a. Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
 - 1. Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
 - 2. A portion of the site constitutes redevelopment
 - 3. Proprietary BMPs are included in the Stormwater Management System.
 b. No. Check why the project is exempt:
 - 1. Single-family house
 - 2. Emergency road repair
 - 3. Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

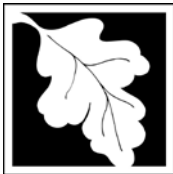
D. Additional Information

- This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

- 1. USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
- 2. Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.



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D. Additional Information (cont'd)

3. Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. List the titles and dates for all plans and other materials submitted with this NOI.

Culvert Replacement Plans (10 sheets, 24"x36")

a. Plan Title

TEC, Inc.

Peter F. Ellison, PE

b. Prepared By

c. Signed and Stamped by

8/12/2020

1"=20'

d. Final Revision Date

e. Scale

f. Additional Plan or Document Title

g. Date

5. If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. Attach NOI Wetland Fee Transmittal Form

9. Attach Stormwater Report, if needed.

E. Fees

1. Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number

3. Check date

4. State Check Number

5. Check date

6. Payor name on check: First Name

7. Payor name on check: Last Name



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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

	<u>08-05-20</u>
1. Signature of Applicant	2. Date

3. Signature of Property Owner (if different) 	4. Date 8-6-2020
5. Signature of Representative (if any)	6. Date

For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.



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NOI Wetland Fee Transmittal Form
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Location of Project:

Willow Rd a. Street Address	Boxford b. City/Town
Exempt c. Check number	Exempt d. Fee amount

2. Applicant Mailing Address:

Christopher a. First Name	Olbrod b. Last Name	
Town of Boxford DPW c. Organization		
7B Spofford Rd d. Mailing Address		
Boxford e. City/Town	MA f. State	01921 g. Zip Code
(978) 352-6555 h. Phone Number	 i. Fax Number	colbrod@town.boxford.ma.us j. Email Address

3. Property Owner (if different):

 a. First Name	 b. Last Name	
 c. Organization		
 d. Mailing Address		
 e. City/Town	 f. State	 g. Zip Code
 h. Phone Number	 i. Fax Number	 j. Email Address

B. Fees

Fee should be calculated using the following process & worksheet. **Please see Instructions before filling out worksheet.**

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract \$12.50. To calculate the city/town share of the fee, divide the total fee in half and add \$12.50.

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).



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B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 4(f)	1	Exempt	Exempt
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Step 5/Total Project Fee:			Exempt
Step 6/Fee Payments:			
Total Project Fee:			Exempt
			a. Total Fee from Step 5
State share of filing Fee:			b. 1/2 Total Fee less \$12.50
City/Town share of filing Fee:			c. 1/2 Total Fee plus \$12.50

C. Submittal Requirements

- a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
 Box 4062
 Boston, MA 02211

- b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

1 NARRATIVE

INTRODUCTION AND PURPOSE

The project proposes to replace an existing 24" diameter corrugated metal culvert located on Willow Road in Boxford, adjacent to private property 89 Willow Road. The existing culvert is in poor condition with partially collapsed stone reinforcement on both ends. Culvert pipes are deteriorating and partially filled with sediment, resulting in reduced capacity and limiting wildlife passage. The present condition of the culvert causes drainage and flood problems in the surrounding area.

The purpose of this project is to replace the existing dysfunctional culvert and provide a new culvert that functions properly, improves the flood condition of the surrounding area during heavy rain, and meets the Massachusetts Stream Crossing Standards to the maximum extent practicable. The proposed project also improves the roadway safety by preventing any future collapse of the culvert or roadway sinking and provides modern guard rails.

EXISTING CONDITIONS

Willow Road is approximately 25-feet in paved width with gravel shoulders and roadside drainage swales on either side. Willow Road is considered as an urban minor arterial. The runoff from Willow Road flows off the roadway into the adjacent swales on the sides of the road and eventually flows into the intermittent stream. There are no existing utilities under the roadway.

The existing culvert is a 24" corrugated metal pipe (CMP) that stretches approximately 42-feet in length, running south-to-north into Parker Brook under Willow Road. The construction year of the culvert is unknown, however, based on the deterioration TEC assumes the culvert was constructed 30+ years ago. There is stone headwall on both sides of the culvert which have partially collapsed and lost structural integrity. A guard rail exists on the north side of the culvert; however, it is in poor condition. There is approximately 5 ft of cover on the top of the existing CMP.

The tributary flowing through the culvert is unnamed. Based on available USGS maps, the stream is shown as an intermittent with a "dashed" linetype. The USGS StreamStats software shows that the tributary has a watershed area of 0.2 square miles, well below the threshold to be qualified as a perennial stream (1.0 square mile). The tributary ultimately discharges to the Parker River about 0.5 miles north of the culvert. The banks of the tributary are well defined on both sides of the culvert and the stream channel is about 3 ft wide. Both the north and south side of Willow Road within the project location contains bordering vegetative wetlands. The north side of the culvert is located adjacent to Priority and Estimated Habitat of Rare Wildlife and Species. There is no 100-year flood plain mapped within vicinity of the project.

PROPOSED IMPROVEMENTS

The project proposes to remove the existing 24" CMP and replace it with a new open bottom, 3-sided concrete box culvert, matching the location of the existing culvert. The proposed culvert

is 11 ft wide with 9 ft clear span and there is a 4 ft rise from the bottom of the streambed. The culvert is made of precast concrete and sits on a spread footing foundation system for support. The proposed footing goes approximately 4.5 feet below ground to provide support from freeze and thaw cycles. A wingwall and headwall have been proposed for additional structural support on both ends, which will be constructed parallel to the roadway to minimize disturbance into adjacent wetlands.

The proposed inlet elevation of the culvert is 107.3 upstream, and 105.7 downstream which matches approximately the existing culvert elevations. The proposed stream bed elevation at the center is 106.5 and maintains a 4.1% slope. A layer of 24" rockfill and crushed stone has been proposed to stabilize the stream bed as well as the culvert foundation. The crushed stone will be placed beneath one foot of natural materials will be removed from the top layer of the stream bed and stored onsite. The natural streambed material will be re-used within the new three-sided concrete culvert and within the existing streambed that will be temporarily disturbed during construction. The stream bed will taper at the edge of the culvert to provide dry wildlife passage.

Full depth pavement has been proposed above the culvert while maintaining 1.9 ft of cover. The proposed roadway grade above the culvert matches existing grades.

Existing CMP pipes and other structures associated with the culvert will be completely removed. A temporary cofferdam has been proposed to prevent the stream flowing through the construction site. Water trapped within the limit of work will be pumped into a stilling basin to catch any sediments and release back to the stream. The final control of water plan will be designed by the contractor and reviewed and approved by TEC as part of a shop drawing review process.

The project improves current flood conditions at the project location by better accommodating the stream flow while following the MA Stream Crossing Standard to protect the existing stream features. It also increases roadway safety by preventing any future breaking or sinking of the roadway due to a larger failure of the existing culvert.

STREAM CROSSING STANDARDS

The project proposes to meet the Massachusetts Stream Crossing Standards to the maximum extent practicable. The following is an analysis of the Stream Crossing "General Standards" for the proposed culvert:

Goal: Fish passage, river/stream continuity, some wildlife passage

The new culvert is proposed as 11 ft wide with 9 ft clear span and about 4 ft rise from the stream bed. It also maintains a 4.1% slope and stream bed is tapered at the edge of the culvert wall. Proposed culvert provides an improved openness ratio and supports improved wildlife and fish passage over existing conditions. Proposed open bottom of the culvert preserves stream's natural continuity. The proposed culvert provides an openness ratio of 1.27 ft, exceeding the "minimum" guidance of the Stream Crossing Standards.

