



Public Service of New Hampshire Seacoast Reliability Project

Salt Marsh Protection and Restoration Plan

Durham to Newington, NH

Presented To:
Public Service Company of New Hampshire
780 North Commercial Street
Manchester, NH 03101

Submitted:
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Submitted By:
Normandeau Associates, Inc.
25 Nashua Road
Bedford, NH 03110

www.normandeau.com

Introduction

Public Service Company of New Hampshire d/b/a Eversource Energy (“PSNH”) is proposing to construct a new 115 kilovolt (“kV”) transmission line between their existing Madbury and Portsmouth substations to enhance the electric reliability in the seacoast region. The Seacoast Reliability Project (“SRP”) is proposed to be located in the Towns of Madbury, Durham and Newington as well as the City of Portsmouth, in Strafford and Rockingham Counties, New Hampshire. The SRP transmission line will be approximately 12.9 miles long, including a 0.9 mile crossing under Little Bay. The cable crossing proposed in Little Bay will affect a corridor approximately 100 feet wide within a charted Cable Area approximately 1,000 feet wide.

PSNH has designed the SRP to avoid environmental impacts where possible. Temporary impacts to fringing salt marsh are unavoidable on both shores of Little Bay. Impacts will result from timber mat placement to allow construction equipment to cross the marsh to reach the work areas, and from burial of the cables underneath the marsh. The latter effort will require salvage of the existing peat where feasible, and replacement of the peat and salt marsh restoration after the cable burial is completed. The following text and plans describe the existing conditions, construction activities, salt marsh protection and restoration methods, and long-term monitoring to document recovery.

Proposed Protection and Restoration Plan

All construction and restoration will be done under the supervision of the Engineer and an Environmental Monitor to ensure minimization of impacts to native vegetation and wildlife, and that all disturbed areas are stabilized. All salt marsh salvage and restoration will be conducted by a contractor experienced in salt marsh restoration, and overseen by the Environmental Monitor.

Areas of the fringing salt marsh that will be temporarily impacted by the underwater cable installation are shown on the attached plan set. At a minimum, the marsh will be restored to the extent and elevations shown on the figures. On the west shore, the Applicant is also proposing to re-establish approximately 461 sq.ft. of salt marsh after the cable installation is complete. This re-establishment area appears to be former salt marsh as defined by the extent of boulders to the north of the work corridor (Sheet 3). Large boulders appear to have been artificially placed on the marsh surface, potentially during either the original cable construction in the early 1900’s or during repairs in the 1940’s or 1970’s. Substrates under the re-establishment area are some additional rocks, unconsolidated silts, sands and gravels.

Prior to construction, the work areas will be delimited with temporary fencing to confine construction equipment and staff to the impact area, and to prevent damage to the adjacent marsh. Erosion controls along the upland edge will be put in place to prevent disturbed soils from migrating into the saltmarsh during the work period. Within the work area,

timber mats will be used to protect the marsh from equipment and foot traffic. Excavation in the marsh will be limited to only the area necessary for burying the cables. Matting and excavation will occur over the briefest time period possible to limit impacts to the salt marsh. In the excavation areas, all suitable salt marsh peat will be salvaged and stockpiled for replacement during restoration. Suitable peat will be determined in the field by the Environmental Monitor and will be thick enough (minimum 6 inches) and intact enough (minimum 4 square feet) to tolerate salvaging, storing and re-planting. In areas where the salt marsh does not have fully established or suitable peat as described above, the marsh will not be salvaged and will be replanted as described below.

The salvaged peat blocks will be protected from sun, wind, dehydration and freezing in a nearby, suitable upland area and maintained for the duration of the cable installation period. The peat blocks will be kept moist with fresh water. The construction work in the salvage area will be completed with sufficient time to replace the salvaged peat blocks no later than November 1. If the cable installation period extends beyond November 1, the peat blocks will be maintained through the winter and replaced in April of the following year. Upon completion of construction, the underlying substrates will be restored to appropriate subgrades to support either the peat blocks or salt marsh planting, so that final elevations are equal to or up to two inches higher than the pre-construction condition. Where the peat was suitable for salvaging, the peat blocks will be replaced and anchored with rebar stakes driven into the substrates and/or adjacent peat. Any open interstices between the peat blocks will be filled with a mixed sand to cover exposed roots and maintain grades. Additional salt marsh cordgrass (*Spartina alterniflora*) will be planted in the interstices if the gap between peat blocks exceeds 4 inches.

