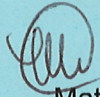


**STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION**

FROM:  Matt Urban
Chief, Operations Management Section

DATE: January 9, 2019

AT (OFFICE): Department of
Transportation

SUBJECT Dredge & Fill Application
Salem, 13933A Bureau of
Environment

TO Gino Infascelli, Public Works Permitting Officer
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith is the application package prepared by VHB for NH for the subject minimum impact project. This project is classified as minimum per Env-Wt 303.04(j). The project is located on Interstate 93 in the Town of Salem, NH. The proposed work consists of the I-93, 4th lane expansion from the Stateline to Exit 1 and proposed to dredge and fill approximately 350 SF within wetlands from the proposed widening.

This project was reviewed at the Natural Resource Agency Coordination Meeting on July 18, 2018 and November 21, 2018. A copy of the minutes has been included with this application package. A copy of this application and plans can be accessed on the Departments website via the following link: <http://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/wetland-applications.htm>

Mitigation is not proposed for this project since the impacts to wetlands do not exceed 10,000 SF and there are no impacts to streams or their banks.

The lead people to contact for this project are Wendy Johnson (271-3909 or wendy.johnson@dot.nh.gov) or Matt Urban, Chief Operations Management Section, Bureau of Environment (271-3226 or matt.urban@dot.nh.gov).

A payment voucher has been processed for this application (Voucher #554129) in the amount of \$200.

If and when this application meets with the approval of the Bureau, please send the permit directly to Matt Urban, Chief Operations Management Section, Bureau of Environment.

MRU:mru
Enclosures
cc:
BOE Original
Town of Salem (4 copies via certified mail)
David Trubey, NH Division of Historic Resources (Cultural Review Within)
Bureau of Construction
Carol Henderson, NH Fish & Game (via electronic notification)
Maria Tur, US Fish & Wildlife (via electronic notification)
Mark Kern, US Environmental Protection Agency (via electronic notification)
Michael Hicks, US Army Corp of Engineers (via electronic notification)
Kevin Nyhan, BOE (via electronic notification)
Wendy Johnson (via electronic notification)
Marc Laurin (via electronic notification)

NHDES WETLANDS PERMIT APPLICATION
NH DOT PROJECT #13933A; FHWA #A004(435)

I-93, 4th Lane Expansion from Stateline Through Exit 1

Salem, New Hampshire

PREPARED FOR

NH Department of Transportation
PO Box 483, 7 Hazen Drive
Concord, NH 03302

PREPARED BY

VHB
2 Bedford Farms Drive, Suite 200
Bedford, NH 03110
603.391.3900

December 2018

NHDES WETLANDS PERMIT APPLICATION
NHDOT PROJECT #13933A; FHWA #A004(435)

I-93, 4th Lane Expansion from Stateline Through Exit 1

Salem, New Hampshire

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December 2018

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WETLANDS PERMIT APPLICATION

Water Division/ Wetlands Bureau
Land Resources Management



Check the status of your application: www.des.nh.gov/onestop

RSA/Rule: [RSA 482-A/ Env-Wt 100-900](#)

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No. Check No. Permit Initials
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1. REVIEW TIME: Indicate your Review Time below. To determine review time, refer to [Guidance Document A](#) for instructions.

Standard Review (Minimum, Minor or Major Impact)
 Expedited Review (Minimum Impact only)

2. MITIGATION REQUIREMENT:
 If mitigation is required a Mitigation-Pre Application meeting must occur prior to submitting this Wetlands Permit Application. To determine if Mitigation is Required, please refer to the [Determine if Mitigation is Required Frequently Asked Question](#).

Mitigation Pre-Application Meeting Date: Month: ___ Day: ___ Year: ___

N/A - Mitigation is not required

3. PROJECT LOCATION:
 Separate wetland permit applications must be submitted for each municipality that wetland impacts occur within.

ADDRESS: **Existing Roadway Right-of-Way** TOWN/CITY: **Salem**

TAX MAP: **N/A** BLOCK: **N/A** LOT: **N/A** UNIT: **N/A**

USGS TOPO MAP WATERBODY NAME: **Harris Brook Tributary** NA STREAM WATERSHED SIZE: **334 acres** NA

LOCATION COORDINATES (If known): **42° 45' 5.7" N; 71° 13' 5.9" W** Latitude/Longitude UTM State Plane

4. PROJECT DESCRIPTION:
 Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. DO NOT reply "See Attached" in the space provided below.

The I-93, 4th Lane Expansion from Stateline Through Exit 1 project proposes to dredge and fill approximately 350 SF within wetlands from the proposed widening of a 1.7-mile long segment of Interstate 93 (I-93) in Salem from the Massachusetts state line northward to Exit 1 (referred to as "Contract A"). This project is part of the greater Salem-Manchester 10418C Project, involving widening Interstate 93 (I-93) from three to four lanes, as previously permitted by NHDES (NHDES #2002-02033). This current permit application is being submitted since the previous permit for the project has expired, and to reflect any design changes within the Contract A portion of the project since initial permitting.

Refer to the attached Supplemental Narrative, Figures, and Appendices for more information.

5. SHORELINE FRONTAGE:

NA This does not have shoreline frontage. SHORELINE FRONTAGE:

Shoreline frontage is calculated by determining the average of the distances of the actual natural navigable shoreline frontage and a straight line drawn between the property lines, both of which are measured at the normal high water line.

6. RELATED NHDES LAND RESOURCES MANAGEMENT PERMIT APPLICATIONS ASSOCIATED WITH THIS PROJECT:
 Please indicate if any of the following permit applications are required and, if required, the status of the application.
 To determine if other Land Resources Management Permits are required, refer to the [Land Resources Management Web Page](#).

Permit Type	Permit Required	File Number	Permit Application Status
Alteration of Terrain Permit Per RSA 485-A:17	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Individual Sewerage Disposal per RSA 485-A:2	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Subdivision Approval Per RSA 485-A	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Shoreland Permit Per RSA 483-B	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<u>TBD</u>	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED

7. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:
 See the Instructions & Required Attachments document for instructions to complete a & b below.

a. Natural Heritage Bureau File ID: NHB **18 - 2079**

b. [Designated River](#) the project is in ¼ miles of: _____; and
 date a copy of the application was sent to the [Local River Management Advisory Committee](#): Month: ___ Day: ___ Year: ___

N/A

irm@des.nh.gov or (603) 271-2147
 NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095
www.des.nh.gov

8. APPLICANT INFORMATION (Desired permit holder)LAST NAME, FIRST NAME, M.I.: **Johnson, Wendy**TRUST / COMPANY NAME: **NH Department of Transportation**MAILING ADDRESS: **PO Box 483**TOWN/CITY: **Concord**STATE: **NH**ZIP CODE: **03302-0483**EMAIL or FAX: **wendy.johnson@dot.nh.gov**PHONE: **603-271-3909**

ELECTRONIC COMMUNICATION: By initialing here: _____, I hereby authorize NHDES to communicate all matters relative to this application electronically.

9. PROPERTY OWNER INFORMATION (If different than applicant)

LAST NAME, FIRST NAME, M.I.:

TRUST / COMPANY NAME:

MAILING ADDRESS:

TOWN/CITY:

STATE:

ZIP CODE:

EMAIL or FAX:

PHONE:

ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically.

10. AUTHORIZED AGENT INFORMATIONLAST NAME, FIRST NAME, M.I.: **Walker, Peter**COMPANY NAME: **VHB**MAILING ADDRESS: **2 Bedford Farms Drive, Suite 200**TOWN/CITY: **Bedford**STATE: **NH**ZIP CODE: **03110-6532**EMAIL or FAX: **pwalker@vhb.com**PHONE: **603-391-3900**ELECTRONIC COMMUNICATION: By initialing here: , I hereby authorize NHDES to communicate all matters relative to this application electronically.**11. PROPERTY OWNER SIGNATURE:**

See the Instructions & Required Attachments document for clarification of the below statements

By signing the application, I am certifying that:

1. I authorize the applicant and/or agent indicated on this form to act in my behalf in the processing of this application, and to furnish upon request, supplemental information in support of this permit application.
2. I have reviewed and submitted information & attachments outlined in the Instructions and Required Attachment document.
3. All abutters have been identified in accordance with RSA 482-A:3, I and Env-Wt 100-900.
4. I have read and provided the required information outlined in Env-Wt 302.04 for the applicable project type.
5. I have read and understand Env-Wt 302.03 and have chosen the least impacting alternative.
6. Any structure that I am proposing to repair/replace was either previously permitted by the Wetlands Bureau or would be considered grandfathered per Env-Wt 101.47.
7. I have submitted a Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) to the NH State Historic Preservation Officer (SHPO) at the NH Division of Historical Resources to identify the presence of historical/ archeological resources while coordinating with the lead federal agency for NHPA 106 compliance.
8. I authorize NHDES and the municipal conservation commission to inspect the site of the proposed project.
9. I have reviewed the information being submitted and that to the best of my knowledge the information is true and accurate.
10. I understand that the willful submission of falsified or misrepresented information to the New Hampshire Department of Environmental Services is a criminal act, which may result in legal action.
11. I am aware that the work I am proposing may require additional state, local or federal permits which I am responsible for obtaining.
12. The mailing addresses I have provided are up to date and appropriate for receipt of NHDES correspondence. NHDES will not forward returned mail.



 Property Owner Signature

 Wendy A. Johnson
 Print name legibly


 01/02/19
 Date

MUNICIPAL SIGNATURES

12. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.


	Print name legibly	Date
--	--------------------	------

DIRECTIONS FOR CONSERVATION COMMISSION

1. Expedited review **ONLY** requires that the conservation commission's signature is obtained in the space above.
2. Expedited review requires the Conservation Commission signature be obtained **prior** to the submittal of the original application to the Town/City Clerk for signature.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will be reviewed in the standard review time frame.

13. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 2014), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

	Print name legibly	Town/City	Date
--	--------------------	-----------	------

DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3,I

1. For applications where "Expedited Review" is checked on page 1, if the Conservation Commission signature is not present, NHDES will accept the permit application, but it will NOT receive the expedited review time.
2. **IMMEDIATELY** sign the original application form and four copies in the signature space provided above;
3. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
4. **IMMEDIATELY** distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board; and
5. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

1. Submit the single, original permit application form bearing the signature of the Town/ City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery.

14. IMPACT AREA:

For each jurisdictional area that will be/has been impacted, provide square feet and, if applicable, linear feet of impact

Permanent: impacts that will remain after the project is complete.

Temporary: impacts not intended to remain (and will be restored to pre-construction conditions) after the project is complete.

After-the-fact (ATF): work completed prior to receipt of this application by DES. Check box to indicate ATF.

JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.		TEMPORARY Sq. Ft. / Lin. Ft.	
Forested wetland	350	<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Scrub-shrub wetland		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Emergent wetland		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Wet meadow		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Intermittent stream	/	<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Perennial Stream / River	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Lake / Pond	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Bank - Intermittent stream	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Bank - Perennial stream / River	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Bank - Lake / Pond	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Tidal water	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Salt marsh		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Sand dune		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Prime wetland		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Prime wetland buffer		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Undeveloped Tidal Buffer Zone (TBZ)		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Previously-developed upland in TBZ		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Docking - Lake / Pond		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Docking - River		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Docking - Tidal Water		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Vernal Pool		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
TOTAL	350 /		/	

15. APPLICATION FEE: See the Instructions & Required Attachments document for further instruction

Minimum Impact Fee: Flat fee of \$ 200

Minor or Major Impact Fee: Calculate using the below table below

Permanent and Temporary (non-docking) _____ sq. ft. X \$0.20 = \$ _____

Temporary (seasonal) docking structure: _____ sq. ft. X \$1.00 = \$ _____

Permanent docking structure: _____ sq. ft. X \$2.00 = \$ _____

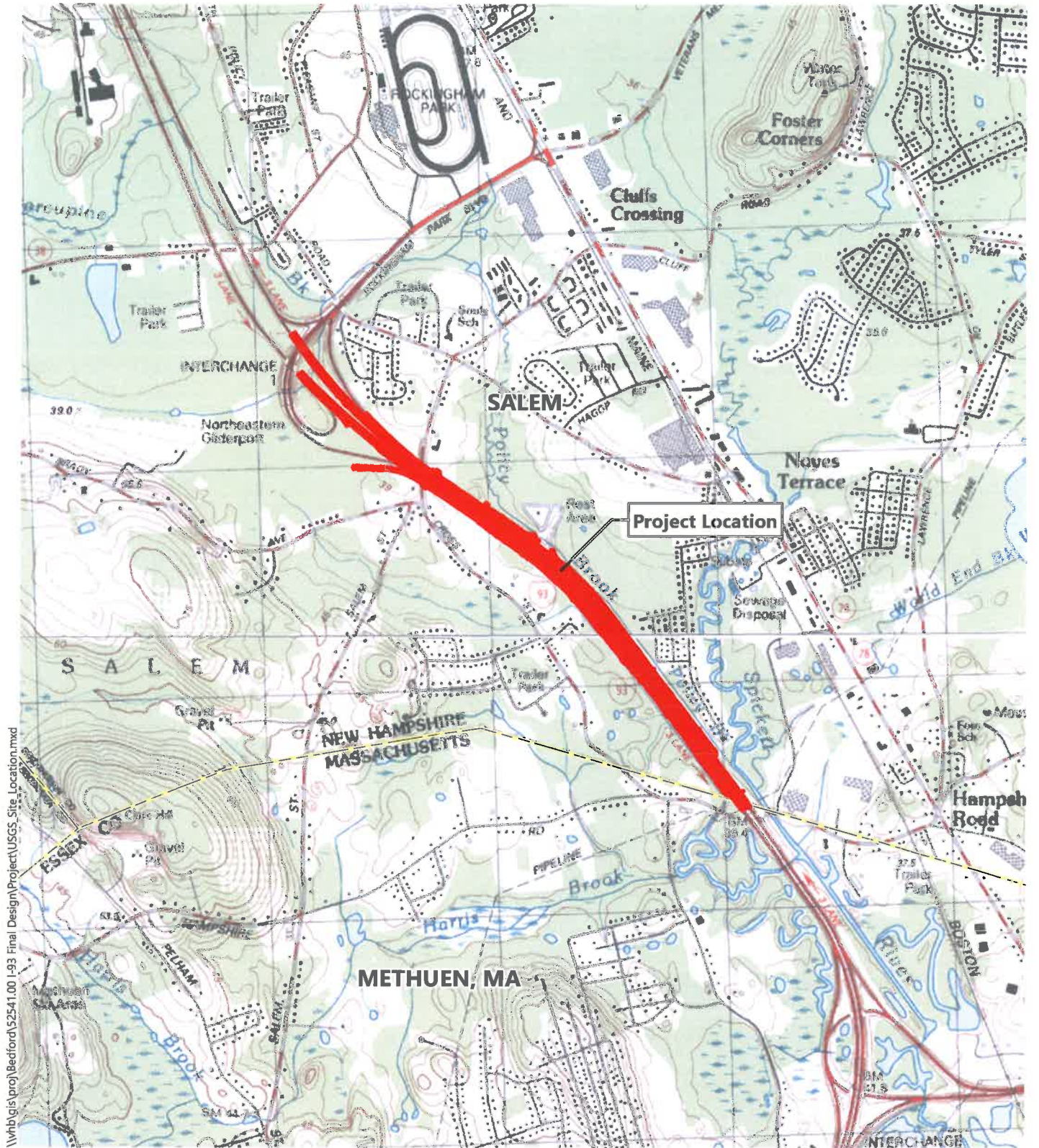
Projects proposing shoreline structures (including docks) add \$200 = \$ _____

Total = \$ _____

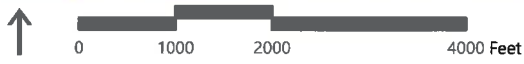
The Application Fee is the above calculated Total or \$200, whichever is greater = **\$ 200.00***

*Minimum Impact Flat Fee

FIGURE 1



\\vhb\gis\proj\Bedford\52541.00 I-93 Final Design\Project\USGS_Site_Location.mxd



- Legend
- Project Location
 - State Boundary

NHDOT I-93
Salem - Manchester 13933A
FHWA A004 (435)

Salem, New Hampshire

I-93 Contract A
USGS Site Location Map

Review Criteria Administrative Rule [Env-Wt 302.04(b)]

Documentation that the project complies with the requirements contained in Env-Wt 302.04(b) of the New Hampshire Code of Administrative Rules is provided below.

1. Type of wetland to be impacted.

Palustrine wetland S-9 is proposed to be impacted by the I-93 roadway widening in Salem. Wetland S-9 is a large palustrine forested (broad leaved deciduous) (PFO1) wetland which continues northwestward after the Harris Brook Tributary terminates. In spots the wetland continues into the yards of residences west of the I-93 corridor. Red maple (*Acer rubrum*) dominates the forest canopy at the USACE plot location. The herb layer consists entirely of slender wood-reed (*Cinna latifolia*). Other plants observed within the wetland include American elm (*Ulmus americana*), glossy false buckthorn (*Frangula alnus*), royal fern (*Osmundastrum spectabilis*), interrupted fern (*Osmunda claytoniana*), jewelweed (*Impatiens capensis*), northeastern manna grass (*Glyceria striata*), and numerous species of sedge (*Carex* spp.).¹

2. Surface areas of wetlands impacted.

Impacts to wetland S-9 include side slope grading and the installation of drainage features along the widened portion of I-93 southbound. No direct impacts to the banks or bed of the Harris Brook Tributary, Policy Brook, or the Spicket River are proposed as part of the project. Additionally, no wetland impacts are anticipated for the widening work proposed along I-93 northbound. Approximately 350 SF of permanent impact to wetland S-9 is anticipated from roadway shoulder slope grading and the installation of

¹ FB Environmental Associates. *Wetland and Stream Delineation and Functional Wetland Assessment Report*. January 2018.

drainage features along the southbound side of the roadway within the Contract A project corridor.

3. Relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.

The palustrine wetland proposed to be impacted is hydrologically connected to the Harris Brook Tributary which runs parallel to the western side of I-93 along the Contract A corridor. The Harris Brook Tributary ultimately flows into the Spicket River just south of the Massachusetts state line. Policy Brook also runs parallel to I-93 to the east and flows into the Spicket River within the vicinity of the Contract A corridor but is not impacted by this project. The Spicket River eventually drains into the Merrimack River approximately 4 miles south of the Contract A corridor.

4. The impact upon abutting owners pursuant to RSA 482-A:11, II.

This project will not adversely impact abutting landowners. The project will not require additional property acquisition beyond what was already acquired through the greater Salem-Manchester 10418C Project. This project includes constructing a new soundwall near the Haigh Avenue neighborhood to mitigate existing highway noise within this neighborhood. The wall would reduce noise and visual impacts of the highway.

5. Lack of alternatives with lesser wetlands and surface water impacts.

During the design process, the environmental team worked closely with the engineering design team to eliminate direct wetland impact. In certain cases, impacts could not be entirely avoided, but these impacts were minimized as much as possible. Attempts were made to eliminate the small areas of proposed wetland impact entirely. However, a few small impacts remain after reducing impacts as much as possible given the various site constraints and highway design requirements. These site constraints result from the close proximity of the highway to the roadside wetlands. The project design uses guardrails along the roadside in certain locations so that the road shoulder can be steeper to minimize impacts to wetlands in close proximity to the roadway.

Supplemental Narrative

1. Introduction

On behalf of the NH Department of Transportation (“the Applicant”), this Wetlands Permit Application was prepared by VHB pursuant to the New Hampshire Revised Statutes Annotated (RSA) Chapter 482-A, Fill and Dredge in Wetlands, and Wetland Bureau Code of Administrative Rules, Chapters Env-Wt 100 through Env-Wt 900. This project involves the expansion of a 1.7-mile long segment in Salem from the Massachusetts state line northward to Exit 1 (referred to as “Contract A”). This project is being submitted as a minimum impact project per Env-Wt 303.04(f) since proposed impacts are less than 3,000 square feet (SF). Contract A is part of the greater Salem-Manchester 10418C Project, that involves the widening of an approximately 19.8-mile segment of I-93 from the Massachusetts/New Hampshire state line to Manchester, which was previously permitted under NHDES Wetlands Application #2002-02033. This current application is being submitted since the previous permit for this section of the project has expired, and to reflect design changes within the Contract A portion of the project since initial permitting.

2. Site Description and Existing Conditions

The Contract A corridor is a 1.7-mile segment of I-93 located within the southern portion of Salem, New Hampshire near the Massachusetts state line (refer to **Figure 1**, USGS Site Location Map). The landscape of this area is characterized by low rolling hills with streams running within areas of lower elevation.

Interstate 93 is a limited (fully controlled) access highway originally constructed in the early 1960s. At present, it consists of six lanes (three lanes northbound, three lanes southbound). The north and southbound barrels follow independent vertical profiles. The Exit 1 interchange is located at the northern limits of Contract A. The median width (distance

between lanes of opposing direction) of I-93 within the Contract A corridor is typically 30 to 40 feet. Additionally, Cross Street passes over I-93 approximately 1,000 feet south of Exit 1.

The area adjacent to I-93 southbound in Salem is zoned as Rural District.² Most of the land use within the vicinity of the Contract A corridor is residential with areas of undeveloped forestland and a small amount of agricultural fields. Additionally, the Salem Rest Area is located on the northbound side of I-93 approximately in the center of the Contract A corridor.

Representative site photos of the Contract A corridor are provided in **Appendix H**.

3. Proposed Project Description

Contract A will include widening both the north- and south-bound barrels of I-93 from three to four lanes. Related work includes minor ramp work to accommodate the widened mainline, drainage improvements, and construction of a soundwall. More detail is provided below.

3.1 Mainline Widening

Contract A would reconstruct and widen I-93 from a three-lane section to a four-lane section in each direction, starting at the Massachusetts state line and continuing north to Exit 1. This is the last mainline segment to be constructed as part of the Salem-Manchester project, and would tie into the previously constructed improvements at Exit 1 (previously constructed as part of Project 13933D or "Contract D").

