

# Notice of Intent

## Apple Street Improvements and Bridge Construction Essex, Massachusetts

February 15, 2023  
Project Number 126268

Prepared for:  
Town of Essex  
30 Martin Street  
Essex, MA 01929

Prepared by:  
DuBois & King  
6 Green Tree Drive  
South Burlington, Vermont  
05403





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- A. Figures
- B. DeRosa Wetland Delineation Report
- C. D&K Wetland Review Technical Memorandums dated November 29, 2022 & January 24, 2023
- D. Rare, Threatened, Endangered Species Documentation
- E. Stormwater Compliance Documents
- F. Project Plans
- G. Miscellaneous NOI Documents (Affidavit of Service, Abutter Notification, Public Notice Affidavit, Division of Marine Fisheries - Proof of Mailing)





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Bureau of Resource Protection - Wetlands

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**A. General Information** (continued)

6. General Project Description:

THE PROPOSED PROJECT WILL CONSIST OF RECONSTRUCTION OF APPLE STREET FROM ITS INTERSECTION WITH SOUTHERN AVENUE AND APPROXIMATELY 875 FEET TO THE WEST.

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)

**CULVERT REPLACEMENT**

2. Limited Project Type

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:

|           |                                       |
|-----------|---------------------------------------|
| _____     | _____                                 |
| 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)**

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 checked="" type="checkbox"/> Land Subject to Coastal Storm Flowage | 1140  |  |
|  | 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 BWV \_\_\_\_\_ b. square feet of Salt Marsh

5.  Project Involves Stream Crossings

\_\_\_\_\_ a. number of new stream crossings \_\_\_\_\_ 1 \_\_\_\_\_ 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](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**

02/08/2023

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 \_\_\_\_\_ percentage/acreage
- (b) outside Resource Area \_\_\_\_\_ 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 <https://www.mass.gov/endangered-species-act-mesa-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 <https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review>).  
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, <https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat>; 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:

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -  
Southeast Marine Fisheries Station  
Attn: Environmental Reviewer  
836 South Rodney French Blvd.  
New Bedford, MA 02744  
Email: [dmf.envreview-south@mass.gov](mailto:dmf.envreview-south@mass.gov)

Division of Marine Fisheries -  
North Shore Office  
Attn: Environmental Reviewer  
30 Emerson Avenue  
Gloucester, MA 01930  
Email: [dmf.envreview-north@mass.gov](mailto:dmf.envreview-north@mass.gov)

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.

- c.  Is this an aquaculture project?      d.  Yes     No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).



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**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.

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



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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.

LIST OF PLANS AND OTHER MATERIALS ARE ATTACHED

a. Plan Title \_\_\_\_\_

b. Prepared By \_\_\_\_\_ c. Signed and Stamped by \_\_\_\_\_

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.

*Brendhan Zabricki*

2/15/23

1. Signature of Applicant

2. Date

3. Signature of Property Owner (if different)

*James N. Rutledge*

4. Date

2/15/23

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.

# 1 Introduction

The proposed roadbed elevation and culvert replacement project is located in the southeastern portion of the Town of Essex, Essex County, Massachusetts (see attached Figure 1, USGS Location Map). The Town of Essex is divided north to south by a coastal causeway on Route 133, with approximately half of the community on either side of the causeway. During coastal storm surge events, the causeway typically floods, making Route 133 impassable, requiring all traffic to be detoured. If a particular coastal surge event is large enough, the only other roadway in Essex linking both halves of the community (Apple Street) also floods. While engineering complexities surrounding the Route 133 causeway do not allow that transportation route to be easily elevated out of the coastal surge area, it is possible to elevate a short portion of the Apple Street roadbed, which would provide a critical second transportation connection within the Town when the Route 133 causeway is flooded.