In areas where the peat was unable to be salvaged, the substrates will be restored with a mixed sand, contained within sandbags or otherwise protected to stabilize the sediments. The marsh will be replanted at 1 sq.ft. intervals with salt marsh cordgrass seedlings in low marsh areas, and salt marsh hay (*Spartina patens*) seedlings in high marsh areas as designated by the Environmental Monitor. The seaward face of the restored marsh will be protected from ice and wave action with a coir log. This may include placing several in the intertidal zone below the re-establishment area as protection from wave and ice scour.

In the re-establishment area, mixed sand substrates will be placed to elevations consistent with the low salt marsh bordering the re-establishment area. The mixed sands will be contained within sandbags or otherwise protected to stabilize the sediments. The marsh will be replanted with salt marsh cordgrass seedlings as directed by the Environmental Monitor. The seaward face of the re-established marsh will be protected from ice and wave action with coir logs and rocks placed seaward of the marsh area (Sheet 3).

The Environmental Monitor will assure compliance with permit conditions during and after the construction activities, including five (5) years of post-construction monitoring, and preparation of the appropriate compliance reports for submittal to NHDES. The monitoring will include a site inspection in the spring and late summer, growing season vegetation

cover estimates by species, and photographs. Areas with less than 80% cover in late summer will require additional planting or other appropriate enhancements. Any areas with erosion will be repaired immediately. All construction fencing and erosion control materials will be manually removed as soon as they are no longer necessary.

The restored salt marsh areas will be monitored for invasive species. Potential invasive species will be primarily common reed (*Phragmites australis*). Common reed has not been observed in the vicinity of the work areas, so the likelihood of invasion is relatively low. If found, invasive plants will be hand pulled and removed from the salt marsh restoration areas and disposed of in a manner and location to preclude their survival or spread. A monitoring report will be submitted to NHDES by November 1 of each monitoring year.



ATTACHMENT 1:

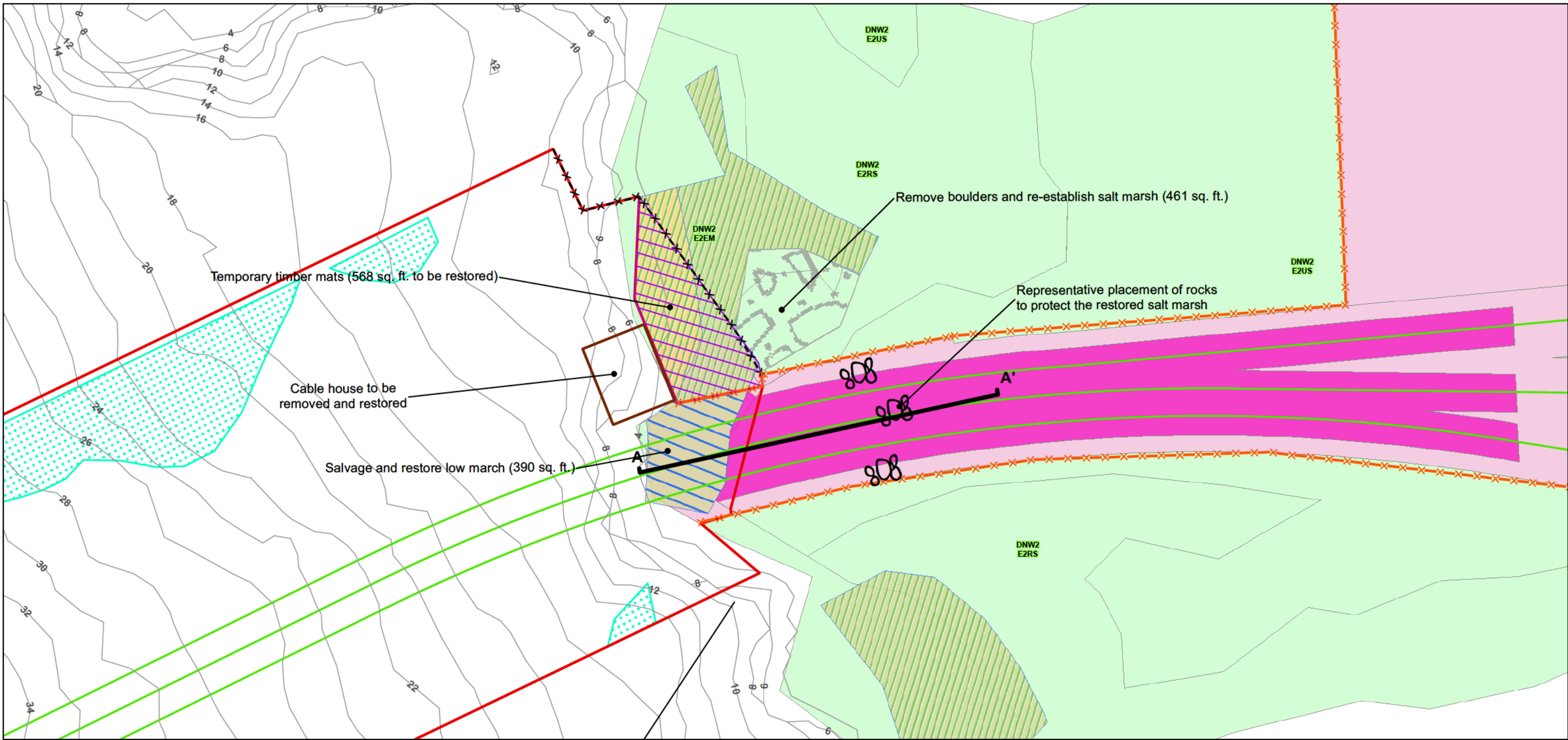
Salt Marsh Restoration Plan

Sheets 1 through 4

CONSTRUCTION NOTES:

- 1) ALL CONSTRUCTION AND RESTORATION WILL BE DONE UNDER THE SUPERVISION OF THE ENGINEER AND AN ENVIRONMENTAL MONITOR
- 2) ALL SALT MARSH SALVAGE AND RESTORATION WILL BE CONDUCTED BY A CONTRACTOR EXPERIENCED IN SALT MARSH RESTORATION, AND OVERSEEN BY THE ENVIRONMENTAL MONITOR.
- 3) PRIOR TO CONSTRUCTION, THE WORK AREAS WILL BE DELIMITED WITH TEMPORARY FENCING TO CONFINE CONSTRUCTION EQUIPMENT AND STAFF TO THE IMPACT AREA, AND TO PREVENT DAMAGE TO THE ADJACENT MARSH.
- 4) EROSION CONTROLS ALONG THE UPLAND EDGE WILL BE PUT IN PLACE TO PREVENT DISTURBED SOILS FROM MIGRATING INTO THE SALT MARSH DURING THE WORK PERIOD.
- 5) WITHIN THE WORK AREA, TIMBER MATS WILL BE USED TO PROTECT THE MARSH FROM EQUIPMENT AND FOOT TRAFFIC.
- 6) EXCAVATION IN THE MARSH WILL BE LIMITED TO ONLY THE AREA NECESSARY FOR BURYING THE CABLES.
- 7) MATTING AND EXCAVATION WILL OCCUR OVER THE BRIEFEST TIME PERIOD POSSIBLE TO LIMIT IMPACTS TO THE SALT MARSH.
- 8) IN THE EXCAVATION AREAS, ALL SUITABLE SALT MARSH PEAT WILL BE SALVAGED AND STOCKPILED FOR REPLACEMENT DURING RESTORATION. SUITABLE PEAT WILL BE DEFINED IN THE FIELD BY THE ENVIRONMENTAL MONITOR, BUT WILL BE THICK ENOUGH (6 INCHES) AND INTACT ENOUGH (2 SQUARE FEET) TO TOLERATE SALVAGING, STORING AND RE-PLANTING.
- 9) THE SALVAGED PEAT BLOCKS WILL BE PROTECTED FROM SUN, WIND, DEHYDRATION AND FREEZING IN A SUITABLE UPLAND AREA AND MAINTAINED FOR THE DURATION OF THE CABLE INSTALLATION PERIOD. THE PEAT BLOCKS WILL BE KEPT MOIST WITH FRESH WATER.
- 10) CONSTRUCTION IN THE SALVAGE AREA WILL BE COMPLETED WITH SUFFICIENT TIME TO REPLACE THE SALVAGED PEAT BLOCKS NO LATER THAN NOVEMBER 1. IF THE CONSTRUCTION PERIOD EXTENDS BEYOND NOVEMBER 1, THE PEAT BLOCKS WILL BE MAINTAINED AS DESCRIBED IN #9 THROUGH THE WINTER AND REPLACED IN APRIL OF THE FOLLOWING YEAR.
- 11) UPON COMPLETION OF CONSTRUCTION, THE UNDERLYING SUBSTRATES WILL BE RESTORED TO APPROPRIATE SUBGRADES TO SUPPORT THE PEAT BLOCKS, SO THAT FINAL ELEVATIONS ARE EQUAL TO OR UP TO TWO INCHES HIGHER THAN THE PRE-CONSTRUCTION CONDITION.
- 12) THE PEAT BLOCKS WILL BE REPLACED AND ANCHORED WITH REBAR STAKES DRIVEN INTO THE SUBSTRATES AND/OR ADJACENT PEAT. ANY OPEN INTERSTICES BETWEEN THE PEAT BLOCKS WILL BE FILLED WITH A MIXED SAND TO COVER EXPOSED ROOTS AND MAINTAIN GRADES. ADDITIONAL SALT MARSH CORDGRASS (SPARTINA ALTERNIFLORA) SEEDLINGS WILL BE PLANTED IN THE INTERSTICES IF THE GAP BETWEEN PEAT BLOCKS EXCEEDS 4 INCHES.
- 13) IN AREAS WHERE THE SALT MARSH DOES NOT HAVE FULLY ESTABLISHED PEAT AS DESCRIBED IN #8, THE MARSH WILL BE REPLANTED AT 1 SQ.FT. INTERVALS WITH SALT MARSH CORDGRASS SEEDLINGS IN LOW MARSH AREAS, AND SALT MARSH HAY (SPARTINA PATENS) SEEDLINGS IN HIGH MARSH AREAS AS DESIGNATED BY THE ENVIRONMENTAL MONITOR.
- 14) IN THE REPLANTING AREAS, THE SUBSTRATES WILL BE RESTORED WITH A MIXED SAND, CONTAINED WITHIN SANDBAGS OR OTHERWISE PROTECTED, TO STABILIZE THE SEDIMENTS. SURFACE ELEVATIONS WILL MATCH PRECONSTRUCTION CONDITIONS OR AS DIRECTED BY THE ENVIRONMENTAL MONITOR. THE SEAWARD FACE OF THE RESTORED MARSH WILL BE PROTECTED FROM ICE AND WAVE ACTION WITH COIR LOGS.
- 15) IN THE SALT MARSH RE-ESTABLISHMENT AREA ON THE WEST SHORE, THE BOULDERS WILL BE REMOVED FROM THE INTERTIDAL ZONE AND PLACED IN AN APPROVED LOCATION UNDER THE DIRECTION OF THE ENVIRONMENTAL MONITOR. THIS MAY INCLUDE PLACING SEVERAL ROCKS IN THE INTERTIDAL ZONE BELOW THE RE-ESTABLISHMENT AREA AS PROTECTION FROM WAVE AND ICE SCOUR.
- 16) MIXED SAND SUBSTRATES WILL BE RE-ESTABLISHED TO ELEVATIONS CONSISTENT WITH THE BORDERING LOW SALT MARSHES NORTH AND SOUTH OF THE RE-ESTABLISHMENT AREA. THE MIXED SANDS WILL BE CONTAINED WITHIN SANDBAGS OR OTHERWISE PROTECTED TO STABILIZE THE SEDIMENTS.
- 17) THE MARSH WILL BE REPLANTED WITH SALT MARSH CORDGRASS SEEDLINGS AT 1SQ.FT INTERVALS.
- 18) THE SEAWARD FACE OF THE RE-ESTABLISHED MARSH WILL BE PROTECTED FROM ICE AND WAVE ACTION WITH COIR LOGS AND ROCKS PLACED SEAWARD OF THE MARSH AREA (SEE NOTE 15).
- 19) ALL CONSTRUCTION FENCING AND EROSION CONTROL MATERIALS WILL BE MANUALLY REMOVED AS SOON AS THEY ARE NO LONGER NECESSARY.
- 20) THE ENVIRONMENTAL MONITOR WILL ASSURE COMPLIANCE WITH PERMIT CONDITIONS DURING AND AFTER THE CONSTRUCTION ACTIVITIES, INCLUDING FIVE (5) YEARS OF POST-CONSTRUCTION MONITORING, AND PREPARATION OF THE APPROPRIATE COMPLIANCE REPORTS FOR SUBMITTAL TO NHDES.