Goal: 1. Spans that preserve the natural stream channel are strongly preferred

Proposed culvert is a 3-sided box culvert with open bottom which preserves the natural stream channel.

Goal: 2. If a culvert, it should be embedded.

Proposed culvert has an open bottom with a natural stream bed.

Goal: 3. Spans channel width (a minimum of 1.2 times the bankfull width)

The project provides a span width of 9 feet which is 1.29 times the bankfull width and meets the minimum standard of 1.2. The existing bankfull width of 7 feet was determined by field measurements according to USGS guidance.

Goal: 4. Natural bottom substrate within structure

A natural bottom substrate was maintained by proposing an open bottom culvert.

Goal: 5. Designed with appropriate bed forms and streambed characteristics so that water depths and velocities are comparable to those found in the natural channel at a variety of flows.

As noted above, proposed culvert has an open bottom and maintains similar invert elevation both upstream and downstream as the existing one. Which means it will maintain a similar depth of flow and velocity of the upstream and downstream conditions.

Goal: 6. Openness > 0.82 feet

According to the hydraulic report, current openness ratio of the existing culvert is 0.075 feet. The proposed culvert improves the openness ratio significantly and provides a new ratio of 1.27 feet.

Cross section area of culvert = 9' x 4' = 36 square feet

Length of culvert = 28.33 feet

36 sf / 28.33 feet = 1.27 feet > 0.82 feet

Goal: 7. Banks should be present on each side of the stream matching the horizontal profile of the existing stream and banks

The proposed stream bed restoration includes tapered banks to match into the existing shape of the stream. The stream bed restoration will allow fish passage and tapered banks will allow upland wildlife crossing. The horizontal profile will match the inverts of the existing culvert to retain existing flow patterns.

Overall, the project has met the Stream Crossing Standards to the maximum extent practicable.

RESOURCE AREAS

Resource areas on or adjacent to the project site were delineated and flagged by Rimmer Environmental Consulting (Rimmer) on May 29, 2020 and are summarized in a Wetland Resource Delineation Report dated June 16, 2020. The full report and field forms can be found attached in Section 2 of this report.

Resource areas mentioned in Rimmer's report include Inland Bank and Bordering Vegetated Wetland. The project has been designed to eliminate permanent impacts to existing wetland resource areas. In order to accomplish this, the overall length of the culvert has been shortened to pull back the outlets. Resource areas are described in greater detail below:

BORDERING VEGETATED WETLANDS (BVW)

Along both upstream and downstream portion of the project boundary, bordering vegetated wetland (BVW) are present. The BVW on the south side (upstream) was delineated by wetland flags A1-A9 and BVW on the north side (downstream) was delineated by wetland flags B1-B10. BVW primarily consist of red maple (*Acer rubrum*), American elm (*Ulmus Americana*), skunk cabbage (*Symplocarpus foetidus*) and cinnamon fern (*Osmunda cinnamomea*). The adjacent upland from the BVW consists of eastern white pine (*Pinus strobus*), northern red oak (*Quercus rubra*), and poison ivy (*Toxicodendron radicans*).

Impacts to the BVW are limited to 353 SF of temporary impacts due to access, grading and erosion control barriers during construction. Any disturbance to the BVW will be fully restored once construction is completed. The top layer of soil within the disturbed BVW area will be stored onsite and re-used to match existing conditions.

Work is proposed within the 25-foot no disturb zone associated with the BVW. Unfortunately, the nature of the work being a culvert replacement project requires that the contractor must enter into this no disturb zone. The wetland resource areas are directly adjacent to the existing culvert and it would be infeasible to avoid entering the buffer zone.

INLAND BANK

There is an unnamed stream indicated as intermittent on the USGS topographic map that flows into the culvert. Stream banks were delineated by flags 1-6 upstream and downstream by flags 7-10. A 100-foot buffer zone extends from the bank.

The project will result in 59 linear feet of temporary impacts to the Inland Bank. The temporary impacts to the bank are due access, grading and erosion control barriers during construction. A temporary cofferdam will be required in order to dewater the existing stream within the work zone. The top layer of soil within the existing streambed will be stored onsite and re-used to match existing conditions.

OTHER RESOURCES

According to publicly available online resources, and published by MassGIS, the north side of the project limit is located within Estimated Habitat of Rare Wetland Wildlife or Priority Habitat as defined by the Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program. A MESA project checklist has been filed simultaneously with this Notice of Intent to confirm that the project will not result in a take of rare species habitat.

CONSTRUCTION SEQUENCE

The following sequence is a general overview of the proposed project; however, this may be modified based on input from the Conservation Commission (ConCom).

1. Obtain Order of Conditions from ConCom, and secure all needed permitting.
2. Pre-construction meeting with ConCom agent, the Engineer, and the Town.
3. Install erosion control barriers downgradient of proposed construction area.
4. Perform general site prep, temporary roadway closure signs and barrier.
5. Designate alternative route and install necessary signs.
6. Perform sawcut, excavation and any other earthwork.
7. Install cofferdam, install stilling basin, and pump out any trapped water from the project area into the stilling basin.
8. Complete construction of the footing, culvert, stream bed, fill and repave the section of the road above the culvert.
9. Install loam and seed to stabilize disturbed areas outside of the wetland limits.
10. Install necessary signs.
11. Remove cofferdam and stilling basin.
12. Perform final inspection and address punch list items.
13. Final acceptance by the Town.
14. Obtain Certificate of Compliance from ConCom.
15. Remove erosion control barriers.

MITIGATION

Prior to construction, erosion control and sedimentation barriers will be installed between the project area and the adjacent stream as well as the project area and surrounding properties to establish a limit-of-work. See attached construction plan for the location and detail of the erosion control barriers. Erosion control barriers will not be removed until site is completely stabilized.

Temporary impacts to the bordering vegetated wetland and inland bank will be required in order to construct the proposed culvert. A total of 353 SF of BVW and 59 LF of bank impacts are proposed temporarily. The banks will be restored to their original condition upon completion of the project. Reducing the length of the culvert will increase the length of the

“open air” stream bed, resulting in additional inland bank creation. Overall the project will provide 76 LF of inland bank outside the limits of the culvert. Within the culvert itself, banks will be constructed to match the shape and condition of the existing streambed. An additional 56 LF of inland bank will exist within the culvert. It is assumed that no inland bank exists within the existing culvert because it is in such poor condition and has partially collapsed.

The project will provide a drastic improvement to the stream conditions by providing a roadway crossing that meets the Massachusetts Stream Crossing Standards. The culvert will allow for fish and upland wildlife passage, and will increase overall capacity of the existing structure to reduce the risk of localized flooding. From a conservation perspective, the proposed project will provide a tremendous improvement to the intermittent stream and surrounding wetlands/forest area.

Any impact to the resource area will be restored upon completion of the construction. The proposed project does not have any permanent impact on any of the surrounding resource area.