Most of Apple Street, the only other north-south transportation link in Essex, is well above the coastal surge elevation. However, during the coastal storms of early 2018, it was evident that two low areas at the Southern Avenue end of Apple Street are vulnerable to tidal surge flooding, splitting the community in half, from north to south. The only other alternative travel path involves a long detour out to Route 128, with access to the other half of Essex requiring circuitous travel through other towns and increasing travel times substantially. Since the current low spots at the southern end of Apple Street cause a serious transportation cutoff risk, roadbed elevation adjustments in this area would alleviate this vulnerability for several decades. A feasibility study and report titled, *Feasibility Study: Elevation of Apple Street for Alternate Transportation Route, Essex, MA*, dated March 29, 2021, was completed by The Engineering Corp. (TEC). A majority of the information in this project narrative is from the Feasibility Study. The feasibility study evaluated alternatives to raise Apple Street above the 13.7' measured flood elevation to provide significant added resiliency for the future sea level rise and potential for adaptive management. The flood of January 2018 that reached an elevation of 13.7' was an anomaly of a storm. However, given the potential for future sea level rise, storms of this magnitude will likely become a more common occurrence.

## 2 Existing Conditions

### 2.1. General

Apple Street is a two-lane, north-south, paved town roadway connecting Martin Street (Route 22) to the north and Southern Avenue to the south. Within the project area, Apple Street is approximately 18' wide with no pavement markings. The project area road segment runs roughly east-west, even though the road generally runs north-south when its entire length is considered. There are several utility poles with overhead wires that crisscross Apple Street. There is one existing stormwater catch basin located on the southerly side of Apple Street that outlets via an existing 12" pipe to wetlands on the north side. There are no known underground utilities located on Apple Street.

In general, Apple Street topography slopes from the west to east, with the highest elevation of 29' near the western project boundary and the lowest elevation of 17' near the eastern project boundary. There are two low points on Apple Street that are subject to flooding. The first is where an unnamed tributary to the Essex River crosses under Apple Street via a 36" diameter high-density polyethylene (HDPE) culvert approximately 120' north of Southern Avenue. There is a second low point about 400' in length located approximately 200' north of the culvert, which also is subject to flooding. Both of these low points are addressed as part of this project.

Topography surrounding the project area consists of floodplain and low-lying areas associated with the Essex River mostly to the north and east, and an approximate 100 foot (20%) rise south-southwest of the project area. Land abutting the project area consists of a mixture of low-density residential and forest, and wetlands associated with the unnamed tributary to the Essex River.

## 2.2. Methodology and Resource Area Investigations

Resource delineations were completed on February 7, 2020 by DeRosa Environmental, Consulting, Inc. in accordance with methodology described in the Massachusetts Wetlands Protection Act (MGL Ch. 131 Sec. 40) and its regulations at 310 CMR 10.00, et seq., and guidance documents prepared by the MADEP, including The Guide to Inland Vegetated Wetlands in Massachusetts, dated March 1988 and Appendix G of Delineating Bordering Vegetated Wetlands Under the MA Wetlands Protection Act, dated March 1995. DeRosa wetland flags were surveyed by Meridian Associates, Inc. and are incorporated into the existing conditions base map. The DeRosa Wetland Delineation Report, dated November 21, 2020, is included in Appendix B.

On October 27, 2022, DuBois-King, Inc. (D&K) reviewed and verified the 2020 DeRosa delineation. In addition, D&K conducted further field investigations for natural resources and proposed replication areas on January 17, 2023. D&K utilized the aforementioned MA methodology as well as the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0, U.S. Army Corps of Engineers, January 2012) and The Highway Methodology Workbook Supplement, issued by the US Army Corps of Engineers New England District, and dated September 1999. The D&K Apple Street, Essex Road Improvements/Culvert Replacement Wetlands Review Memorandum, dated November 29, 2022, and D&K Essex MA, Apple Street Culvert, Wetlands Replication Soil Test Pits Technical Memorandum, dated January 24, 2023, are included in Appendix C.

### 2.2.1 Jurisdictional Resources

#### Bank

In 310 CMR 10.54(2), a "Bank is the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland."

Bank is associated with the Essex River unnamed tributary. Bank was defined as the first observable break in the slope.

### Bordering Vegetated Wetland (BVW)

As stated in 310 CMR 10.55(2)(a), "Bordering Vegetated Wetlands are freshwater wetlands which border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support as predominance of wetland indicator plants."

Wetlands are located adjacent to Apple Street and border on the unnamed tributary to Essex River and the Essex River. There was an abrupt boundary between upland and wetland soils and vegetation at the site. Wetlands primarily consisted of a forested swamp dominated by red maple (*Acer rubrum*) with a dense shrub underlayer. A wetland finger consisting of a brackish tidal marsh is located outside of the project area, north of the Essex River.