Under Contract A, work on the northbound barrel would begin at the Massachusetts state line, adding a fourth lane primarily towards the median (west). The four-lane section would continue north to the Salem Rest Area ramps, where it would match into the existing roadway section that already accommodates four through lanes. The Salem Rest Area ramps would be retained in their current location. The northbound limit would extend northerly to a point just south of the Exit 1 ramps bridge to accommodate traffic control to complete the construction of the four-lane segment.

The southbound highway work would consist of adding a fourth lane by step-box widening off the existing travel way. The proposed highway widening is located along the east side into the median (approximately Sta. 3001+50 to Sta. 3027+00 RT) and along the west side, beginning near the Exit 1 southbound on-ramp and continuing south to the Massachusetts state line where the fourth lane is dropped to meet the three-lane section at the state line (approximately Sta. 3001+50 to Sta. 3057+00 LT). The northerly southbound project limit is located just south of the Exit 1 ramps bridge. Minor pavement widening on existing embankment and roadway sub-base placed by the 13933D contract is proposed to widen I-93 southbound to four lanes approximately from Sta. 3072+00 to Sta. 3090+00 RT.

Only minor work is proposed at the Exit 1 on-ramp. The Exit 1 southbound two-lane on-ramp would remain as previously constructed, with minor on-ramp concrete island

² Town of Salem, NH. *Chapter 490: Zoning*. Accessed July 12, 2018. <https://ecode360.com/27551953>.

reconstruction and step-box widening off the existing I-93 southbound travel way (approximately Sta. 3062+80 to Sta. 3074+00) to accommodate the proposed southbound four-lane section through the Exit 1 southbound on-ramp interface. The northbound off-ramp work would also be minor, since Contract D already constructed the northbound ramp to accommodate a four-lane section.

The mainline reconstruction efforts would consist of pavement rehabilitation including cold planning and pavement shimming of existing and step box widening as required, consisting of the full depth of select materials and full depth pavement.

3.2 Drainage Improvements

The proposed project will alter some of the existing drainage features within the Contract A corridor to accommodate the widened I-93 and to improve stormwater runoff and snow melt drainage within the highway, however most of the existing drainage features will be maintained. Two previously-constructed stormwater BMP features will be retained as part of the project, which are two sand filter swales located within the median of the Contract A corridor and a detention basin just north of the rest area northbound on-ramp along the east side of the roadway.

Under existing conditions, much of the stormwater runoff along this segment of the roadway drains to the Harris Brook Tributary. Under proposed conditions a closed drainage system will be constructed to collect stormwater from the inside lanes of both northbound and southbound barrels for approximately 1,800 feet north of the state line. As a result of this closed drainage system, stormwater from approximately 3.6 acres of roadway area will be shifted to Policy Brook and the amount of pavement that drains to the Harris Brook Tributary will be reduced by approximately 0.9 acres. The shifting of flow ensures that pollutant loading to the Harris Brook Tributary will not increase. And, for the overall project, there will be no additional pollutant load to Policy Brook, accounting for the cumulative treatment from the previously constructed stormwater BMPs within the Policy Brook watershed during previous roadway contracts. The estimated pollutant load reductions associated with these BMPs will more than accommodate the estimated additional pollutant loads associated with added pavement draining to Policy Brook. The hydrological impacts of this stormwater system is discussed in **Section 4.2** below.

3.3 Soundwall at Haigh Avenue Neighborhood

As part of the proposed work, Contract A would construct a soundwall along the northbound barrel, approximately 16 feet tall, beginning approximately 400 feet south of the existing dwellings on Haigh Avenue and extending approximately 3,400 feet north to the Salem Rest Area off-ramp. Noise analyses along the Contract A corridor indicate that the design-year noise levels would approach or exceed the FHWA noise abatement criteria at 35 residential receptors on the northbound side of I-93 south of the Salem Rest Area. This soundwall would not have any direct impacts on wetlands or surface waters, including the adjacent Policy Brook system. An existing soundwall on the northbound side of I-93 north of

Cross Street would not be affected by Contract A and would continue to be effective at attenuating highway noise.

3.4 Traffic Control

Contract A would also include upgraded and additional signage, including Intelligent Transportation System (ITS) elements. Overhead Sign Structures (OHSS) would include: two full span (crossing both northbound and southbound) OHSS south of the Salem Rest Area; one OHSS along the northbound off-ramp to the Salem Rest Area, relocated from the existing location south of the Salem Rest Area; one OHSS along the northbound barrel between the off-ramp and on-ramp at the Salem Rest Area; and two full span (crossing northbound) OHSS between the Salem Rest Area and Cross Street. ITS equipment would include one new steel pole to support a closed circuit television camera (CCTV) that will be located at the Salem Rest Area, and relocation of the existing dynamic message sign from the existing cantilevered OHSS to one of the full span OHSSs south of the Salem Rest Area. Some minor wetland impacts to the Harris Brook Tributary are associated with the installation of foundations for two of the proposed OHSS.

4. Impact Analysis and Best Management Practices

4.1 Proposed Impacts

The Contract A project would result in impacts to wetlands from roadway shoulder slope grading and the installation of drainage features along the roadway. (See **Appendix L and M**). Approximately 350 SF of permanent impact to wetland S-9 is anticipated from roadway shoulder slope shaping and grading and the installation of drainage features along the southbound side of the roadway. No temporary wetland impacts are anticipated as part of the proposed project. No wetland impacts are required for the proposed widening along the northbound side of I-93. Additionally, no direct impacts are required within the bed and banks of any surface water, including the Harris Brook Tributary, Policy Brook, or the Spicket River.

During the design process, the environmental team worked closely with the engineering design team to eliminate direct wetland impact. In certain cases, impacts could not be entirely avoided, but these impacts were minimized as much as possible. Attempts were made to eliminate the small areas of proposed wetland impact entirely. However, a few small impacts remain after reducing impacts as much as possible given the various site constraints and highway design requirements. These site constraints result from the close proximity of the highway to the roadside wetlands. The project design uses guardrails along the roadside in certain locations so that the road shoulder can be steeper to minimize impacts to wetlands and streams in close proximity to the roadway.

Hydrological Impacts

Since the project proposes to add approximately 3.1 acres of new pavement area within the project corridor, a hydrological analysis was conducted to assess the potential increases in stormwater peak flow rates during design storms and to determine if adjustments to the existing stormwater system were needed in the project design to accommodate this increase.

Currently, stormwater from the existing impervious areas along the roadway drains either west to the Harris Brook Tributary or east to Policy Brook. Existing stormwater flow releases from the highway consist of a combination of sheet flow via a closed drainage system with catch basin outlets discharging to either side of the highway. Under existing conditions, a majority of the stormwater runoff within the median along the southern segment drains to the Harris Brook Tributary.

The proposed project widening for approximately 1,800 feet northward from the state line will replace the current grassed median with a barrier median which will require a closed drainage system to capture stormwater from the inner two northbound and southbound lanes and will outlet to Policy Brook. The proposed drainage system along this roadway segment will result in approximately 4.0 acres of pavement being redirected to Policy Brook that previously discharged to the Harris Brook Tributary. This shift or redirection of water flow will reduce the amount of pavement draining to the Harris Brook Tributary by approximately 0.9 acres.

To account for these proposed changes in pavement area and flow redirection, potential changes in peak flow rates for the Harris Brook Tributary and Policy Brook were analyzed. The watershed analysis involved two different methodologies. For the Harris Brook Tributary, changes in peak flow rates were calculated using the Hydro-CAD model to estimate changes in peak flow rates for different design storms events. The Hydro-CAD model is appropriate for small watersheds that are less than a 0.5 square mile in size.

The Policy Brook watershed area is over 10 square miles in size and is well above the 0.5 square mile threshold considered appropriate for a HydroCAD model. Given this much larger watershed a different methodology was needed to evaluate the potential change in peak flows to Policy Brook. VHB used a methodology developed by the U.S. Geological Survey based on regression equations developed from stream gage data and watershed characteristics for over 100 different watersheds. The USGS methodology includes separate equations for rural and urban type watersheds, with the urban analysis being defined as watersheds with more than 10% impervious cover. The percent imperviousness for the Policy Brook watershed is estimated to be approximately 20% and, thus, the urban regression equations were used in this analysis.

The results of the peak flow analysis indicate that there are no meaningful changes in peak flow rates for either the Harris Brook Tributary or Policy Brook watersheds. While there are no meaningful changes, peak flows to the Harris Brook Tributary would decrease since the total amount of stormwater flow into the Tributary will be decreased because of the proposed projects' modifications to the existing roadway drainage system. The estimated net change in peak flows is less than 0.1% in Policy Brook even for the 100-year storm event.

The estimated peak flow rates for Policy Brook existing and proposed conditions are presented in the following table.

Table 1. Estimated Changes in Peak Flow Rates in Policy Brook

Design Storm	Estimated Peak Flow (CFS)		Net Change (CFS)
	Existing	Proposed	
2-year / 24-hr rainfall	273.6	273.7	0.1
10-year / 24-hr rainfall	672.6	672.9	0.3
50-year / 24-hr rainfall	1,124.7	1,125.3	0.6
100-year / 24-hr rainfall	1,331.3	1,332.0	0.7

Notes: Peak flow rates for the various design storms is based on the USGS regression equation methodology for urban watersheds.

Similarly, for the Harris Brook Tributary, the estimated peak flow rates under proposed conditions using the Hydro-CAD model show no measurable change for each of the design storm events.

Table 2. Estimated Changes in Peak Flow Rates in Harris Brook Tributary

Design Storm	Estimated Peak Flow (CFS)		Net Change (CFS)
	Existing	Proposed	
2-year / 24-hr rainfall	43.5	43.5	0.0
10-year / 24-hr rainfall	111.4	111.1	-0.3
50-year / 24-hr rainfall	235.4	234.6	-0.8
100-year / 24-hr rainfall	312.3	311.2	-1.1

Notes: Peak flow rates for the various design storms is based on the Hydro-CAD model for the Harris Brook Tributary watershed.

Based on these peak flow analysis results, no additional stormwater detention or peak flow mitigation measures are considered necessary.

4.2 Mitigation and Best Management Practices

4.2.1 Mitigation

According to NHDES Wetland Rule *Env-Wt 302.03(c)(2)(b)*, compensatory mitigation is not required for this project since the project wetland impacts total less than 10,000 square feet.

4.2.2 Best Management Practices

Standard best management practices (BMPs) will be applied throughout project construction in accordance with applicable NHDES and NHDOT BMP Manuals to reduce the risk of erosion and sediment-laden run-off from entering surface waters and wetlands adjacent to the project corridor, since much of the project work will be conducted directly adjacent to wetlands and surface waters. Perimeter controls such as silt fence and/or silt sock will be installed upslope of project wetlands and streams to ensure that surface water run-off from unstabilized areas does not carry silt, sediment, and other debris outside of the limits of

work. All installed temporary erosion control measures shall be inspected daily and repaired/replaced as necessary.