CONCLUSION

The proposed culvert replacement project includes replacing the existing culvert that is in a poor condition with a new three-sided box culvert with a natural stream bed. The proposed project includes precast concrete footing, wingwall, headwall and guardrail to provide structural support and roadway safety at the project location. The project upholds the Massachusetts Stream Crossing Standards and better accommodates the stream flow passing through the culvert while causing no permanent impacts to the surrounding resource areas.

The Applicant requests that the Conservation Commission find that the project as described in this Notice of Intent application successfully upholds the interest of the Wetlands Protection Act and local bylaws, and subsequently issues an Order of Conditions for the proposed project.

2 WETLAND DELINEATION REPORT



Wetland Resource Delineation Report Route 133/Willow Road Culvert Replacement Boxford, MA June 16, 2020

The project area includes a culvert proposed for replacement in the vicinity of 86 Willow Road in Boxford, MA as indicated in Figure 1 below. Rimmer Environmental Consulting (REC) conducted a field inspection of the project area on May 29, 2020. At that time, wetland resources subject to jurisdiction under the Massachusetts Wetlands Protection Act (MGL Ch 131 §. 40) and the Town of Boxford Wetlands Protection Bylaw within and immediately adjacent to the project area were identified.

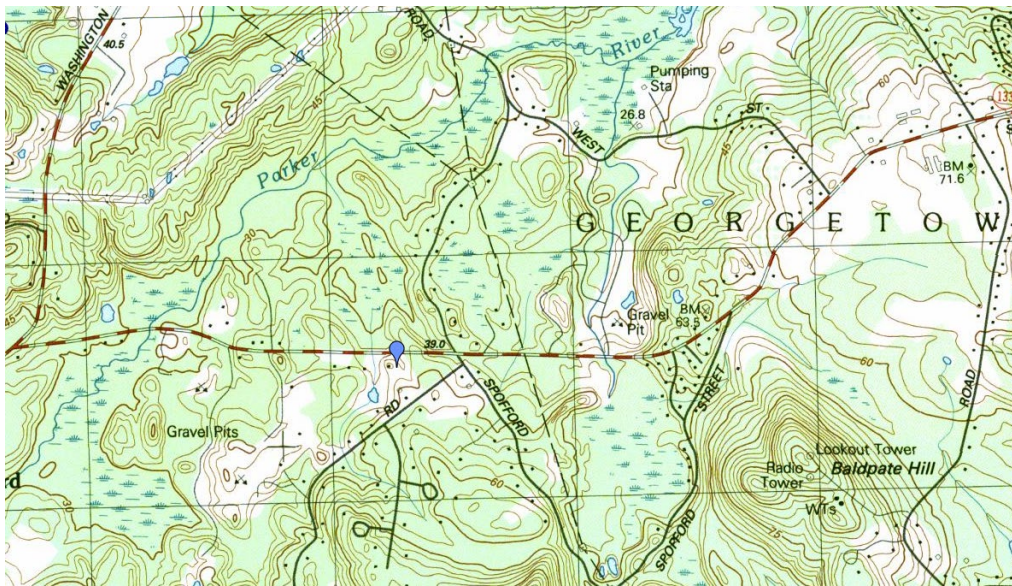


Fig.1: Project Locus

The following wetland resources were observed and delineated within the project site.

Bordering Vegetated Wetland (BVW)

There is forested wetland along the shoulder of Willow Road on both the north and south sides of the culvert. The wetland on the south (upstream) side was delineated as BVW by flags A1-A9 and on the north (upstream) side by flags B1-B10. The wetland consists of an overstory of red maple (*Acer rubrum*) and American elm (*Ulmus americana*) with an understory of skunk cabbage

(*Symplocarpus foetidus*) and cinnamon fern (*Osmunda cinnamomea*). The adjacent upland consists of eastern white pine (*Pinus strobus*), northern red oak (*Quercus rubra*), and poison ivy (*Toxicodendron radicans*). MassDEP Bordering Vegetated Wetland Delineation Field Data Forms are attached to provide additional documentation of the BVW boundary. There is a 100-foot Buffer Zone extending from these flags.

Inland Bank

There is a stream within the BVW described above which directs flow into the culvert. The stream is indicated as intermittent on the USGS topographic map shown as Figure 1 above. The upstream Banks were delineated by flags 1-6 and downstream by flags 7-10. The Banks are fairly well defined on both sides of an approximately 3-foot wide channel.

USGS StreamStats indicates the stream has a drainage area at the culvert of 0.2 square miles (see attached), which is well below the threshold for qualifying as a perennial stream.



Other Resources

The north side of Willow Road within the project site is located within Priority Habitat and Estimated Habitat of Rare Wetlands as determined by reference to the most recently available data from the Massachusetts Division of Fisheries and Wildlife – Natural Heritage and Endangered Species Program available on MassGIS shown as Figure 2 below.