### Buffer Zone

According to 310 CMR 10.04, "Buffer Zone means that area of land extending 100 feet horizontally outward from the boundary of any area specified in 310 CMR 10.02(1)(a)", which includes bank and freshwater wetland for purposes of the proposed project.

### Land Under Waterbodies and Waterways (LUW)

According to 310 CMR 10.56(2)(a), "Land under Water Bodies and Waterways is the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rocks or bedrock."

LUW is associated with the unnamed tributary to Essex River and is defined as the annual mean high water (AMHW). The annual mean low water of the unnamed tributary is not applicable since the tributary is intermittent and is often dry throughout the year.

### Land Subject to Coastal Storm Flowage (LSCSF)

According to 310 CMR 10.04, "Land Subject to Coastal Storm Flowage means land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, whichever is greater."

The LSCSF within the project area is defined as the 100-year floodplain per the FEMA Flood Insurance Rate Map (#25009C0432G), dated July 16, 2014, with an elevation of 10' (NAVD 88).

### Riverfront Area

According to 310 CMR 10.58(2)(a), "Riverfront Area is the area of land between a river's mean annual high water line and a parallel line measured horizontally."

A 200-foot Riverfront Area extends from the mean annual high water line of the Essex River and the unnamed tributary.



### 2.3. Rare, Threatened, and Endangered Species and Priority Natural Communities

The Massachusetts Natural Heritage and Endangered Species Program (NHESP) Atlas, 15th edition, effective August 1, 2021, and MassGIS online mapping data were reviewed during the preparation of this NOI. According to these sources, the proposed work is not within the limits of mapped Priority Habitats of Rare Species or Estimated Habitats of Rare Wildlife. In addition, consultation with the NHESP was conducted and they confirmed the project does not occur within Estimated Habitat of Rare Wildlife or Priority Habitat (see email in Attachment D. The MassGIS map illustrating NHESP data is included as Figure 2 in Attachment A.

The United States Fish & Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) indicated the federally threatened Northern long-eared bat (NLEB) (*Myotis septentrionalis*) and candidate species Monarch Butterfly (*Danaus plexippus*) may occur within the proposed project area. Candidate species for listing receive no regulatory protection. Based on this review, no critical habitats are known on the site.

The USFWS published a final rule to reclassify the NLEB as endangered. The final rule will go into effect on March 31, 2023. However, it should be noted that mature shagbark hickory (*Carya ovata*) trees were observed in the project area; this species is sometimes utilized by northern long-eared bats for roosting. However, the MassGIS data indicated the nearest winter hibernacula for the Northern long-eared bat is approximately 16 miles from the project site (see attached map, Figure 3, Attachment A). It is recommended that tree removal not occur from June 1 through July 31 to avoid potential impacts to roosting bats. The USFWS IPaC Official Species List is included in Attachment D.

The Massachusetts Natural Heritage and Endangered Species Program (NHESP) maps an area of Priority Natural Vegetation Community just north of Apple Street in the project area (Figure 2). This area is defined by the NHESP as a Deciduous Wooded Swamp along the Essex River. Field review confirmed this classification. However, the ecological integrity of this swamp in areas directly adjacent to Apple Street is diminished by the presence of numerous non-native invasive species. Current species composition of this swamp is likely to change as sea level rises and this wetland transitions from freshwater to brackish.

The NHESP also maps two Priority Coastal Natural Communities in the vicinity of the project (Figure 2): Coastal Forest and Salt Marsh. However, as described above, this field review during the growing season led to the determination that no Salt Marsh is present in the immediate project area. The area previously delineated as Salt Marsh is an example of a Brackish Tidal Marsh.

## 3 Proposed Project

The proposed project will consist of approximately 850' of roadway reconstruction of Apple Street beginning at the intersection of Apple Street and Southern Avenue to the driveway at 129 Apple Street. The road will be widened slightly to 20' to provide two 10' travel lanes to meet the minimum criteria for width of a local road per AASHTO guidelines. The roadway would be reconstructed with full depth pavement, and side slope treatments would consist of 2:1 vegetated side slopes with 1.5:1 side slopes stabilized with rockfill, and an 80' vegetated retaining wall adjacent to wetlands to reduce impacts. The

existing 36" HDPE culvert carrying the unnamed tributary of the Essex River under Apple Street will be replaced with a 10'W x 5'H precast concrete 3-sided culvert.