Areas remaining un-stabilized for a period of more than 30 days shall be temporarily seeded and mulched. Erosion control blankets shall be installed on all slopes that are greater than 3 feet horizontal and 1 foot vertical (3:1). Upon the completion of the proposed work, all disturbed and graded areas located upslope of the erosion control measures will be seeded and mulched as needed. Disturbed areas that have been seeded and mulched will be considered stable once 85-percent vegetative growth has been achieved. Refer to the Erosion Control Plans included as **Appendix N** for further details.

Several invasive plant species were identified by FB Environmental Associated (FB) within the project area during field surveys conducted from June to September 2017. The most common invasive plant species found within the Contract A corridor was glossy false buckthorn (*Frangula alnus*). Due to the prevalence of glossy false buckthorn within the survey area, FB did not map the locations of this species, however all of the following invasive species were mapped within the survey area.

- Japanese barberry (*Berberis thunbergii*)
- Asian bittersweet (*Celastrus orbiculatus*)
- Autumn olive (*Elaeagnus umbellata*)
- Japanese knotweed (*Fallopia japonica*)
- Glossy false buckthorn (*Frangula alnus*)
- Morrow's honeysuckle (*Lonicera morrowii*)
- Purple loosestrife (*Lythrum salicaria*)
- Common reed (*Phragmites australis*)
- Multiflora rose (*Rosa multiflora*)

Since soil disturbance is anticipated to occur as part of the proposed project, the contractor(s) will be required to adhere to NHDOT's *Best Management Practices for the Control of Invasive and Noxious Plant Species (2018)* manual during construction to minimize the spread of invasive plant species within the project area. Only clean equipment that is free of plant material and debris shall be delivered to the project site and utilized during construction. All machinery entering and leaving any area containing invasive plants will be inspected for foreign plant matter (stems, flowers, roots, etc.) and soil embedded in the tracks or wheels. If foreign plant matter/soil is present, the operator shall remove the plant material and soil from the machine using hand tools.

5. Wetland Resources

Wetlands and streams within the Contract A corridor were delineated and assessed from June to September 2017, with follow-up verification conducted in December 2018 during a period of a lack of snow-cover. Additionally, potential vernal pools were identified since the delineation was conducted outside of the vernal pool season, however none of these potential vernal pools are proposed to be impacted. A full description of the wetlands and

associated function and values assessment is provided in the delineation report, located in **Appendix K**.

The most common types of wetlands delineated within the Contract A corridor are riparian forested wetlands, riparian emergent wetlands, and emergent wetlands constructed for stormwater treatment. Additionally, several non-jurisdictional drainage areas (scoured channels) were mapped within the Contract A corridor. Several constructed stormwater treatment areas and roadside ditches were found within the corridor, and all such wetlands that met the US Army Corps of Engineers wetland criteria³ were identified as jurisdictional wetland areas. Of all the wetlands delineated within the corridor, only one wetland is proposed to be impacted by the project, which is wetland S-9.

Wetland S-9 a large palustrine forested (broad leaved deciduous) (PFO1) wetland which continues northwestward after the Harris Brook Tributary terminates. In spots the wetland continues into the yards of residences west of the I-93 corridor.

Red maple (*Acer rubrum*) dominates the forest canopy in wetland S-9 at the USACE plot location. The herb layer consists entirely of slender wood-reed (*Cinna latifolia*). Other plants observed within the wetland include American elm (*Ulmus americana*), glossy false buckthorn (*Frangula alnus*), royal fern (*Osmundastrum spectabilis*), interrupted fern (*Osmunda claytoniana*), jewelweed (*Impatiens capensis*), northeastern manna grass (*Glyceria striata*), and numerous species of sedge (*Carex* spp.).

Soils within wetland S-9 meet the criteria for field indicator F-3 – Depleted Matrix as the soil profile contains a 13+ inch layer with a depleted matrix that starts from within ten inches of the mineral soil surface. Water stained leaves (B9) constituted the sole observed indicator of hydrology.

Principal functions for wetland S-9 are floodflow alteration, sediment/toxicant retention, and nutrient removal. Other suitable functions consist of groundwater recharge/discharge, production export, sediment/shoreline stabilization, and wildlife habitat.⁴

One prime wetland is located directly adjacent to the eastern side of the Contract A corridor. The segment of the Spicket River upstream of the river's confluence with Policy Brook is designated as a prime wetland in accordance with RSA 482-A:15. This prime wetland includes a 100-foot buffer, however the buffer is located just outside of the Project's construction footprint, as shown in **Appendix L**.

6. Floodplains and Floodways

Portions of the Contract A corridor are located within the Special Flood Hazard Area (SFHA) Zone AE of the Harris Brook Tributary and Zone A of Policy Brook, as shown on the effective

³ US Army Corps of Engineers. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0*. January 2012.

⁴ FB Environmental Associates. *Wetland and Stream Delineation and Functional Wetland Assessment Report*. January 2018, updated December 2018.

Flood Insurance Rate Maps; Panels 33015C0677E, 33015C0564E, and 33015C0563E, dated May 17, 2005.

A floodplain analysis was conducted in 2018 using a corrected floodplain map which was developed by incorporating the 2005 Digital Flood Insurance Rate Map (DFIRM) data with the topographic and roadway data included in the project plans (refer to **Appendix J**). This enabled the identification of areas where the DFIRM flood boundary clearly did not reflect or was inconsistent with the existing topography information. The floodplain boundary was then modified to reflect topographic conditions and the resultant floodplain data was developed into a computer file containing the digital floodplain and floodway mapping.

Based on the most recent floodplain analysis, the proposed project would impact approximately 1.9 acres of floodplain. Floodplain mitigation for the proposed impacts in Salem has already been completed as part of the greater Salem-Manchester 10418C Project. This mitigation is located at the terminus of Haigh Avenue in Salem, referred to as the Policy Brook Stream Restoration Project. The completed floodplain mitigation work provides ecological benefits with a more sinuous riverine corridor and added flood storage for the smaller, more frequent storm events. Additional measures to mitigate for flood storage impacts include minimizing direct impacts to the 100-year floodplain and floodway of the Spicket River, Policy Brook, and Porcupine Brook.

7. Rare, Threatened, and Endangered Species

The following is a discussion of rare, threatened, and endangered species identified within the vicinity of the project corridor by the New Hampshire Natural Heritage Bureau (NHNHB) Data-check tool and US Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) system.

7.1 Natural Heritage Bureau

A search for the occurrence of rare plant, animal, or natural communities within the vicinity of the Contract A corridor was completed using the NHNHB online Data-check tool. A report provided by the NHNHB dated July 12, 2018 indicated the presence of two plant species, the state endangered meadow garlic (*Allium canadense*) and the state threatened river birch (*Betula nigra*), and one exemplary natural community, the swamp white oak floodplain forest.

Both river birch and meadow garlic occur within wetland areas. During coordination with NHNHB, it was determined that suitable habitat for both meadow garlic and river birch is located within 0.5 miles of the Contract A corridor. During the wetland and surface water delineation conducted by FB Environmental Associates, river birch was documented within the vicinity of the Contract A corridor along the Spicket River, however no impacts are proposed to occur within the Spicket River or its associated wetlands. No river birch were documented along the Harris Brook Tributary or adjacent wetlands. Coordination with the NHNHB via email on October 30, 2018 determined that potential suitable habitat for meadow garlic occurs within the wetlands adjacent to the Harris Brook Tributary, however

since wetland impacts will be linear and are proposed to occur along the toe of slope of the existing I-93 roadway shoulder, no substantial impact to meadow garlic is anticipated, if any are present.

Swamp white oak floodplain forests are dominated by red maple, white pine, and red oak. No swamp white oak floodplain forests were documented within the vicinity of the Contract A corridor. Furthermore, the forested wetlands associated with the Harris Brook Tributary where impacts will occur do not appear to be floodplain wetlands. Therefore, upon consultation with NHHB, no impacts to swamp white oak floodplain forests are anticipated as part of the proposed project.

Email correspondence with the NHHB regarding these plant species and natural communities is provided in **Appendix D**.

7.2 NH Fish and Game Department

The NHHB report also indicated the presence of three vertebrate species within the vicinity of the Contract A corridor, including state endangered spotted turtle (*Clemmys guttata*) and two state species of special concern, the American eel (*Anguilla rostrata*) and redbfin pickerel (*Esox americanus*). The New Hampshire Fish and Game Department (NHF&G) has expressed concerns regarding potential impacts to these species. Based on email correspondence with the NHF&G from November 14, 2018, the proposed work within the vicinity of the Harris Brook Tributary are not anticipated to negatively impact these species. Refer to **Appendix D** for more information.

7.3 US Fish and Wildlife Service

The Contract A corridor was also reviewed for the presence of federally listed or proposed, threatened, or endangered species, designated critical habitat, or other natural resources concerning the USFWSs IPaC system.

The northern long-eared bat (*Myotis septentrionalis*, or NLEB) was listed as federally threatened in 2015. The IPaC Official Species List dated July 3, 2018 indicated the possible presence of NLEB within the vicinity of the project corridor. However, in anticipation of this project, a summer acoustic survey was conducted in July of 2017 to determine the presence/absence of this species. Multiple other bat species were identified within the area, but the results showed that no NLEB were present within the survey area. In correspondence dated July 20, 2018, the USFWS provided a concurrence verification letter (Consultation Code 05E1NE00-2018-I-2273) stating that Contract A is within the scope and adheres to the criteria of the *Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and the Northern Long-Eared Bat* (revised February 2018), and therefore satisfies the requirements under Section 7(a)(2) of the Endangered Species Act of 1973. The official effect determination of "not likely to adversely affect" is valid as long as applicable avoidance and minimization measures are adopted into the final plans and are observed during construction.

8. Cultural Resources

The historical architectural survey for the greater Salem-Manchester 10418C Project was initially completed in 2001 and 2002 and included reconnaissance and intensive level architectural history surveys of individual resources and districts. Two resources in Salem were identified as eligible for listing in the National Register of Historic Places: the Kinzler House (19 Cross Street, #SAL204) and the Armenian Settlement Historic District (Salem Street, Area SAL SF). The NH Division of Historical Resources (NHDHR) and the Federal Highway Administration (FHWA) recommended that the Contract A corridor in Salem be determined as “No Historic Properties Affected” relative to both the Kinzler House and the Armenian Settlement Historic District.

A Memorandum of Agreement (MOA) was executed in August 2002 between FHWA, NHDOT, and the NH State Historic Preservation Officer (NHSPO) that outlined stipulations to be implemented over the course of the undertaking to mitigate the adverse effect on historic properties and to conclude the Section 106 process.