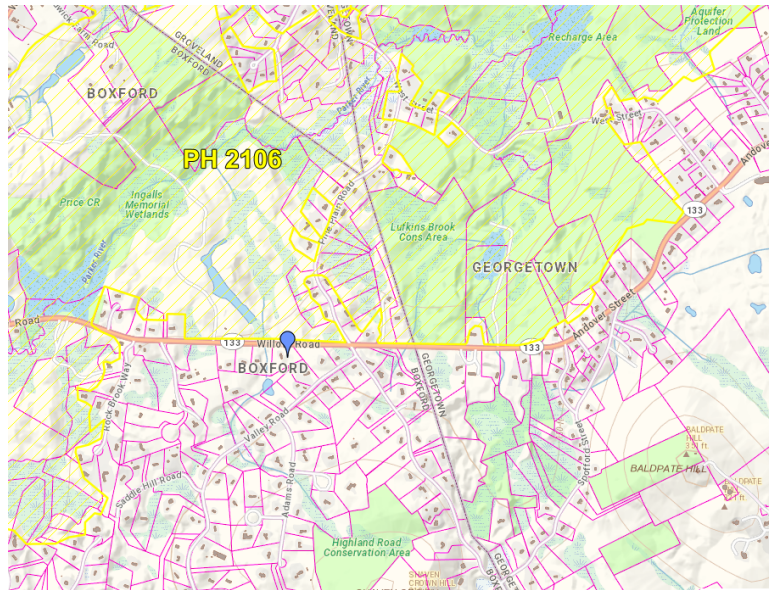


Fig. 2: NHESP Priority Habitat

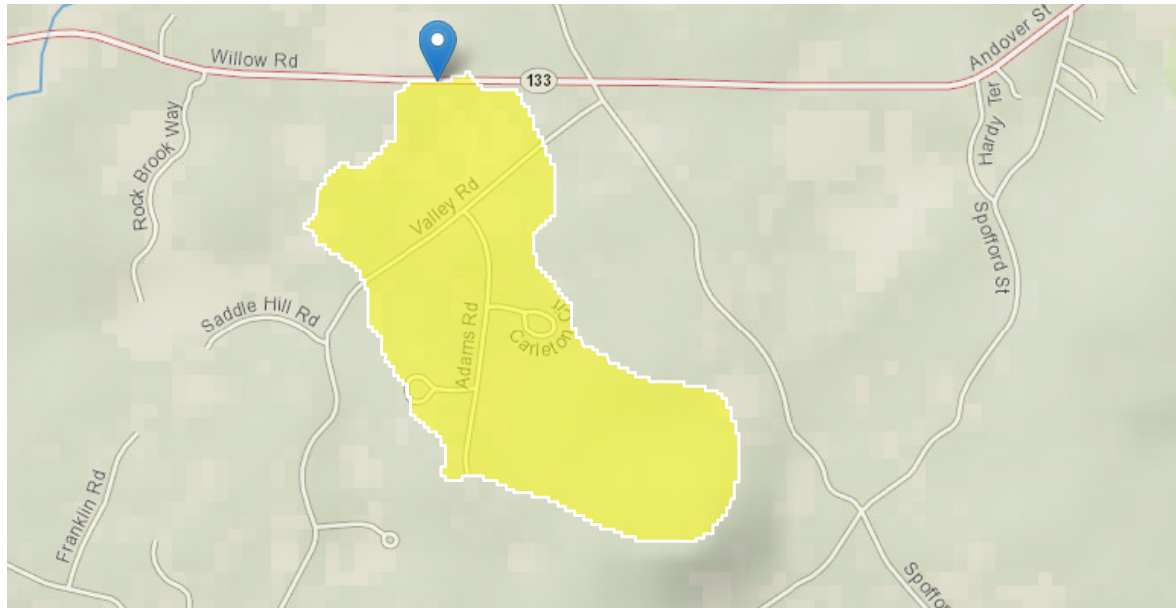
Culvert at 86 Willow Road, Boxford

Region ID: MA

Workspace ID: MA20200616152543507000

Clicked Point (Latitude, Longitude): 42.71183, -71.03661

Time: 2020-06-16 11:26:03 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.2	square miles
DRFTPERSTR	Area of stratified drift per unit of stream length		square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless
BSLDEM250	Mean basin slope computed from 1:250K DEM		percent

Flow-Duration Statistics Parameters^[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.2	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length		square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM		percent	0.32	24.6

Flow-Duration Statistics Flow Report^[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit
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DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: _____ Prepared by: REC Project location: Box-86Willow DEP File #: _____

Check all that apply:

- Vegetation alone presumed adequate to delineate BWV boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BWV boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

Vegetation Observation Plot Number: _____ Transect Number: _____ Date of Delineation: _____
 A. Sample Layer & Plant Species B. Percent Cover (or basal Area) C. Percent Dominance D. Dominant Plant (yes or no) E. Wetland Indicator Category*

A7

Upland

5/29/2020

Canopy / Acer rubrum / Red Maple	63	100	<input checked="" type="checkbox"/> Yes	FAC
Sapling / Ulmus americana / American Elm	85.5	100	<input checked="" type="checkbox"/> Yes	FACW
Groundcover / Toxicodendron radicans / Eastern Poison-Ivy	38	100	<input checked="" type="checkbox"/> Yes	FAC
			<input type="checkbox"/> Yes	

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c. 131, s. 40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 3

Number of dominant non-wetland indicator plants: 0

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? Yes No

If vegetation alone is presumed adequate to delineate the BWV boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? yes no
 title/date:
 map number:
 soil type mapped:
 hydric soil inclusions:

Are field observations consistent with soil survey? yes no
 Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
A	1-5 10YR 2/2		
B	5-16 10YR 5/6		

Remarks:

3. Other:

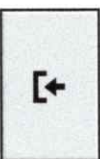
Conclusion: Is soil hydric? Yes No

Other Indicators of Hydrology: (check all that apply & describe)

- Site Inundated: _____
- Depth to free water in observation hole: _____
- Depth to soil saturation in observation hole: _____
- Water marks: _____
- Drift lines: _____
- Sediment Deposits: _____
- Drainage patterns in BVW: _____
- Oxidized rhizospheres: _____
- Water-stained leaves: _____
- Recorded Data (streams, lake, or tidal gauge; aerial photo; other): _____
- Other: _____

Vegetation and Hydrology Conclusion

- Number of wetland indicator plants > # of non-wetland indicator plants: Yes No
- Wetland hydrology present: Yes No
- Hydric soil present: Yes No
- Other indicators of hydrology present: Yes No
- Sample location is in a BVW: Yes No



DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: _____ Prepared by: REC / Project location: Box-86 Willow DEP File #: _____

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

Vegetation Observation Plot Number: _____ Transect Number: _____ Date of Delineation: _____
 A. Sample Layer & Plant Species B. Percent Cover (or basal Area) C. Percent Dominance D. Dominant Plant (yes or no) E. Wetland Indicator Category*

A7	Wetland	5/29/2020		
Sapling / Ulmus americana / American Elm	63	100	<input checked="" type="checkbox"/> Yes	FACW
Groundcover / Symplocarpus foetidus / Skunk-Cabbage	38	50	<input checked="" type="checkbox"/> Yes	OBL
Groundcover / Osmunda cinnamomea / Cinnamon Fern	38	50	<input checked="" type="checkbox"/> Yes	FACW
			<input type="checkbox"/> Yes	

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c. 131, s. 40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 3

Number of dominant non-wetland indicator plants: 0

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? Yes No

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Other Indicators of Hydrology: (check all that apply & describe)

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? yes no
 title/date:
 map number:
 soil type mapped:
 hydric soil inclusions:

Are field observations consistent with soil survey? yes no
 Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
A	1-7 10YR 2/1		
B	7-12 10YR 4/2		

Remarks:

3. Other:

Conclusion: Is soil hydric? Yes No

Site Inundated: _____

Depth to free water in observation hole: _____

Depth to soil saturation in observation hole: 1"

Water marks: _____

Drift lines: _____

Sediment Deposits: _____

Drainage patterns in BVW: _____

Oxidized rhizospheres: _____

Water-stained leaves: _____

Recorded Data (streams, lake, or tidal gauge; aerial photo; other): _____

Other: _____

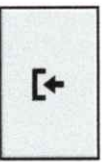
Vegetation and Hydrology Conclusion

Number of wetland indicator plants > # of non-wetland indicator plants: Yes No

Wetland hydrology present: Hydric soil present Yes No

Other indicators of hydrology present Yes No

Sample location is in a BVW Yes No



DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: _____ Prepared by: REC Project location: Box-86Willow DEP File #: _____

Check all that apply:

- Vegetation alone presumed adequate to delineate BWV boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BWV boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

Vegetation Observation Plot Number: _____ Transect Number: _____ Date of Delineation: _____
 A. Sample Layer & Plant Species B. Percent Cover (or basal Area) C. Percent Dominance D. Dominant Plant (yes or no) E. Wetland Indicator Category*

B3 Upland 5/29/2020

Canopy / Pinus strobus / Eastern White Pine	38	100	<input checked="" type="checkbox"/> Yes	FACU
Sapling / Quercus rubra / Northern Red Oak	38	100	<input checked="" type="checkbox"/> Yes	FACU
Groundcover / Toxicodendron radicans / Eastern Poison-Ivy	63	86	<input checked="" type="checkbox"/> Yes	FAC
Groundcover / Symplocarpus foetidus / Skunk-Cabbage	10.5	14	<input type="checkbox"/> Yes	OBL
			<input type="checkbox"/> Yes	

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW-, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 1 Number of dominant non-wetland indicator plants: 2

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? Yes No

If vegetation alone is presumed adequate to delineate the BWV boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? yes no
 title/date:
 map number:
 soil type mapped:
 hydric soil inclusions:

Are field observations consistent with soil survey? yes no
 Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
A	0-7 10YR 2/2		
B	7-14 10YR 5/6 sand dry		

Remarks:

3. Other:

Conclusion: Is soil hydric? Yes No

Other Indicators of Hydrology: (check all that apply & describe)

- Site Inundated: _____
- Depth to free water in observation hole: _____
- Depth to soil saturation in observation hole: _____
- Water marks: _____
- Drift lines: _____
- Sediment Deposits: _____
- Drainage patterns in BW: _____
- Oxidized rhizospheres: _____
- Water-stained leaves: _____
- Recorded Data (streams, lake, or tidal gauge; aerial photo; other): _____
- Other: _____

Vegetation and Hydrology Conclusion

- Number of wetland indicator plants Yes No
- > # of non-wetland indicator plants: Yes No
- Wetland hydrology present: Yes No
- Hydric soil present Yes No
- Other indicators of hydrology present Yes No
- Sample location is in a BW Yes No



DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: _____ Prepared by: REC Project location: Box-86Willow DEP File #: _____

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

Vegetation Observation Plot Number: _____ Transect Number: _____ Date of Delineation: _____
 A. Sample Layer & Plant Species B. Percent Cover (or basal Area) C. Percent Dominance D. Dominant Plant (yes or no) E. Wetland Indicator Category*
 (by common/scientific name)

B3 Wetland 5/29/2020

Shrub / Sambucus nigra / Black Elder	20.5	100	<input checked="" type="checkbox"/> Yes	FACW
Groundcover / Symplocarpus foetidus / Skunk-Cabbage	63	75	<input checked="" type="checkbox"/> Yes	OBL
Groundcover / Osmunda cinnamomea / Cinnamon Fern	20.5	25	<input checked="" type="checkbox"/> Yes	FACW
			<input type="checkbox"/> Yes	

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 3 Number of dominant non-wetland indicator plants: 0

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? Yes No

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? yes no
 title/date:
 map number:
 soil type mapped:
 hydric soil inclusions:

Are field observations consistent with soil survey? yes no

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
A	0-5 10YR 2/2		5/8 10YR
B	5-14 10YR 5/6		6/8 10YR
			Sand with large

Remarks:

3. Other:

Conclusion: Is soil hydric? Yes No

Other Indicators of Hydrology: (check all that apply & describe)

- Site Inundated: _____
- Depth to free water in observation hole: _____
- Depth to soil saturation in observation hole: _____
- Water marks: _____
- Drift lines: _____
- Sediment Deposits: _____
- Drainage patterns in BVW: _____
- Oxidized rhizospheres: _____
- Water-stained leaves: _____
- Recorded Data (streams, lake, or tidal gauge; aerial photo; other): _____
- Other: _____

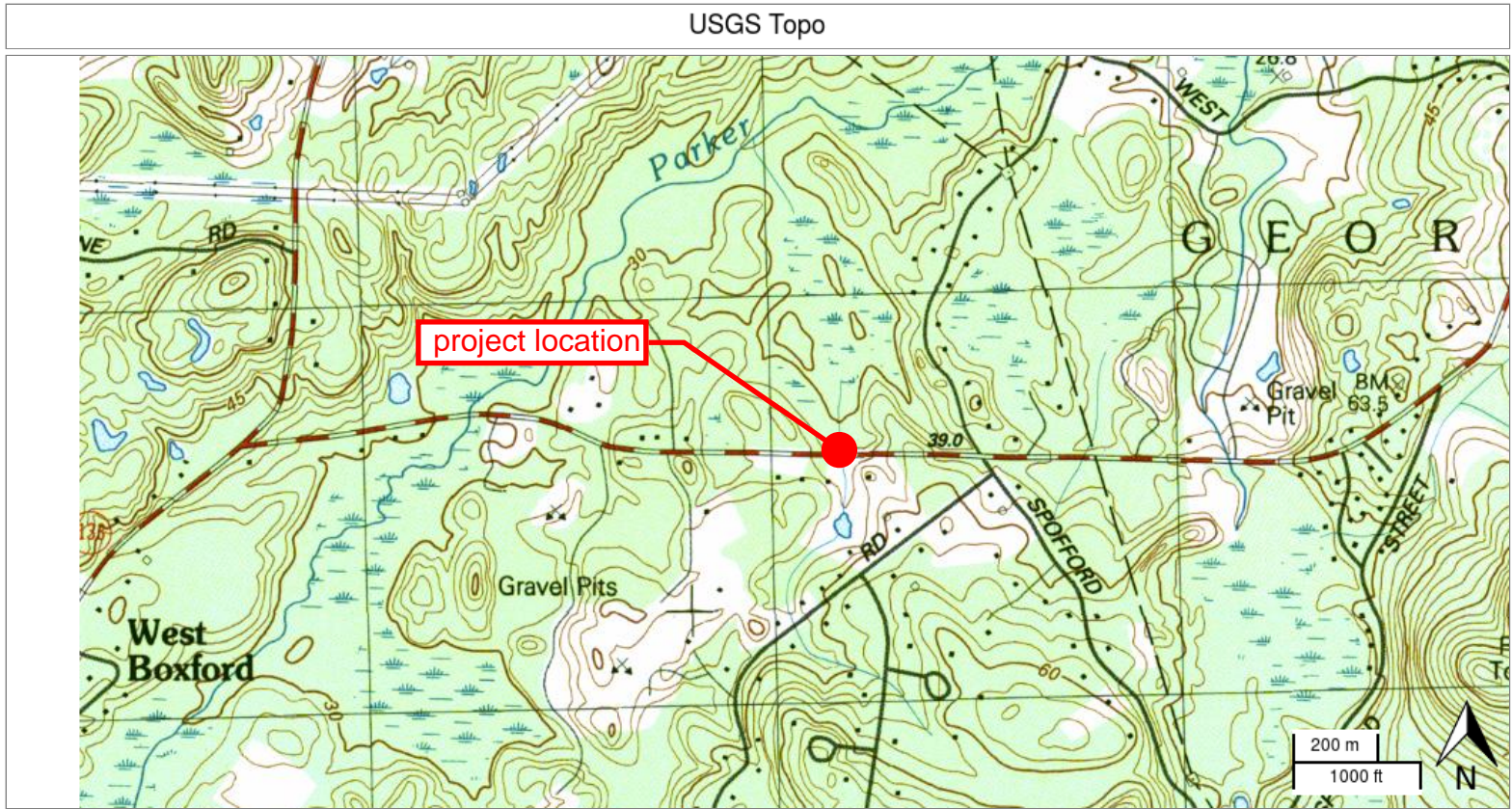
Vegetation and Hydrology Conclusion

- Number of wetland indicator plants > # of non-wetland indicator plants: Yes No
- Wetland hydrology present: Yes No
- Hydric soil present: Yes No
- Other indicators of hydrology present: Yes No
- Sample location is in a BVW: Yes No