Drawn By: wmcclroy Date : 6/19/2017 Project No: 22860.003			Seacoast Reliability Project Salt Marsh Restoration Notes
			Sheet 1 of 4

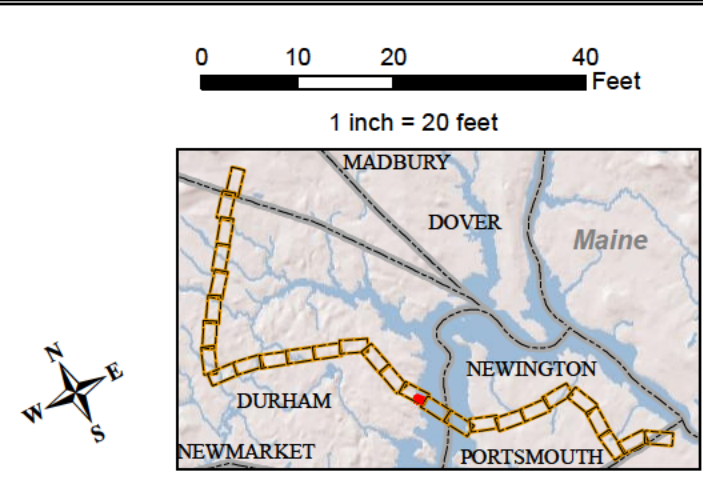


Drawn By: wmcody
Date: 6/20/2017
Project No: 22860_003

- Silt Curtain
- Silt Fence, Hay Bale, Erosion Control Mix Berm
- Straw Wattle
- 2ft Contour
- Underground Cable
- Tree Clearing
- Timber Mats (to be restored)
- Workpad/Access
- Wetland
- Concrete Mattresses
- Temporary Impact
- High Marsh Zone
- Low Salt marsh
- Salvage and restore low marsh
- Boulders
- Rocks

Parcel boundary and owner data were acquired from municipal databases as of May 2016.

Service Layer Credits: Copyright © 2014 Esri, granit.edu aerial photos 2015.