Since the 2002 historic architectural survey, a clarification was made of the boundary of the Armenian Settlement Historic District, a portion of which is located within the vicinity of the Contract A corridor in Salem. The boundaries of the Armenian Settlement Historic District were updated in April 2006, during which the property located at 2 Brady Avenue in Salem (SAL0224) was added to the Historic District as a contributing resource. This historic resource was added to the Effects Memo which was signed by NHDOT, FHWA, and NHSPO on July 16, 2009. The building was acquired and removed under Contract 13933B (or “Contract B”), which included work along the Cross Street Bridge, and the 2009 Effects Memo determined that its removal would result in an adverse effect to the property. Mitigation for the taking of the property included a NH Historic Property Documentation Form, expansion of the district area form for the Armenian Settlement District, and the installation of a state historic marker, which have been completed.

Additionally, a Phase IA sensitivity assessment was completed for the proposed project, during which the Contract A corridor was found to not be sensitive for Post-Contact archaeological resources. Two areas were identified as sensitive for Pre-Contact archaeological resources, but a Phase IB intensive archaeological investigation in the 1990s resulted in a finding of no archaeological resources within these areas.

On August 2, 2018, a revised Request for Project Review (RPR) was submitted to NHDHR for the Contract A project. This RPR was submitted because of the amount of time that had elapsed since the 2009 revised Effects Memo. NHDHR responded by indicating that there were no concerns related to archaeology. NHDHR also recommended additional surveys for certain areas, including the Haigh Avenue neighborhood and the neighborhood at MacGregor Avenue, if impacts would result to these properties. However, upon review of the proposed project, NHDOT and FHWA determined that no such impacts would result and decided that additional surveys were unnecessary.

Refer to **Appendix G** for the NHDHR RPR response, the most recent Effect Memo, and the MOA for the Contract A project.

Appendix A – Natural Resource Agency Coordination Meeting Minutes

BUREAU OF ENVIRONMENT CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting

DATE OF CONFERENCE: July 18, 2018

LOCATION OF CONFERENCE: John O. Morton Building

ATTENDED BY:

<p>NHDOT Matt Urban Sarah Large Ron Crickard Marc Laurin Chris Turgeon Ralph Sanders Tim Mallette Rebecca Martin Ron Grandmaison Jonny Findon-Henry Zack Schmidt Aaron Smart Jacqueline Hozza Tim Dunn Jordan Parent Mike Servetas Wendy Johnson</p>	<p>ACOE Mike Hicks</p> <p>Federal Highway Administration **Jamie Sikora</p> <p>EPA Mark Kern</p> <p>NHDES Lori Sommer Dale Keirstead</p> <p>NHF&G John Magee</p> <p>NH Office of Energy and Planning *Jennifer Gilbert *Samara Ebinger</p>	<p>Consultants/Public Participants Peter Walker Jeremy Degler Ben Martin</p>
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*only attended Warren, #41738 presentation

**only attended Salem-Manchester, #13933A Presentation

(When viewing these minutes online, click on an attendee to send an e-mail)

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH: *(minutes on subsequent pages)*

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Brentwood, #41892	2
Warren, #41738 (X-A004(728)).....	2
Salem-Manchester, #13933A (A004(435)).....	3

(When viewing these minutes online, click on a project to zoom to the minutes for that project)

function during a storm event listed as between October 29th and November 1th 2017 (Major Disaster Declaration approved on January 2, 2018).

The purpose of the project is to return this section of NH 118 to the pre-storm functionality. Currently the slope is untreated and generally sloped at greater than 2H:1V. There are concerns that further detrition could lead to the closure of NH 118. A closure of NH 118 would likely lead to hardship for the surrounding area (approximately 48 mile detour within school and fire districts). The preferred design is to build a retaining wall at the toe of the slope and backfill to the highway using stone to stabilize the embankment. In order to construct the project small machinery will need to be in the river and some tree removal will be required.

- C. Turgeon: Portions of NH 118 were repaired by NHDOT maintenance crews in November 2017; however, the slope repair area located adjacent to Breezy Point (41738 Project area) were considered beyond the scope of NHDOT maintenance crews.
- J. Findon-Henry: The 41738 Warren Project experienced funding delays which have contributed to overall project delays.
- General discussion involving the upstream and downstream impacts. It was noted that the objective of the project is to protect the NHDOT asset.
- M. Urban asks if mitigation can be waived since this is a declared emergency and project purpose is to return comparable service. L. Sommer would like some elaboration on the extent of the impacts and will follow up on whether or not mitigation is required. NHDOT will provide updated plans with subsequent wetland submittals.
- NHDOT: Current plan is to pursue a permit for the preferred design through the standard application process with priority being given during the application review process.
- A request to involve Jaimie Sikora (Federal Highway Representative) early on in the project since it is a Federal project was made.
- General discussion: It is likely that some tree removal will be required to facilitate Construction.
- J. Magee made a suggestion to look at other access points to see which would be the most reasonable.
- R. Martin provided an overview of the floodway and floodplain areas. If the proposed construction were to raise the current anticipated 100 year base flood elevation then a CLOMR would be needed. General consensus from the design team is that the proposed design will not likely increase the 100 year flood elevation but this needs to be confirmed. J Findon-Henry will calculate the anticipated net cross-sectional area adjustment value.
- S. Large on behalf of A. Lamb (Division of Resources and Economic Development – National Heritage Bureau) – No National Heritage Bureau concerns.

This project has not been previously discussed at the Monthly Natural Resource Agency Coordination Meeting.

Salem-Manchester, #13933A (A004(435))

Pete Walker presented the overview of the I-93 lane widening project (3 to 4 lanes) from Exit 1 in Salem to the border with Massachusetts (Contract A). Topics covered included a description of the project (1.7 miles, minor ramp modifications, northbound noise barrier near Haigh Avenue, & stormwater BMPS). Several maps were shown detailing the current project footprint in comparison to the footprint which was previously permitted and described in the SEIS from 2010. Additionally, resource impacts were discussed (Policy Brook, a tributary to Harris Brook, NLEB, exemplary natural communities [swamp white oak floodplain forest], and RTE species [meadow garlic, river birch, American eel, redbfin pickerel, & spotted turtle]), and Pete Walker stressed that coordination with the resource agencies would be ongoing. The possibility of adding a stormwater basin on the southbound side of I-93 with the inclusion of a stream

relocation of the tributary to Harris Brook was also discussed. The presentation ended with a description of potential stream & wetland impacts; wetland impacts resulting from Contract A would be substantially decreased from the level of impact anticipated in the previous I-93 wetlands permits. Specifically, under the current plan, total wetland impacts would decrease from approximately 3.9 acres to less than 0.5 acre. Stream channel impacts would also be reduced from 3,549 linear feet (2004 FEIS) to about 3,200 linear feet. It was stressed that these impact numbers are preliminary, as the design of this project is ongoing. The project is currently in a NEPA phase, but is on a very aggressive schedule.

Lori Sommer voiced concerns regarding the decrease in wetland impacts and what factors led to this decrease. Pete Walker replied that the project footprint has decreased compared to previous plans. For example, the proposed limits of grading have been substantially reduced relative to the permit plans, especially along the west side of the highway. Additionally, the previous permit application relied on old wetland mapping (largely aerial-based), whereas the new impact estimates use a field delineation completed by FB Environmental in 2017 which found substantially less wetland.

Mike Hicks asked about permitting, and if any new permits would be required. Pete Walker replied that the Section 404 permit from the USACE is still in effect, but updated impacts would be submitted. The NHDES Wetlands Permit has expired, and NHDOT would be submitting a new application for Contract A. A field trip to visit the Haigh mitigation site and the portion of the tributary of Harris Brook with the proposed basin was suggested by the DES.

Mark Kern asked to further discuss the stormwater BMP and the corresponding impacts to the tributary to Harris Brook. Lori Sommer asked about any alternatives to this BMP and voiced her concerns regarding a stream relocation and the accelerated timeframe of this project. Peter Clary explained that the location of the basin as planned is in a low area where stormwater will naturally flow. A discussion ensued regarding alternatives to this plan, including finding ways to discharge into Policy Brook where pollutant loading credits exist.

Jennifer Gilbert requested additional information about the location of any floodplains within the project area. Pete Walker provided an explanation of the location of floodplains and floodways in the area, and indicated that the Haigh Avenue mitigation project was intended to provide full mitigation for floodplain impacts in Salem.

The remainder of the discussion returned to the stormwater issue and the potential relocation of the basin, where Peter Clary discussed several options to explore to remove the BMP in question, including diverting flow to Policy Brook and constructing dry swales in the median. VHB will continue the project design process keeping these issues in mind.

This phase of the project has not been previously discussed at the Monthly Natural Resource Agency Coordination Meetings.

BUREAU OF ENVIRONMENT CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting

DATE OF CONFERENCE: November 21, 2018

LOCATION OF CONFERENCE: John O. Morton Building

ATTENDED BY:

NHDOT

Matt Urban
Sarah Large
Ron Crickard
Tim Boodey
James McMahon III
Rebecca Martin
Meli Dube
Chris Carucci
Julius Nemeth
Don Lyford
Bill Saffian
Tony King
Trent Zanes
Wendy Johnson
Marc Laurin
Jason Tremblay
Jon Hebert

Kevin Nyhan
Hans Weber
Ron Kleiner

ACOE
Mike Hicks

EPA
Mark Kern

NHDES
Gino Infascelli
Lori Sommer
Dale Keirstead

NHF&G
Carol Henderson
John Magee

NHB

Amy Lamb

The Nature Conservancy
Pete Steckler

**Consultants/Public
Participants**

Christine Perron
Pete Walker
Lindsay Matras
Jason Hilton
Chris Fournier

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH: *(minutes on subsequent pages)*

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Hinsdale-Brattleboro, #12210C (A004(152))	6
Salem-Manchester, #13933A (A004(435))	9
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(When viewing these minutes online, click on a project to zoom to the minutes for that project)

State-listed plants were briefly discussed. McFarland Johnson completed a plant survey and identified populations of two species in the river, primarily along the western and southern shoreline of the island. A. Lamb asked if the trestle finger at Pier 4 could be relocated to avoid impacting the rare plant populations that are located between Pier 4 and the island. B. Saffian stated that the trestle finger could be moved to the west side of Pier 4. A. Lamb noted that there is a historical record of another species on the island that grows in sandy areas. She asked if it would be possible to review the area again prior to construction. Ron Crickard said that would be possible. A. Lamb asked if any vegetation was seen in the river in the vicinity of the boat launch. This question and any other outstanding questions regarding rare plants will be addressed at a follow up meeting with Amy Lamb.

This project has been previously discussed at the 1/22/1998, 5/20/2009, 11/15/2017, 2/21/2018, 4/18/2018 Monthly Natural Resource Agency Coordination Meetings.

Salem-Manchester, #13933A (A004(435))

P. Walker summarized the I-93 Contract A project, which proposes to widen the I-93 highway from three to four lanes south of Exit 1. Total wetland impacts will be less than 1,300 square feet and include impacts to Wetlands S-9 (drainage outlets), S-10 (a constructed ditch line), and M-13 (roadside drainage). P. Walker explained that the project design was modified following the July 2018 RAM to avoid impacts to the Harris Brook Tributary by eliminating a proposed stormwater BMP. Instead, the project design intends to use surplus pollutant loading credits in Policy Brook generated by previous stormwater BMPs constructed during Contracts D & E. Contract A would shift a small amount of stormwater from the Harris Brook Tributary watershed to the Policy Brook watershed. This shift in watershed area will not be significant given the overall large size of each watershed. There will be less than a 0.1% increase of flow to Policy Brook and a 0.3% reduction of flow to the Harris Brook Tributary.