3 SUPPORTING MAPS AND DATA

USGS Topo

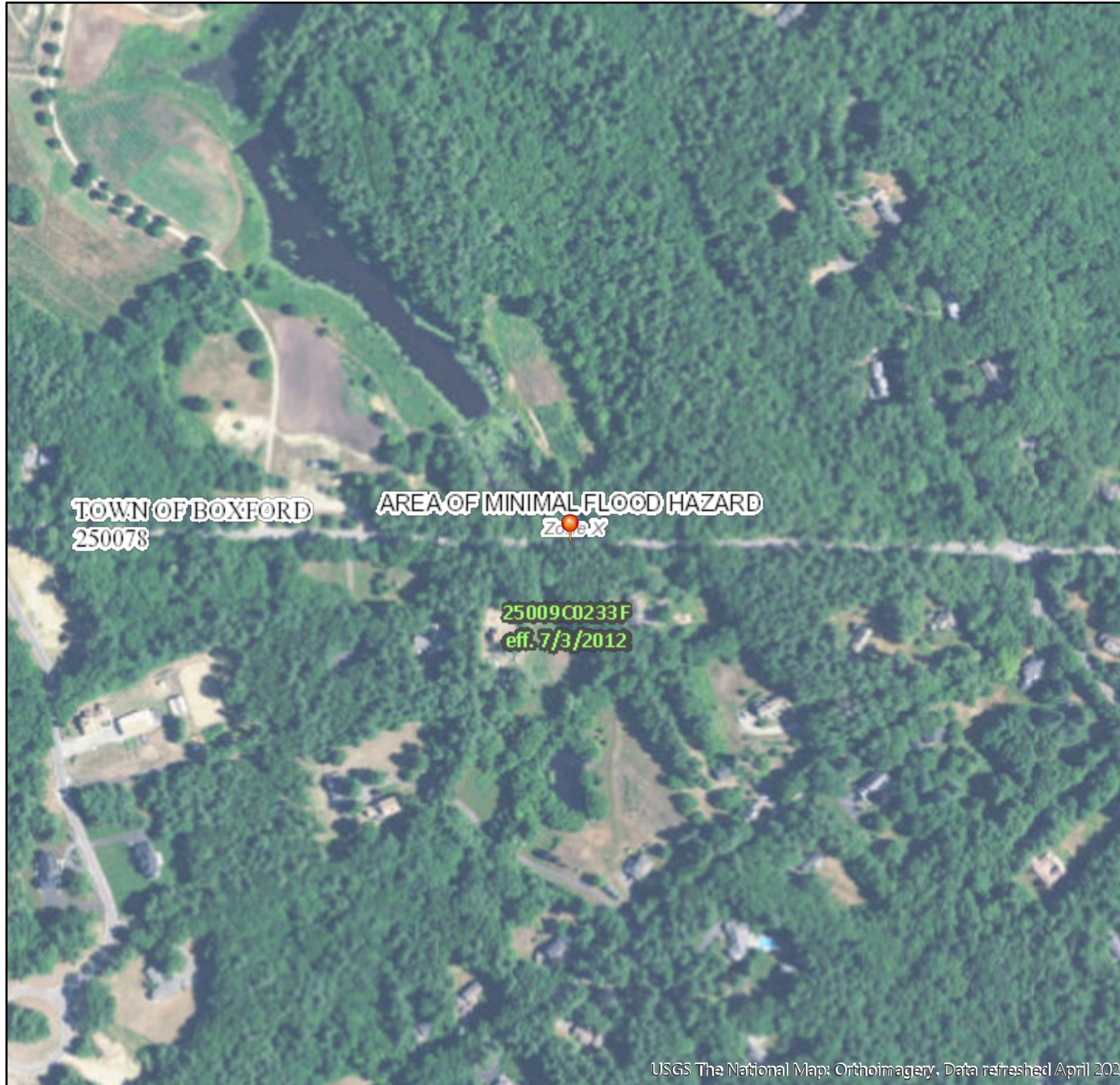


- USGS Topographic Maps
- Tax Parcels for Query
- Detailed Features
- Tax Parcels for Display
- MassGIS Statewide Basemap
- MassGIS Topographic Features Basemap

National Flood Hazard Layer FIRMette



71°2'30"W 42°42'56"N



Legend

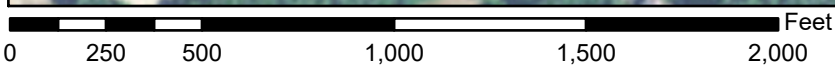
SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone D</i>
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
MAP PANELS		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



USGS The National Map: Orthoimagery. Data refreshed April 2020



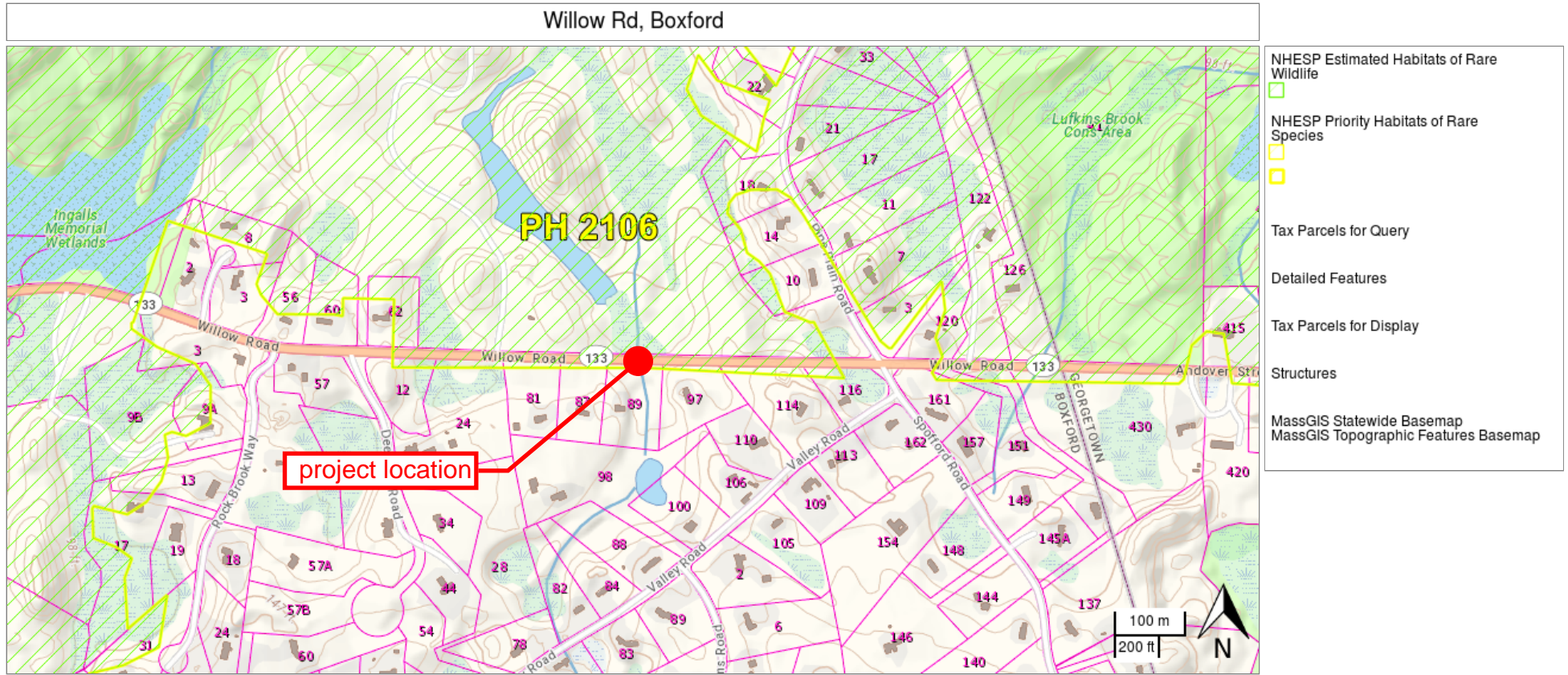
1:6,000

71°1'52"W 42°42'29"N

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **7/28/2020 at 4:38 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

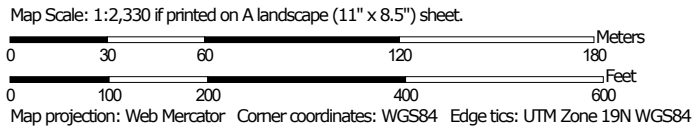
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



Soil Map—Essex County, Massachusetts, Northern Part
(Willow Road, Boxford, MA)




Soil Map may not be valid at this scale.