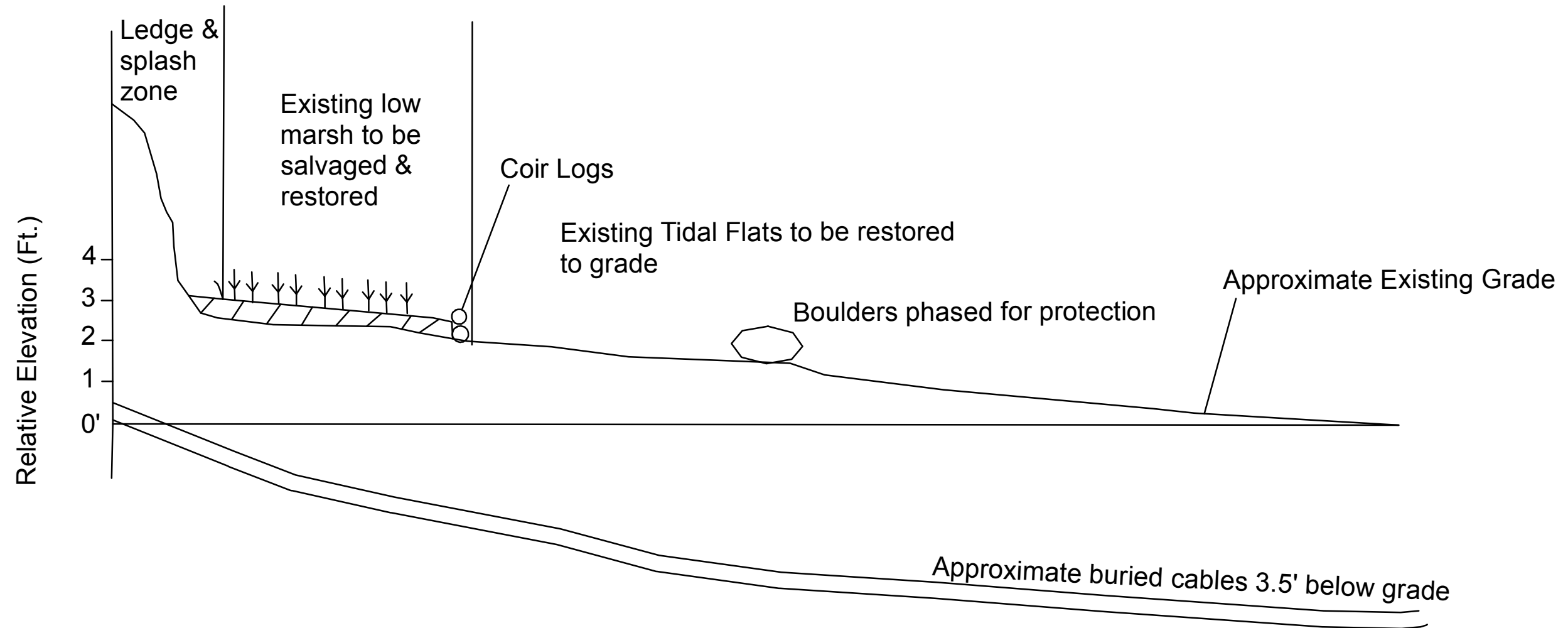
EVERSOURCE
ENERGY

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

Seacoast Reliability Project
Salt Marsh Restoration Plan
Sheet 2 of 4

Preliminary Marsh Restoration Area, West Shore

Section A-A'