P. Walker then reviewed proposed impacts within the protected shoreland of the Spicket River and Policy Brook. A total of 27 acres of protected shoreland is within the project limits. The majority of these impacts will be within the existing highway infrastructure. P. Walker described the proposed impervious area impacts within the natural woodland, and waterfront buffers of the protected shoreland. Tree removal will occur within the waterfront buffer due to the construction of a soundwall. Mitigation for this tree removal is still being discussed and will be developed under a separate remedial planting contract at the adjacent Haigh Avenue mitigation site.

Finally, P. Walker gave an update on NH Natural Heritage Bureau (NHNHB) and NH Fish and Game Department (NHF&G) coordination. The project impacts are not within areas where the listed plant species, nor the natural community, are likely to occur. No direct impacts will occur within the Spicket River/Policy Brook, therefore the vertebrate species identified on the NHNHB report are not anticipated to be impacted. Correspondence with Amy Lamb (NHNHB) and Melissa Doperalski (NHF&G) indicated no concerns based on the reduction of proposed impacts.

M. Hicks asked about potential cultural resource impacts. M. Hicks also asked if there are any historic districts near the project. P. Walker answered that there is an Armenian Settlement Historic District in Salem, but it is not impacted by the project. P. Walker also noted that a Section 106 Request for Project Review had been submitted to NHDHR for their review. NHDHR requested survey of the "Mac" Subdivision/Haigh Avenue area if these would be impacted by the project, but FHWA and NHDOT concluded there would be no impacts to these areas as all work is within the existing I-93 right-of way. L. Sommer asked if the pollutant loading information was reviewed by NHDES staff yet. W. Brooks confirmed that M. Hemmerlein had sent information to Gregg Comstock, but was unsure if a response was received from NHDES.

D. Keirstead asked if there would be wetland impacts near the northbound off-ramp of the Salem Rest Area. P. Walker explained that no wetlands within the vicinity of the Salem Rest Area will be impacted. Work planned within this area includes minor paving/stripping. The SEIS included work around the Salem Rest Area, however this work has been removed from the project. Matt Urban noted that NHDOT is planning to perform maintenance work on the on- and off-ramps of the rest area's Policy Brook culverts, but that work is unrelated to Contract A.

P. Walker concluded the meeting noting that the draft wetlands permit application and shoreland permit application are under review by NHDOT and should be ready for submittal to NHDES soon.

This project has been previously discussed at the 7/18/2018 Monthly Natural Resource Agency Coordination Meeting.

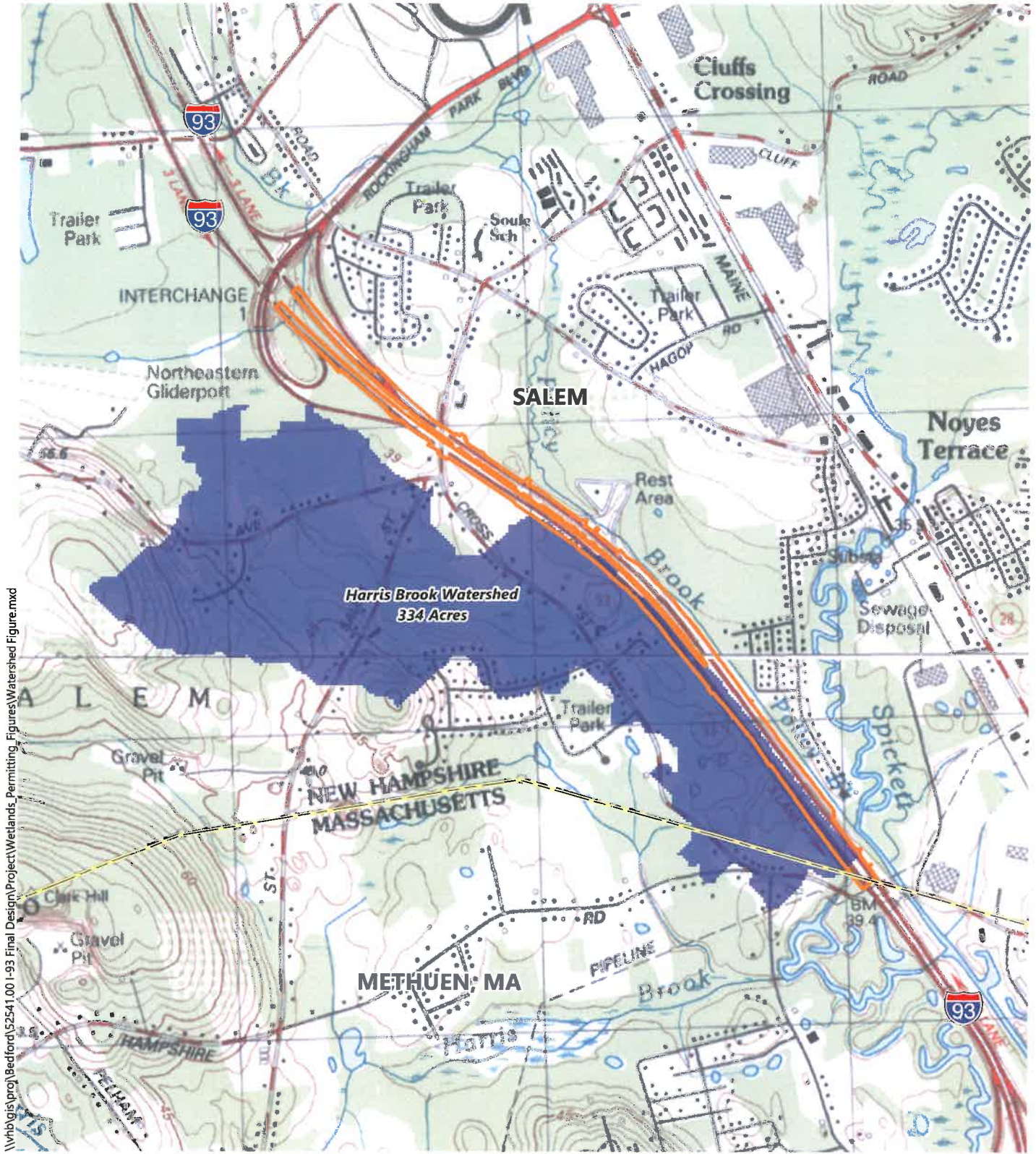
Bennington, #29486 (X-A004(156))

Meli Dube (NHDOT Bureau of Environment) introduced the proposed project, which will rehabilitate or replace the existing concrete box bridge carrying South Bennington Road over Russell Brook in the Town of Bennington. The intent of review by the Natural Resource Agencies at this time is for initial feedback to help inform design decisions moving forward, including consultation with the public. Jason Tremblay (NHDOT Bureau of Bridge Design) explained that the existing bridge is on the State red list due to the poor condition of the deck, superstructure and substructure. The current structure measures 10' wide by 7' tall and was built in 1925 and widened in 1975 but has not received any other major repairs or reconstructions. J. Tremblay explained that rehabilitation is still being considered at this time due to the Section 106 consultation process, however, replacement is more likely due to the deteriorated condition of the bridge. At this time, the replacement options include a 22' wide 4 sided buried structure with simulated streambed material or a 22' wide open-bottomed structure built on either a spread footing or piles. Geotechnical information is being requested to determine what kind of foundation will be required if an open-bottomed structure is proposed. The Town will be consulted in the coming months regarding which option they prefer, as well as to gather input regarding traffic control to determine if the bridge can be closed and construction streamlined or if the bridge must remain open and therefore require temporary widening for either alternative.

M. Dube gave a summary of the environmental review up to this point. There are no conservation lands in the project area and the State National Flood Insurance Program Coordinator has confirmed that the work is located outside of regulatory floodways and that no further coordination is necessary. The NH Natural Heritage Bureau has been consulted and indicated that there are records of wood turtle in the area and the US Fish and Wildlife Service Information for Planning and Conservation tool was used to determine that the project area is located in the range of the northern long-eared bat. The project area is located within ¼ of the designated Contoocook River. The Contoocook River Local Advisory Committee has been contacted and indicated that their preference is a three sided structure with natural stream bottom.

Michael Hicks, US Army Corps of Engineers, asked if the proposed alternatives would impact wetland impacts. J. Tremblay replied that the alternatives will affect whether temporary widening is necessary to keep the bridge open or if it can be closed, the alternatives will affect the length of time the closure is in place. Potential temporary widening will increase the wetland impacts in the project area. Gino Infascelli, NHDES Wetlands Bureau, asked if the wetlands have been delineated and noted that the option to close the road is preferred as there are lots of wetlands surrounding the bridge. M. Dube explained that delineations were completed by a consultant in November 2013, a new delineation will be completed in the spring of 2019. Lori Sommer, NHDES Wetlands Bureau, asked if the crossing has been evaluated in SADES and Sarah Large, NHDOT Bureau of Environment, indicated that she does not believe it has. Carol Henderson,

Appendix B – Watershed Map



\\hbgis\proj\Bedford\52541.00 I-93 Final Design\Project\Wetlands_Permitting_Figures\Watershed Figure.mxd



- Legend**
- Contract A Construction Footprint
 - Harris Brook Watershed
 - State Boundary

**NHDOT I-93
Salem - Manchester 13933A
FHWA A004 (435)**

Salem, New Hampshire

I-93 Contract A

Harris Brook Watershed Map

Source: VHB, NHGRANT



Appendix C – NHHNB Results

CONFIDENTIAL – NH Dept. of Environmental Services review

Memo



NH NATURAL HERITAGE BUREAU
NHB DATACHECK RESULTS LETTER

To: Jeremy Degler, VHB
2 Bedford Farms Drive
#200
Bedford, NH 03110

From: Amy Lamb, NH Natural Heritage Bureau

Date: 7/12/2018 (valid for one year from this date)

Re: Review by NH Natural Heritage Bureau

NHB File ID: NHB18-2079 Town: Salem

Location: I-93 Corridor from State Line to Exit 1

Description: Widening of I-93 from 3 to 4 lanes.

cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments: Please provide NHB with more information about impacts at the south end of the project near the Spicket River, where two state-listed plant species and an exemplary natural community have been documented. Please contact the NH Fish & Game Department to address wildlife concerns.

Natural Community	State ¹	Federal	Notes
Swamp white oak floodplain forest*	--	--	Threats are primarily changes to the hydrology of the river, land conversion and fragmentation, introduction of invasive species, and increased input of nutrients and pollutants.

Plant species	State ¹	Federal	Notes
meadow garlic (<i>Allium canadense</i> var. <i>canadense</i>)*	E	--	Threats are primarily those that would affect this plant's habitat (river or streambanks, forested swamps, low floodplain forest/moist thickets, wet meadows), including changes to local hydrology.
river birch (<i>Betula nigra</i>)*	T	--	The population could be deleteriously affected by any project activities that alter the hydrology of its habitat, by increased sedimentation, and by increased nutrients/pollutants in stormwater runoff.