The project will require the removal of 38 trees greater than 4" diameter breast height. Approximately 13% (100') of the total amount of stone walls within the project area will be removed. A majority of the stone wall removal is associated with the 36" HDPE culvert replacement. The remainder of stone walls within the project area will be left untouched or removed and reset.

Several utility poles with overhead wires located along both sides of Apple Street will be relocated. In addition, guardrails will be installed on the north side of Apple Street for the length of the project and along the south side of Apple Street near the proposed 10'H x 5'V culvert.

Two vegetated stormwater drainage swales will be constructed on the upland (south) side of Apple Street. One swale will direct stormwater toward a catch basin and 12" reinforced concrete pipe (RCP) that will discharge to wetlands on the north side of Apple Street. A second swale will direct stormwater to the southwestern portion of the unnamed tributary to Essex River culvert.

The proposed project is shown on the attached plans (see Attachment F).

## 4 Alternatives Analysis

### 4.1 No Build

The "do-nothing" alternative does not result in impacts to environmental resources but was not selected as a preferred alternative because it does not address the purpose and need of the project.

### 4.2 Alternative 1 – Raise Apple Street to Elevation 14.0'

Alternative 1 would raise Apple Street to a minimum elevation of 14', which is above the measured flood elevation of 13.7'. Alternative 1 would alleviate the roadway from being overtopped during the 10-year and 25-year flood events. The alternative results in raising the existing low point on Apple Street a total of 3.2'. Apple Street would also be widened slightly to 20' to provide two 10' travel lanes to meet the minimum criteria for width of a local road per the American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets, 7th edition – Table 5-5. The roadway would be reconstructed with full depth pavement, and side slope treatments would consist of 2:1 vegetated side slopes with 1.5:1 side slopes stabilized with rockfill adjacent to wetlands to reduce impacts. A swale would be created on the upland side of Apple Street and drainage would be directed toward the drop inlet and to the unnamed tributary to Essex River culvert.

### 4.3 Alternative 2– Raise Apple Street to Elevation 14.0' With Wall

Alternative 2 would be similar to Alternative 1 with the exception that the side slope treatments would consist of a 2:1 vegetated side slopes with approximately 270' of retaining wall adjacent to wetlands to minimize impacts.

#### 4.4 Alternative 3 – Raise Apple Street to Elevation 15.3'

Alternative 3 would raise Apple Street to a minimum elevation 15.3'. This accounts for the worst case scenario of Sea Level Rise (+6 ft) available on the Massachusetts Office of Coastal Zone Management evaluation tool used for the project Feasibility Study. The elevation increase also provides 1.6' of freeboard above the measured flood elevation of 13.7'. The alternative results in raising the existing low point on Apple Street a total of 4.4'. Apple Street would be widened slightly to 20' to provide two 10' travel lanes to meet the minimum criteria for width of a local road per AASHTO guidelines. The roadway would be reconstructed with full depth pavement, and side slope treatments would consist of 2:1 vegetated side slopes with 1.5:1 side slopes stabilized with rockfill adjacent to wetlands to reduce impacts. A swale would be created on the upland side of Apple Street and drainage would be directed toward the drop inlet and to the unnamed tributary to Essex River culvert.

#### 4.5 Alternative 4 – Raise Apple Street to Elevation 15.3' With Wall

Alternative 4 would be similar to Alternative 3 with the exception that the side slope treatments would consist of 2:1 vegetated side slopes with approximately 275' of retaining wall adjacent to wetlands to minimize impacts.

#### 4.6 Other Alternatives Considered

Other alternatives were considered but dismissed during the Feasibility Study including the following:

- Work with MassDOT to elevate the causeway and causeway bridge - Town previously asked MassDOT, however, MassDOT elected to do nothing at the causeway.
- Station DPW and Emergency Responders on either end of Apple Street - This was determined to be impractical. Town equipment is limited and this approach was not supported by several Town departments.
- Relying on mutual aid from neighboring towns was evaluated but not preferred - Neighboring towns will be dealing with the same storm in their community and resources will be limited.
- Elevated structure – This was determined to be impractical, costly and would significantly detract from Apple Street's scenic corridor designation.