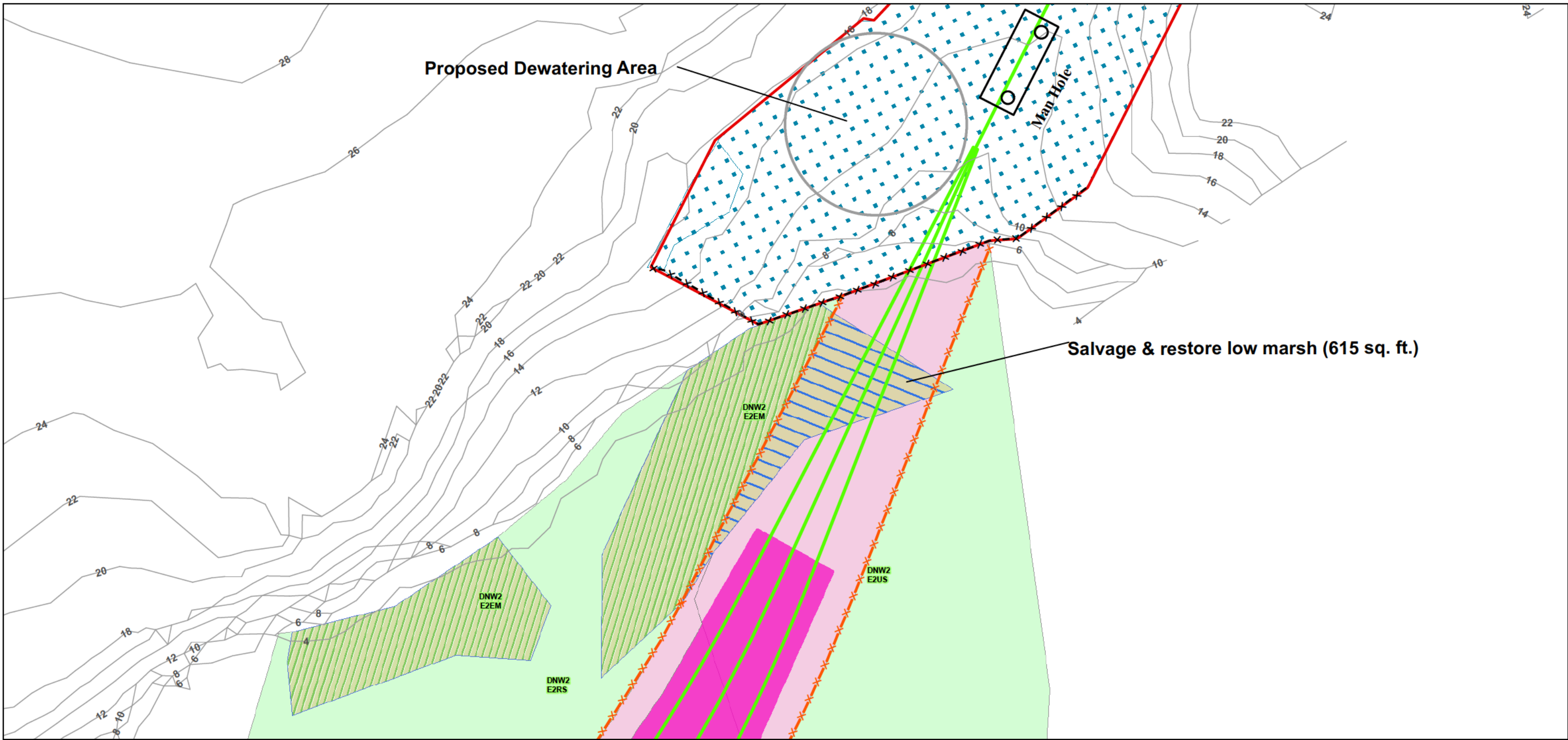


Drawn By: wmcloey
Date : 6/20/2017
Project No: 22860.003



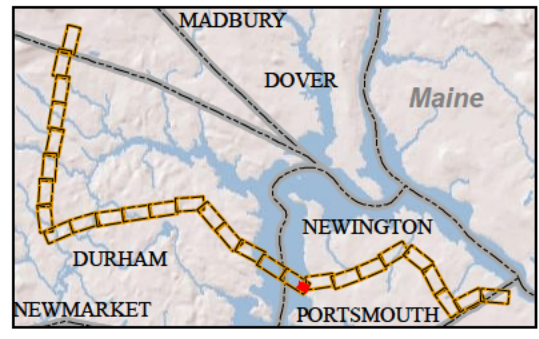
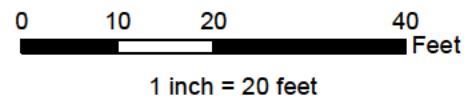
Seacoast Reliability Project
Salt Marsh Restoration Representative Cross-Section
Sheet 3 of 4





Drawn By: dpelleiter
 Date: 6/22/2017
 Project No: 22860_003

- Silt Curtain
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- Straw Wattle
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- Concrete Mattresses
- Temporary Wetland Impact
- Low Salt marsh
- Salvage and restore low marsh



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**Seacoast Reliability
Project
Salt Marsh (East)
Restoration Plan**

STATE OF NEW HAMPSHIRE
SARAH D. ALLEN
3/8/17
No. 083
CERTIFIED WETLAND SCIENTIST