Vertebrate species	State ¹	Federal	Notes
American Eel (<i>Anguilla rostrata</i>)	SC	--	Contact the NH Fish & Game Dept (see below).
Redfin Pickerel (<i>Esox americanus americanus</i>)	SC	--	Contact the NH Fish & Game Dept (see below).

CONFIDENTIAL – NH Dept. of Environmental Services review

Memo



NH NATURAL HERITAGE BUREAU
NHB DATACHECK RESULTS LETTER

Spotted Turtle (*Clemmys guttata*)

T -- Contact the NH Fish & Game Dept (see below).

¹Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Appendix D – NHHNB & NHF&G Correspondence

Matras, Lindsay

From: Lamb, Amy <Amy.Lamb@dncr.nh.gov>
Sent: Tuesday, October 30, 2018 3:41 PM
To: Matras, Lindsay
Cc: Walker, Peter; Laurin, Marc; Urban, Matt
Subject: RE: [External] RE: Request for Further Review - NHB18-2079
Attachments: I-93_WETLAND_S1a (1).jpg; I-93_Wetland_S9_1594.JPG

Hi Lindsay,

Thank you for sending the photos of Wetland S-9 and S-1 and stream S-S1 (the Harris Brook Tributary), as well as the Wetland and Stream Delineation and Functional Assessment Report prepared by FB Environmental in January 2018.

The photo labeled "1-93_WETLAND_S1a (1).jpg" is the same as photo 52 in the wetlands and stream delineation report, which is said to depict "The typical character of the Harris Brook tributary (Stream S-S1)" in the report. Please clarify if this photo shows Stream S-S1 or Wetland S1. (It may be that the photo was taken where Stream S-S1 flows through Wetland S1.)

Impacts to Stream S-S1, according to the 10-12-2018 impact plan, occur where there are no flanking wetlands. This area would likely not support meadow garlic.

Impacts to wetland S-9 consist of approximately 800 square feet of impacts to palustrine forested wetlands that are the headwaters to Harris Brook tributary, and occur at the toe of slope of the west side of I-93. The photos of wetland S-9 indicate that some areas map provide higher quality forested wetland habitat, which could be habitat for meadow garlic. According to the Wetland Impacts Mapbook document dated 10-12-2018, the impacts to this wetland are linear in nature, and appear to be spread out over approximately 100 feet, thus having an average width of 8'. Since impacts will occur at the toe of existing and proposed slopes of I-93, and consist of a long narrow strip of impacts, it is unlikely that this would cause substantial impact to meadow garlic habitat. Although it is unknown whether any of the photos provided were taken at impact areas, I suspect that the attached photo (I-93_Wetland_S9_1594.jpg) may be representative of impact areas, since the highway is visible in the background.

Overall, wetland impacts have been greatly reduced and appear to be mostly outside of potential rare plant habitat areas. Provided that impacts are restricted to those indicated on current plans, and appropriate erosion controls are in place prior to and during construction to prevent additional impacts and siltation of wetland habitat, NHB feels that the proposed impacts are reasonable and are not likely to have substantial negative impacts on meadow garlic habitat. Please contact me if project impacts change.

Thank you,
Amy

Amy Lamb
Ecological Information Specialist
(603) 271-2834
amy.lamb@dncr.nh.gov

NH Natural Heritage Bureau
DNCR - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Matras, Lindsay [mailto:lmatras@vhb.com]
Sent: Friday, October 26, 2018 9:15 AM
To: Lamb, Amy
Cc: Walker, Peter; Laurin, Marc; Urban, Matt
Subject: RE: [External] RE: Request for Further Review - NHB18-2079

Hi Amy,

Attached are some photos we received from FB Environmental this morning. These include photos of Wetland S-1 (which will not be impacted), stream S-S1 (the Harris Brook tributary), and wetland S-9. These are additional representative photos of these wetlands/surface waters. The exact locations of these photos are unknown. Hopefully this will provide you with the information you need.

Thank you,

Lindsay Matras
Environmental Scientist

P 603.391.3916
www.vhb.com

From: Matras, Lindsay
Sent: Thursday, October 25, 2018 11:31 AM
To: 'Lamb, Amy' <Amy.Lamb@dncr.nh.gov>
Cc: Walker, Peter <PWalker@VHB.com>; 'mlaurin@dot.state.nh.us' <mlaurin@dot.state.nh.us>; 'murban@dot.state.nh.us' <murban@dot.state.nh.us>
Subject: RE: [External] RE: Request for Further Review - NHB18-2079

Hi Amy,

As discussed, I am sending you the wetland delineation report for the project completed by FB Environmental (with some appendices excluded due to size). Please let me know if this report provides you with the information you are looking for regarding impacts to the Harris Brook tributary (S-S1) and the palustrine forested wetland (S-9). We will continue to work on getting photos from FB Environmental of these areas of concern.

Project construction is anticipated to start in Spring 2019. Areas that are proposed to be impacted are because of slope shaping and grading from the widened roadway or from footings for overhead sign structures. Impacts within wetlands/streams have been minimized as much as possible. For example, the project design includes the use of guardrails along the roadway so that the road shoulders could be steeper to minimize impacts.

Upon review of the wetland delineation report, please let me know if you will need any more information.

Thank you,

Lindsay Matras
Environmental Scientist

P 603.391.3916
www.vhb.com

From: Lamb, Amy <Amy.Lamb@dncr.nh.gov>
Sent: Monday, October 22, 2018 1:12 PM
To: Matras, Lindsay <lmatras@vhb.com>

Cc: Walker, Peter <PWalker@VHB.com>; Degler, Jeremy <jdegler@vhb.com>
Subject: RE: [External] RE: Request for Further Review - NHB18-2079

Hi Lindsay,

I do have that photo package already, but was hoping that you might have photos of the actual wetland impact areas. Is FB Environmental still involved with the project? Do you have a contact there that I could reach out to for the requested information?

Amy Lamb
Ecological Information Specialist
(603) 271-2834
amy.lamb@dncr.nh.gov

NH Natural Heritage Bureau
DNCR - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Matras, Lindsay [<mailto:imatras@vhb.com>]
Sent: Monday, October 22, 2018 1:09 PM
To: Lamb, Amy
Cc: Walker, Peter; Degler, Jeremy
Subject: RE: [External] RE: Request for Further Review - NHB18-2079

Hi Amy,

VHB did not complete the wetland delineation field work for this project so we have limited access to photos along this corridor, however here are some photos from the delineation report completed by FB Environmental Associates.

Photo 32 is of the Harris Brook tributary, and photo 40 is of the PFO wetland. The photos may or may not be within areas of proposed impact.

Please let me know if you need anything else. Thanks!

Lindsay Matras
Environmental Scientist

P 603.391.3916
www.vhb.com

From: Lamb, Amy <Amy.Lamb@dncr.nh.gov>
Sent: Monday, October 22, 2018 12:56 PM
To: Matras, Lindsay <imatras@vhb.com>
Subject: RE: [External] RE: Request for Further Review - NHB18-2079

Hi Lindsay,

Thank you for sending the updated plans. Do you happen to have any photos of the areas where wetland impacts have been added? The ones I am interested in are listed below:

Stream Bed - 325 sq ft (sheet 1)
PFO1E impacts, particularly the 760 sq ft impact (sheet 2)

Thank you,
Amy

Amy Lamb
Ecological Information Specialist
(603) 271-2834
amy.lamb@dncr.nh.gov

NH Natural Heritage Bureau
DNCR - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Matras, Lindsay [<mailto:lmatras@vhb.com>]
Sent: Wednesday, October 17, 2018 12:00 PM
To: Lamb, Amy
Cc: Walker, Peter; Degler, Jeremy; Hilton, Jason; Martin, Benjamin
Subject: RE: [External] RE: Request for Further Review - NHB18-2079

Hi Amy,

Attached is a wetland impact map from July as well as the updated wetland impact map with call-outs indicating areas where wetland impacts have been reduced and areas where impacts have increased. Overall, impacts to the bed and bank of the Harris Brook Tributary have significantly decreased. Some minor impact to the bed and bank of the tributary remain in two locations, however all remaining wetland and stream impacts have been reduced by the use of guardrails along portions of the highway to allow for steeper slope lines to avoid impacts.

Please let us know if you have any concerns regarding these anticipated impacts.

Lindsay Matras
Environmental Scientist

P 603.391.3916
www.vhb.com

From: Lamb, Amy <Amy.Lamb@dncr.nh.gov>
Sent: Thursday, September 27, 2018 1:31 PM
To: Walker, Peter <PWalker@VHB.com>
Cc: Degler, Jeremy <jdegler@vhb.com>; Matras, Lindsay <lmatras@vhb.com>; Hilton, Jason <JHilton@VHB.com>
Subject: RE: [External] RE: Request for Further Review - NHB18-2079

Hi Pete,

Thanks for your reply and explanation. I will keep an eye out for a new plan around the 10/10/18 timeframe.

Best,
Amy

Amy Lamb
Ecological Information Specialist
(603) 271-2834
amy.lamb@dncr.nh.gov

NH Natural Heritage Bureau
DNCR - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Walker, Peter [<mailto:PWalker@VHB.com>]
Sent: Thursday, September 27, 2018 8:52 AM
To: Lamb, Amy
Cc: Degler, Jeremy; Matras, Lindsay; Hilton, Jason
Subject: RE: [External] RE: Request for Further Review - NHB18-2079

Hi Amy –

Our highway team is working on the slope and drain plan set, which should be submitted to NHDOT on October 8. That submittal will confirm grading/slope limits and will be the basis for our wetland permit application. So, while we could provide a plan now, I think we should wait until after that task to provide the plan comparison you request below. We do have some time to work through this – our NEPA re-evaluation has been approved by FHWA – it was that review that was creating some urgency. Now, we'll move on the actual permitting phase which will follow a somewhat less ambitious schedule.

The important thing to understand is that we have eliminated the proposed stormwater basin on the west side of the highway that would have created a substantial impact to the Harris Brook Tributary and its related wetland system. All impacts appear to involve ditch lines and relatively low-value wetlands along the existing highway slopes.

Jeremy – Can you work with Jason and Steph to develop a plan comparison for submittal to Amy on or around 10/10?

Peter J. Walker
Principal, Environmental Services

P 603.391.3942
www.vhb.com

From: Degler, Jeremy
Sent: Thursday, September 27, 2018 8:13 AM
To: Matras, Lindsay <lmtras@vhb.com>; Walker, Peter <PWalker@VHB.com>
Subject: Fw: [External] RE: Request for Further Review - NHB18-2079

From: Lamb, Amy <Amy.Lamb@dncr.nh.gov>
Sent: Wednesday, September 26, 2018 3:26:49 PM
To: Degler, Jeremy
Subject: [External] RE: Request for Further Review - NHB18-2079

Jeremy,

Thank you for your email and for sending the letter with updated wetland impacts for this project. Please send an updated site plan showing the current proposed wetland impacts, as well as the areas where impacts have been removed.