#### 4.7 Preferred Alternative

A combination of Alternatives 3 and 4 were chosen. The preferred alternative will raise Apple Street to a minimum elevation 15.3'. The reconstructed road will have 2H:1V vegetated side slopes and 1.5H:1V modified rockfill slopes with a 6' high x 80' long vegetated retaining wall adjacent to wetlands to minimize impacts. Even when tidal surge is factored in on top of what will be a higher static sea level in the future, this alternative will provide for a passable roadway for decades to come. As another point of reference, the NOAA Sea Level Rise viewer (<https://coast.noaa.gov/slr/>) for Seavey Island, NH (closest location) gives an approximate Sea Level Rise of 4.5 ft for the extreme scenario at 2060 indicating that this proposed roadbed raising will provide a passable roadway for the foreseeable future.

The town is proposing to replace the existing 36" culvert for ecological improvement, while also elevating the road to be less prone to flooding.

The preferred alternative will have approximately 3,350 square feet (sf) of permanent and 650 sf of temporary impacts to the BVWs, which will be mitigated, within the project area. Three separate wetland replication areas, totaling 3,640 sf, are proposed to meet the performance standards of the Massachusetts Department of Environmental Protection (MADEP) Wetland Protection Act requirements.

## 5 Regulatory Compliance

Descriptions of compliance with the regulatory requirements of the MA WPA and other pertinent state and federal regulatory programs are provided in the following sections.

### 5.1 Massachusetts Wetlands Protection Act

The proposed alterations of the following are subject to the MA WPA per 310 CMR 10.02(1) and 10.02(2):

- 100-foot Buffer Zone (of BVW and Bank)
- Bank
- Bordering Vegetated Wetland
- Land Under Waterbodies and Waterways
- Land Subject to Coastal Storm Flowage
- Riverfront Area

#### Buffer Zone

The project results in alterations within the 100-foot Buffer Zone to BVW and Bank. A majority of the project falls within the buffer zone for the bank and BVWs. Work within the buffer zone includes construction of the elevated roadway, drainage swales, 6' high x 80' long retaining wall, utility pole relocations, replacement of existing catch basin and pipe, and installation of 10'W x 5'H precast concrete culvert. Erosion controls will be installed along the limit of work to prevent erosion and sedimentation of wetland resource areas.

#### Bank

Approximately 24 linear feet (lf) of the bank associated with the unnamed tributary to Essex River will be impacted from installation of the proposed 10'W x 5'H precast concrete culvert. The project will be conducted in accordance with the requirements of 310 CMR 10.54(4)(a). Impacts to the bank are limited to installation of the culvert and riprap slope protection.

The banks located upstream and downstream of the proposed 10'W x 5'H culvert will consist of riprap slopes and modified rockfill slopes. Proposed slopes will protect against bank erosion and provide wildlife habitat functions. The proposed culvert has been designed to meet General Performance Standards per 310 CMR 10.54(4) and the Massachusetts Stream Crossing Standards.

### Bordering Vegetated Wetland (BVW)

A total of approximately 4,000 sf of wetlands will be impacted by the proposed project, including 3,350 sf of permanent impacts and 650 sf of temporary impacts. Installation of erosion controls, such as compost filter tube and silt fence, will temporarily impact approximately 650 sf of wetlands on the north and south sides of Apple Street. Temporarily disturbed wetland areas will be restored to existing conditions with a wetland seed mix.

Approximately 1,900 sf of wetlands on the north side of Apple Street will be impacted as a result of the installation of a modified rockfill slope, 12" RCP outlet riprap splash pad, and 6' high x 80' long vegetated retaining wall. Approximately 1,450 sf of wetlands on the south side of Apple Street will be impacted as a result of construction of the drainage swale, modified rockfill slopes, and the 10'W x 5'H culvert.

Impacts to BVW have been avoided and minimized with the use of a retaining wall on the north side of Apple Street and 1.5V:1H modified rockfill slopes. Erosion controls, such as compost filter tube and silt fence, will be installed along the limit of work to prevent erosion and sedimentation of wetland resource areas. The proposed project has been designed to meet General Performance Standards per 310 CMR 10.55(4).