Soil Map—Essex County, Massachusetts, Northern Part
(Willow Road, Boxford, MA)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils






 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features





-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, Massachusetts, Northern Part
Survey Area Data: Version 16, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 28, 2019—Sep 20, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
52A	Freetown muck, 0 to 1 percent slopes	3.1	11.2%
253A	Hinckley loamy sand, 0 to 3 percent slopes	3.8	13.8%
253B	Hinckley loamy sand, 3 to 8 percent slopes	2.1	7.6%
253C	Hinckley loamy sand, 8 to 15 percent slopes	9.3	34.3%
257E	Hinckley and Windsor soils, 25 to 35 percent slopes	3.2	11.7%
260B	Sudbury fine sandy loam, 3 to 8 percent slopes	2.1	7.9%
406C	Charlton fine sandy loam, 8 to 15 percent slopes, very stony	0.0	0.1%
406D	Charlton fine sandy loam, 15 to 25 percent slopes, very stony	3.6	13.3%
Totals for Area of Interest		27.2	100.0%

4 PHOTO LOG

Site Photos



Figure 1: Culvert outlet on the north side of Willow Rd, photo taken facing east



Figure 2: Culvert pipe end and stone reinforcement at downstream



Figure 3: Part of the stream on the north side of Willow Rd, looking downstream



Figure 4: Upstream culvert end, located on the south side of Willow Rd.



Figure 5: Portion of the stream on the south side of Willow Rd.



Figure 6: Bordering vegetated wetland adjacent to the project location, photo taken facing north

5 LOCAL FORMS AND CHECKLISTS

Boxford Conservation Commission
Application Checklist-Notice of Intent (NOI)

This checklist is designed to assist the applicant in preparing a complete Notice of Intent application. One completed copy of the checklist should be submitted with the application. One (1) original and (7) copies of the NOI forms, plans and appurtenant data listed below are required to be submitted for a complete application

The following are required as part of a complete NOI application and are attached:

- Attached** Completed Notice of Intent form (available from the Conservation Office or at <http://www.mass.gov/dep/appkits/wpaform3.pdf>). (Note: A copy of a complete NOI must also be mailed to the MassDEP NERO, 205B Lowell Street, Wilmington, MA 01887.)

- Attached** Site Plan. See next page for required elements of plan.

- Attached** List of abutters within 250’ of the project parcel(s) (and all pond abutters if applicable), prepared and certified by the Town Assessor’s Office. (Note: A notice of public hearing will be prepared by the Conservation office and provided to the applicant when the application is submitted. At the public hearing, the applicant must provide evidence that the notice was mailed to each of the persons on the certified abutters list.)

- Attached** A copy of a check made out in the correct amount to the Department of Environmental Protection and a copy of a completed State Wetlands Fee Transmittal Form. (Note: the applicant is responsible for mailing this check along with a completed State Wetlands Fee Transmittal Form to the DEP “Lockbox” at Box 4062, Boston MA 02211.)

- Attached** A check for local filing fees made out in the correct amount to the “Town of Boxford”.

- Attached** **N/A** Proof of mailing or proof of hand delivery to the Natural Heritage and Endangered Species Program, if applicable.

- Attached** **N/A** Evidence that all other Boxford Bylaw permit applications relevant to the project have been filed, if applicable (e.g., Board of Health, Zoning Board of Appeals). Please list all other Bylaw permit filings:
_____.

The following must be shown on the site plan attached to the application:

- Shown** All appropriate plan requirements listed in Section 375-5(A)(1)(b) of the Town of Boxford Wetland Protection Bylaw Regulations.
- Shown** The signature and stamp of a Registered Professional Land Surveyor, Registered Sanitarian, or Registered Professional Engineer, and the identity of the firm/person that delineated the wetland resource area..
- Shown** Boundaries of all wetland resource areas (e.g., bordering vegetated wetland, bordering land subject to flooding). All demarcation flags must be located by survey in the field and shown on the plan.
- Shown** All wetland resource area setback lines (e.g., 100' Limit of Jurisdiction, 200' Riverfront, 25' No Disturb, 75' No Build).
- Shown** Existing contour information and proposed grading.
- Shown** Existing site conditions and proposed changes including structures, pavement, landscaping, underground utilities and building overhangs. (Note: it may be necessary to show areas outside of the limits of jurisdictional wetland area in order to provide adequate information for the Commission to properly review the project.)
- Shown** All erosion / sedimentation control measures.
- Shown** Pre- and post-development overstory tree line within jurisdictional area, and a calculation of the percent removal of overstory trees within the “discretionary cutting area” (see Section 375-4(A) and Section 375-98(D) (2) of the Boxford Wetlands Protection Regulations).

Applications subject to the DEP Stormwater Management Policy must include the following: *(The plan and supporting documentation must also be mailed to the DEP Northeast Office and the Boxford DPW)*

- Attached** Completed DEP Stormwater Management Form.
- Attached** Stormwater & flood calculations using the Cornell Atlas rainfall estimates, prepared by a Professional Engineer.
- Attached** Operations and Maintenance Plan.
- Attached** A stormwater management plan showing stormwater management features highlighted in separate colors, per section 375-5(A)(1)(d) of the Boxford Wetlands Protection Bylaw Regulations.

6 ABUTTERS INFORMATION

ROUTE 133, BOXFORD ABUTTERS LIST
CONSERVATION 250'

Map/Lot	Location	Owner	Owner2	Owner Address	Owner City/Town	Owner State	Zip Code
06-02-02.2	WASHINGTON & WILLOW	PRICE FAMILY LLC		54 WALTHAM AVE	SPRINGFIELD	MA	01109
11-01-07	87 WILLOW RD	ROSE MICHELLE		87 WILLOW RD	BOXFORD	MA	01921
11-01-08	89 WILLOW RD	REERA JOHN S	DOTSON CYNTHIA	89 WILLOW RD	BOXFORD	MA	01921
11-01-09	97 WILLOW RD	AGREN MICHAEL	KOKORDA GREGORY	97 WILLOW RD	BOXFORD	MA	01921

CERTIFIED COPY



7/28/20

7 STORMWATER REPORT

TO: Ross Povenmire, Agent
Boxford Conservation Commission
7A Spofford Road
Boxford, MA 01921

DATE: August 6, 2020

FROM: Peter F. Ellison, P.E.

PROJECT NO.: T0998

RE: Notice of Intent – Stormwater Report
Willow Road Culvert Replacement – Boxford, MA

This report serves to accompany the Stormwater Checklist and describes the scope of the project, including existing conditions and proposed work as it pertains to stormwater management.

Project Description

The Town of Boxford Department of Public Works proposes a culvert replacement to an existing culvert under Willow Road. The culvert is owned and maintained by the Town of Boxford. Refer to the attached project location map included in the Notice of Intent. An existing intermittent stream flows through the culvert and is a natural resource area subject to protection by the the Massachusetts Department of Environmental Protection Wetlands Protection Act and Town of Boxford Conservation Rules and Regulations.