A total of approximately 3,640 sf of wetland replication will be constructed to compensate for approximately 3,350 sf of permanent wetland impacts. Further details regarding the wetland replication are provided in Section 6 and on the attached project plans.

### Land Under Waterbodies and Waterways

Approximately 230 sf of land under the unnamed tributary to Essex River will be impacted as a result of installation of the 10'W x 5'H culvert. The proposed culvert has been designed to meet General Performance Standards per 310 CMR 10.56(4) and the Massachusetts Stream Crossing Standards. Construction of the proposed culvert will include an opening greater than 1.2 times the bankfull width of the stream, an open-bottom span, a natural bottom substrate matching the upstream and downstream substrates utilizing existing stream material, stream rounding to create thalweg, and crossing span that will maintain dry passage for wildlife. The proposed culvert will be designed to handle the 10-year flood flows.

### Land Subject to Coastal Storm Flowage (LSCSF)

LSCSF will be impacted as a result of the installation of modified rockfill slope for the roadway and the Apple Street side slopes, 10'W x 5'H culvert side slopes, BVW replication areas, and replacement of the existing 36" culvert.

The project was designed to alleviate flooding impacts to Apple Street. The roadway will be elevated using fill to be well out of the storm surge flood zone. A pseudo "No-Rise" analysis was conducted and determined the project will not result in a significant increase in flooding or storm damage affecting the built environment, including buildings, roads, or other man-made structures or infrastructure.

Additionally, the replacement of the inadequate 36" culvert will improve hydraulic and hydrologic functions and wildlife connectivity. The proposed 10'W x 5'H culvert will restore the ecological transition

from freshwater wetland stream to a steep terrain stream and provide safe passage under the road for terrestrial animals.

#### Riverfront Area

A majority of the project area is within the 200' Riverfront Area. However, the project is exempt for Riverfront since it will require a Chapter 91 license per MA WPA 310 CMR10.58(6)(i):

Notwithstanding the Provisions of 310 CMR 10.58(1) through (5), Certain Activities or Areas Are Grandfathered or Exempted from Requirements for the Riverfront Area: Structures and activities subject to a M.G.L. c. 91 waterways license or permit, or authorized prior to 1973 by a special act, are exempt, provided the structure or activity is subject to jurisdiction and obtains a license, permit, or authorization under 310 CMR 9.00: Waterways.

Please refer to the attached plans (see Attachment F) for further information of proposed work in each resource area.

### 5.2 Limited Project Status

The proposed 36" culvert replacement qualifies for consideration as a Limited Project per 310 CMR 10.53(3)(i):

(i) The maintenance, repair and improvement (but not substantial enlargement except when necessary to meet the Massachusetts Stream Crossing Standards) of structures, including dams and reservoirs and appurtenant works to such dams and reservoirs, buildings, piers, towers, headwalls, bridges, and culverts which existed on the effective date of 310 CMR 10.51 through 10.60 (April 1, 1983).

### 5.3 Stormwater Management

The existing stormwater system within the project area consists of a catch basin on the south side of Apple Street which discharges in a northerly direction to the wetlands located on the north side of Apple Street via a 12" RCP under Apple Street. An existing natural drainage swale directs stormwater to the catch basin. The catch basin and pipe will be replaced with a 12" RCP, which will capture drainage from the upland side (south side) of Apple Street and direct it to the north side of Apple Street. A drainage swale will be installed on the south side of Apple Street and will direct stormwater in both an easterly and westerly direction to the catch basin. In addition, a proposed drainage swale will direct stormwater in an easterly direction to the unnamed tributary on the south side of Apple Street.

There are no new sources of stormwater discharge to adjacent wetlands proposed. Sedimentation controls will be installed prior to the start of construction. A floating silt fence will be placed in the unnamed tributary to the Essex River to prevent sediment runoff to the stream. Water from within the control of water cofferdam will be pumped to stilling basins before reentering the unnamed tributary to Essex River to remove any sediment created from construction activities. A Stormwater Management

Operation and Maintenance Plan was developed to ensure long-term stormwater quality discharge from the site.

See Attachment E for TEC's Stormwater Standards report, TEC Stormwater Management Operation and Maintenance Plan, and MADEP Checklist for Stormwater Report.