Scope of Work

The work under this Contract consists of replacing the deteriorated existing 24" diameter corrugated metal pipe (CMP) that passes under Willow Road.

The work includes furnishing all necessary labor, materials, and equipment required for the following:

- Removal and replacement of the pavement, guard rail, and culvert;
- Construction of a new three-sided, open bottom culvert that meets the Massachusetts Stream Crossing Standards
- Safety improvements; new guard rail.

The Contract includes other related items necessary to complete the work, please refer to the attached Construction Plans for more detail.

All work done under this contract shall be in conformance with the *Massachusetts Highway Department Standard Specifications for Highways and Bridges*, dated 1988, the *English Supplemental Specifications* dated July 1, 2015, the *1977 Construction Standards and the Supplemental Drawings* dated October 2017 and its latest revisions, the latest edition of the *Manual on Uniform Traffic Control Devices (MUTCD)* with revisions; the 1990 *Standard Drawings*

for Signs and Supports; the latest edition of *American Standard for Nursery Stock (ANSI Z-60. 1-1986)*; and the Construction Plans.

Existing Conditions

The project site is a public roadway (Willow Road) at an existing 24" metal culvert which has deteriorated and needs replacement. There are several resource areas at the site subject to protection under the Wetlands Protection Act including inland bank, and bordering vegetative wetlands (BVW).

The roadway surface over the culvert is an entirely impervious surface. Stormwater runoff is being directed into roadside swales ("country drainage"). The roadside swales flow overland and into nearby forested areas for treatment prior to discharging into the resource areas. There is no closed drainage system within proximity of the project. No curbing exists, and the roadway is designed to sheet flow stormwater off the roadway into swales.

The project area is outside of the 100-year flood zone mapped by FEMA. The northern edge of the road serves as a boundary to a Priority Habitat of Rare Species as mapped by the Massachusetts Fish & Wildlife. A MESA Checklist is being filed concurrently with the notice of intent for the project.

Proposed Conditions

The proposed work includes the removal of the failing 24" CMP and construction of a new, three-sided precast concrete culvert with an open bottom. The culvert is proposed to meet the Massachusetts Stream Crossing standards, providing a tremendous benefit to the surrounding wetland resource areas and wildlife. The existing roadway is to be repaved within the project limits. The project will improve traffic safety by integrating new guard rails that meet modern safety standards. Refer to the attached plans of the proposed work to be completed as part of the project. Overall, the limits work have been designed to limit impacts to wetland resource areas and provide a benefit to the nearby environment.

Given the limited scope of this project, installing new stormwater Best Management Practices (BMP's) is not feasible. The project will provide an environmental benefit (new culvert) and will not increase impervious area. Erosion and sediment control devices will be in place throughout construction, and temporary protective shielding will be in place to prevent debris from falling into the river. Work areas will be cleaned and swept daily.

Stormwater Standards

Standard 1: No New Untreated Discharges

There are no new untreated discharges. The existing drainage patterns will continue as they currently exist today, with stormwater flowing to roadside swales/forested area for treatment.

Standard 2: Peak Rate Attenuation

The impervious area, surface material, and conveyance system are to remain unchanged from pre to post development conditions; therefore, the proposed peak runoff rate will not exceed the existing peak runoff rate.

Using the rational method:

$$Q = ciA \quad C=0.98 \text{ (impervious)} \quad i=3.1 \text{ in/hr} \quad A=2360 \text{ SF}$$

$$\text{Pre-development: } Q = 0.98 * 3.1 \text{ in/hr} * 2360 \text{ SF} = 0.17 \text{ cfs}$$

$$\text{Post-development: } Q = 0.98 * 3.1 \text{ in/hr} * 2360 \text{ SF} = 0.17 \text{ cfs}$$

Standard 3: Recharge

There is no feasible way to provide additional groundwater recharge for the project because it is located within a public right-of-way. The roadway is closely surrounding by existing forested area. It is not practical to cut down trees in order to provide additional recharge. Because this is a redevelopment project with no net increase in impervious, the culvert replacement project meets the standards to the maximum extent practicable.

Standard 4: Water Quality

Existing drainage patterns will be retained and match existing conditions. There is no increase in impervious area. Stormwater flows into roadside swales and over forested land receiving treatment prior to discharge to the resource areas. As a culvert replacement project, this project meets Standard 4 to the maximum extent practicable.

Standard 5: Land Uses with Higher Potential Pollutant Loads

The land use is not considered a land use with a higher potential pollutant load.

Standard 6: Critical Areas

Stormwater will not discharge to any critical areas.

Standard 7: Redevelopment Projects

This project is considered a redevelopment project, and as such meets Standards 2, 3, 4, 5, and 6, only to the maximum extent practicable. The project is considered a limited project as it consists of culvert replacement in order to meet the Massachusetts Stream Crossing Standards.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

This project will disturb less than one acre of land, and therefore the project is not covered by a NPDES Construction General Permit.

Sedimentation controls will be in place during construction. Shielding will be in place to trap sediment and debris that may escape the construction area. The shielding will be installed prior to the start of construction.

Erosion and sediment controls are required as shown on the culvert replacement plans, attached to the Notice of Intent project.

Standard 9: Operation and Maintenance Plan

The culvert will be maintained by the Town of Boxford DPW similar to current Town standards for all culverts. There are no new BMPs proposed nor does a closed drainage system exist in proximity to the site.

Standard 10: Illicit Discharges

No illicit discharges are expected or will be permitted.

Conclusion

With the proposed surface conditions to match that of the existing roadway, TEC believes the culvert replacement project will provide a public benefit and a tremendous benefit to the surrounding environment. As a redevelopment and limited project, the stormwater standards have been addressed to the maximum extent practicable. On behalf of the Town of Boxford, TEC respectfully requests that the Commission issue an approval and Order of Conditions for the project.



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

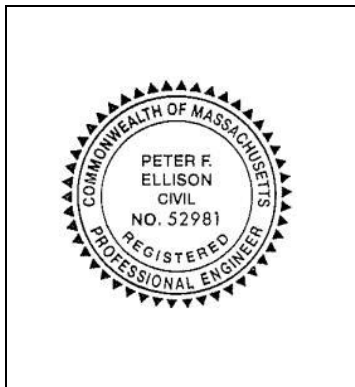
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



8-6-2020

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- New development
- Redevelopment
- Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- No disturbance to any Wetland Resource Areas
- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
 - Credit 1
 - Credit 2
 - Credit 3
- Use of “country drainage” versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe): _____

Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - Static
 - Simple Dynamic
 - Dynamic Field¹
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - Site is comprised solely of C and D soils and/or bedrock at the land surface
 - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - Solid Waste Landfill pursuant to 310 CMR 19.000
 - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - is within the Zone II or Interim Wellhead Protection Area
 - is near or to other critical areas
 - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - involves runoff from land uses with higher potential pollutant loads.
 - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
 - The ½" or 1" Water Quality Volume or
 - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the proprietary BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - Limited Project
 - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - Bike Path and/or Foot Path
 - Redevelopment Project
 - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance tasks;
 - Plan showing the location of all stormwater BMPs maintenance access areas;
 - Description and delineation of public safety features;
 - Estimated operation and maintenance budget; and
 - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.