## 6 Mitigation

### 6.1 Wetland Replication

#### 6.1.1 Regulatory Compliance

In accordance with 310 CMR 10.55 (4), replication of impacted BVW areas will meet the following conditions:

1. The replacement area will be roughly equal to the BVW area that will be permanently lost. The proposed project will result in permanent impacts of 3,350 sf and temporary impacts of 650 sf of BVW. The wetland replacement areas will amount to approximately 3,640 sf.
2. The groundwater and surface elevation of the replacement area shall be approximately equal to that of the lost area. The proposed replication areas will be graded as such to replicate hydrologic conditions of the impacted wetlands and the adjacent wetlands.
3. The overall horizontal configuration and location of the replacement area with respect to the bank shall be similar to that of the lost area.
4. The replacement area shall have an unrestricted hydraulic connection to the same water body or waterway associated with the lost area. The proposed replication areas will be constructed adjacent to existing wetlands and grading to provide a hydraulic connection. In addition, the Essex River and unnamed tributary are tidally influenced and will provide intermittent flooding of replication areas during high tides.
5. The replacement area shall be located within the same general area of the water body or reach of the waterway as the lost area. The proposed replication areas are located within the same watershed as the impacted wetlands.
6. At least 75% of the surface of the replacement area shall be reestablished with indigenous wetland plant species within two growing seasons, and prior to said vegetative reestablishment. Any exposed soil in the replacement area shall be temporarily stabilized to prevent erosion in accordance with standard U.S. Soil Conservation Service methods. The proposed planting plan for the replication areas will consist of native plant species found in the impacted wetlands. Reestablishment of replication areas will comply with the above criteria as noted on the replication plans.
7. The replacement area shall be provided in a manner, which is consistent with all other General Performance Standards for each resource area in Part III of 310 CMR 10.00.

The proposed project includes three separate wetland replication areas to compensate for impacts to BVW. Wetland replication areas will be constructed adjacent to the existing BVW on the north side of Apple Street. All wetland replication areas gradually slope toward the existing BVW and can be easily

accessed from the Apple Street project construction area. Construction of wetland replication areas will involve removing approximately 8-12 inches of native soil below the finish grade and replacing with wetland soil. If possible, mature red maple and shagbark hickory trees will be left in place to provide shade and bat habitat. The excavated areas will be feathered into the surrounding landscape. Replication areas will be rough graded to provide natural mound and pool topography. Facultative wetland shrubs, including highbush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), and swamp azalea (*Rhododendron viscosum*), within existing wetland impact areas will be removed and transplanted in the replication areas. Additional wetland tree and shrub species will be planted along with a wetland seed mix. Additional details are included on the attached project plans.

### 6.1.2 Existing Conditions Considerations

D&K conducted site visits on October 27, 2022 and January 17, 2023 to investigate natural resources, including wetlands, and proposed wetland replication areas. Information gathered during the site visits are provided in the attached Technical Memorandums, dated November 29, 2022 and January 24, 2023. Soil test pits were performed in the wetland and wetland replication areas as shown on the attached project plans. Test pit data was taken into account when determining the proposed grades of the replication areas.

Wetland replication Area 1, approximately 990 sf, is located on the northwestern end of the project area. Soil test pit data within Area 1 indicated the soil consisted of a loamy sand texture and was saturated at 10 inches with free water in the pit at 14 inches. Redoximorphic features were also present at 10 inches.

Wetland replication Area 2, approximately 1,150 sf, is located on the eastern end of the project area. Soil test pit data within Area 2 indicated the soil consisted of a loamy sand texture. Refusal was encountered at 16 inches.

Wetland replication Area 3, approximately 1,500 sf, is located on the eastern end of the project area. Soil test pit data within Area 3 indicated the soil consisted of a loamy sand texture and was saturated at 19 inches with free water in the pit just below 19 es. Redoximorphic features were evident at 19 inches.

Functions and values of the impacted wetland areas include erosion control and sediment/shoreline stabilization and water storage for flood water and storm runoff. Wetland replication areas will provide similar functions and values as wetlands loss as a result of their close proximity to the impacted wetlands and unnamed tributary and Essex River.

### 6.1.3 Construction Sequencing

Construction sequencing of the wetland replication areas will generally consist of the following as shown on the attached project plans:

1. A pre-construction conference with the contractor and a qualified wetland specialist shall be conducted to ensure all aspects of the project, as well any order of conditions are understood. Equipment needs and access routes to the proposed replication area shall be firmly established.
2. The boundary of bordering vegetated wetland shall be re-established in the field as needed.



3. Erosion control barriers shall be installed along the existing wetland edge of the replication areas. The erosion control barriers shall also serve as the replication areas. The erosion control barriers shall also serve as a limit of work. Only siltation fence shall be used for erosion control in order to minimize the potential for invasion by weed species.
4. Vegetation shall be cleared within the limits of grading from the replication areas.
5. Soil shall be installed to an elevation approximately 8-12 inches below final grade. Final design grade is approximately equal to the area of the immediately adjacent wetland. The excavated area shall be "feathered" into the surrounding landscape so as not to create abrupt changes in grade and in landscape so as not to create abrupt changes in grade and in no case steeper than 2:1. All excavation equipment operating within the replication area shall be on tracks to reduce soil compaction. Machine movement shall be minimized to the extent practicable.
6. Rough grades shall be verified by field survey to confirm design elevations have been met. Adjustments shall be made as appropriate.
7. Due to the potential presence of invasive species, it is not recommended that topsoil from the impacted wetlands be re-used. Therefore, clean loam shall be imported on site and installed to a depth of at least 12 inches. Loam shall contain at least 15% organic matter content by dry weight or 50% by contain at least 15% organic matter content by dry weight or 50% by volume. Leaf compost shall be used to amend loam to achieve desired organic matter content.
8. The replication areas shall be gently compacted and hand raked to enhance surface water retention. Spot elevations shall be taken again to confirm design elevations.
9. Plantings will be obtained as container grown nursery stock. Substitutions may be required depending on availability and cost, as approved by the engineer.
10. A wetland seed mix, shall be hand sown as an understory cover to provide short-term erosion control, wildlife food, and cover, and to discourage the erosion control, wildlife food, and cover, and to discourage the establishment of invasive, non-native species such as purple loosestrife (*Lythrum salicaria*) and common reed (*Phragmites australis*). Seeded areas shall be mulched with salt hay. The side slopes of the replication area will be sown with new england erosion control restoration mix for dry sites.
11. The replication area shall be monitored in accordance with any order conditions issued for this project by the Essex Conservation Commission.

#### 6.1.4 Replication Monitoring

Construction and post-construction monitoring of wetland replication areas will be implemented. An environmental monitor with a minimum of 5 years of experience in the construction of wetland replication areas and general construction practices will be on-site to monitor the excavation, grading, and planting of the replication areas. A 2-year monitoring program following construction is recommended. The project supervisor or monitor should be present during the replication construction tasks including:

1. Before excavation or erosion control installation work begins to inspect site flagging;
2. During excavation of the altered area if vegetation is to be translocated to the replication area to ensure survival of the plantings;

3. Before soil translocation or addition into the replication area to inspect excavated elevations and likely post-construction groundwater elevations for the replication area;
4. After each stage of grading work is completed to inspect finished elevations;
5. During planting and seeding and after the first month of the growing season to inspect propagation techniques;
6. After one growing season to observe vegetation development and regulatory compliance;
7. After two growing seasons to determine vegetation development and regulatory compliance
8. After subsequent growing seasons, if a greater than 2-year monitoring program is required.

A monitoring report will be submitted to the Essex Conservation Commission in the late spring and at the end of each of the first two growing seasons at a minimum. Monitoring reports will include recommendations for additional plantings should the replication area appear to be unlikely to meet the 75% reestablishment standard. Monitoring for invasive species should also be conducted and any invasive handpicked before becoming widespread and established. Each monitoring report will project potential successional patterns based on observed establishment of vegetation.

The final monitoring report will be accompanied by an as-built plan. The final monitoring report will describe the conditions at the replication site and how the functions of the impacted wetland have been replaced by the development of the replication site.

## 6.2 Best Management Practices

The project will utilize best management practices (BMPs) such as erosion and sedimentation controls and proper construction sequencing to prevent and minimize adverse construction impacts to resource areas. All exposed soils on the site will be stabilized as soon as possible. Erosion and sedimentation controls will not be removed until 70% stabilization has been achieved over 90% of the area. BMPs are shown on the attached project plans.