Thank you
Amy

Amy Lamb
Ecological Information Specialist
(603) 271-2834
amy.lamb@dncr.nh.gov

NH Natural Heritage Bureau
DNCR - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Degler, Jeremy [<mailto:jdegler@vhb.com>]
Sent: Monday, September 17, 2018 1:49 PM
To: Lamb, Amy
Cc: Walker, Peter; Martin, Benjamin; Matras, Lindsay
Subject: Request for Further Review - NHB18-2079

Good afternoon Amy –

In July, we had discussed a project in which VHB is assisting the New Hampshire Department of Transportation with a lane widening project of I-93 from the New Hampshire – Massachusetts state line to Exit 1. Due to coordination with your agency and several others, changes have been made since that time in the proposed project in order to avoid impacts to critical species and habitat.

I've attached a packet including the updated information, VHB would like know if the Natural Heritage Bureau concurs with our assessment that these changes avoid any effects to those resources listed in the original NHB Report (NHB18-2079). Please feel free to contact me at any time if you require any additional information.

Much appreciated,

Jeremy Degler
Environmental Scientist



2 Bedford Farms Drive
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jdegler@vhb.com

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Degler, Jeremy

From: Lamb, Amy <Amy.Lamb@dncr.nh.gov>
Sent: Thursday, July 19, 2018 10:05 PM
To: Degler, Jeremy
Subject: RE: [External] RE: Request for Review - NHB18-2079

Hi Jeremy,

Thank you for sending the photo log and photo locus.

It is slightly difficult to tell looking at this on my mobile device, but it appears that photo 3 (wetland N-2) shows a river birch tree and floodplain habitat for meadow garlic. I recognize that there will be no impacts to this wetland system, however it is important to note that this system and rare plant habitat is just outside the project area.

Regarding the proposed wetland impacts, I believe I confused wetland S-1 with wetland S-22, as S-1 is a riparian wetland displaying some characteristics indicating that it could potentially support meadow garlic. The Harris Brook tributary associated with this wetland is hydrologically connected to the floodplain downstream, but I am not sure if S-1 is intact enough or subject to flooding in order to support meadow garlic.

You indicated that S-4, S-5, and S-6 may be impacted to create storm water structures, and that these wetlands are similar to S-1. Therefore I would also need more information about these wetlands to determine whether they might support meadow garlic.

Perhaps NHB can recommend a permit condition to review these sites in the field prior to final design (for the storm water basin) or construction. Please let me know your thoughts.

Best,
Amy

Sent with BlackBerry Work
(www.blackberry.com)

From: Degler, Jeremy <jdegler@vnh.com<mailto:jdegler@vnh.com>>
Date: Wednesday, Jul 18, 2018, 1:35 PM
To: Lamb, Amy <Amy.Lamb@dncr.nh.gov<mailto: Amy.Lamb@dncr.nh.gov>>
Subject: RE: [External] RE: Request for Review - NHB18-2079

Amy -

Please see attached for the photolog from the delineation report and the map to make sense of the naming convention. Of these wetlands, the impacts are restricted to:

56 sqft of Wetland S-1
177 sqft of Wetland S-9
64 sqft to M-13

Additionally, there will be 302 and 60 linear feet of impacts to Wetlands S-10 and S-11, respectively. Both of these are roadside ditches.

The plans for a stormwater BMP to mitigate the increase in impervious surface are up in the air, and may impact small portions of additional wetlands (potentially Wetlands S-4, S-5, & S-6) and the tributary to Harris Brook. Any impacts for this BMP will be in areas

very similar to Wetland S-1. The plans are currently being updated per discussions with the NHDES Wetland Bureau.

Let me know if there's anything else I can provide such as the USACE data sheets or anything else.

Thanks again for all of your help on this,

Jeremy Degler, PWS
Environmental Scientist

P 603.391.3867
www.vhb.com<<http://www.vhb.com>>

-----Original Message-----

From: Lamb, Amy [mailto:Amy.Lamb@dncr.nh.gov]
Sent: Wednesday, July 18, 2018 11:56 AM
To: Degler, Jeremy <jdegler@vhb.com>
Subject: RE: [External] RE: Request for Review - NHB18-2079

Hi Jeremy,

Thank you, this is helpful. Based on the plan sheets, there seems to be no wetland impact in the vicinity of the Spicket River floodplain, and as you noted the swamp white oak floodplain forest was not documented within the project footprint. Both species are primarily associated with floodplains, although both can occur at the upland edge of floodplains. The forested wetlands associated with Harris Brook is not likely to support this species as they do not appear to be floodplain wetlands. If this is not the case please let me know. Otherwise, since wetland impacts will be minimal along the Spicket River and areas of appropriate habitat, I don't anticipate impacts to these two species. However, if you have any photos of the wetland and adjacent upland impacts, please send them to me so that I can review and make sure that there will be no impacted habitat.

Thank you,
Amy

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(www.blackberry.com<<http://www.blackberry.com>>)

From: Degler, Jeremy <jdegler@vhb.com<mailto:jdegler@vhb.com>>
Date: Wednesday, Jul 18, 2018, 5:50 AM
To: Lamb, Amy <Amy.Lamb@dncr.nh.gov<mailto: Amy.Lamb@dncr.nh.gov>>
Subject: RE: [External] RE: Request for Review - NHB18-2079

Amy -

Thank you so much for your help on this! A new delineation and rare plant survey was completed in 2017 and I just went through their report and USACE data sheets, and no swamp white oak floodplain forest was identified within the proximity of the proposed project area (red maple-white pine-red oak dominated). No river birch or meadow garlic habitat was observed in this report, but I don't believe the delineators were looking for meadow garlic habitat.

I've attached plan sheets for the impacts associated with this project.

Jeremy Degler, PWS
Environmental Scientist
P 603.391.3867

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-----Original Message-----

From: Lamb, Amy [mailto: Amy.Lamb@dncr.nh.gov]
Sent: Tuesday, July 17, 2018 9:31 PM
To: Degler, Jeremy <jdegler@vvhb.com>
Subject: [External] RE: Request for Review - NHB18-2079

Hi Jeremy,

I am currently in northern NH all week for field work, so I won't be able to attend tomorrow's meeting, but I hope this email gets to you in time. I do have a couple clarifying questions about the work.

You noted that there would be no land conversion in the swamp white oak floodplain forest, but that wetland impacts here would be mitigated. Since this community has been documented along the Spicket River but not immediately adjacent to the project area, can you clarify whether this community was also documented in proximity to the highway and proposed expansion? If this forest type has been identified at this location, what work would occur in the vicinity of this community if there would not be land conversion (permanent fill in wetlands)?

Can you clarify if habitat for meadow garlic and river birch will be impacted and if surveys will be completed before construction to determine impacts and develop mitigation measures? These two species are associated with the floodplain of the Spicket River and could occur outside of the documented exemplary swamp white oak floodplain forest.

Perhaps a plan sheet showing impacts at this location would be helpful.

I will have minimal access to email except for mornings before 8 and after 5 p.m. but I hope we can touch base so as not to delay your permitting.

Thank you,
Amy

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OcmZjH4iEcrwlTx2TjVak1wTUcqov8M&s=HvKrKszzhtQbkQAgPXiLuimMjnKKhGEdMQ4K7LzvKaA&e=>>)

From: Degler, Jeremy <jdegler@vvhb.com<mailto:jdegler@vvhb.com>>
Date: Tuesday, Jul 17, 2018, 12:49 PM
To: Lamb, Amy <Amy.Lamb@dncr.nh.gov<mailto: Amy.Lamb@dncr.nh.gov>>
Subject: RE: Request for Review - NHB18-2079

Hi Amy -

I apologize for bothering you on this, but Pete Walker and I are up against a wall on this project, the DOT gave us an extremely accelerated schedule and they're hoping to have our NEPA re-evaluation by the end of this Friday.

Is there any way you could help us out on this one? It would be greatly appreciated.

Thanks, and let me know if there's any information I can provide that could help. I might be seeing you at the meeting tomorrow morning regarding this project!

Jeremy Degler, PWS
Environmental Scientist

P 603.391.3867

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pbj1KgDOsA-4ZWSrvDXZoV2MmZ7SIgkg&s=6xZ2YHofqoX2iWtS0GOCOob2qj5porVU7knwOS03MPg&e=>

From: Degler, Jeremy
Sent: Friday, July 13, 2018 10:39 AM
To: 'Amy.Lamb@dncr.nh.gov' <Amy.Lamb@dncr.nh.gov>
Subject: Request for Review - NHB18-2079

Good morning Amy,

VHB is assisting the New Hampshire Department of Transportation ("Client") with a lane widening project of I-93 in southern New Hampshire from the New Hampshire - Massachusetts state line to Exit 1 . This project has previously been assessed via a 2004 FEIS and a 2010 SEIS, and we are currently in the process of completing a NEPA re-evaluation. The project involves the widening of I-93 from 3 to 4 lanes, entirely within the existing DOT right-of-way. No direct impacts (via fill or culvert) will occur within the Spicket River, Harris Brook, or Policy Brook.

The NHB report NHB18-2079 generated for the site indicated that a natural community and two plant species occur within the vicinity of the project site.

- * Swamp white oak floodplain forest
 - * No changes in the hydrology of the river or land conversion will occur which would impact this community. Any increase in nutrients and pollutants due to the increase in impervious surfaces will be moderated via stormwater controls such as detention basins. All wetland impacts will be mitigated.

- * Meadow garlic (*Allium canadense*)
 - * The habitat of this species (stream/riverbanks, forested swamps, low floodplain forest/moist thicket, wet meadows) will be avoided to the largest extent practicable when constructing this project. The majority of wetland impacts will occur within the existing cleared right-of-way where high quality wetland habitat typically is not located.

- * River birch
 - * No changes in the hydrology of this habitat will occur which would impact this species. Any increase in nutrients and pollutants due to the increase in impervious surfaces will be moderated via stormwater controls such as detention basins.

VHB respectfully requests any additional information or guidance from NHB regarding the avoidance and protection of the natural community and plant species for the NEPA re-evaluation of this project. Please feel free to contact me at any time if you require any additional information.

Much appreciated,

Jeremy Degler, PWS
Environmental Scientist

[cid:image001.gif@01D41DCC.9E5EBDD0]

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3A_www.vhb.com_d=DwMFAg&c=vYl7KJMDeuM7F-
Nqf_hfailBifPmyspo7hrJG1NN7nU&r=MyHGDyJeWa0X2vTvxBR49jnu_HHjCI7OWirpS7CIUnw&m=YrDoPIHm8pq
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Matras, Lindsay

From: Doperalski, Melissa <Melissa.Doperalski@wildlife.nh.gov>
Sent: Wednesday, November 14, 2018 3:59 PM
To: Matras, Lindsay
Cc: Walker, Peter; Martin, Benjamin; Tuttle, Kim; Degler, Jeremy
Subject: [External] RE: Request for Further Review - NHB18-2079
Attachments: NHF&G Letter_package.pdf; ContractA_FB_ENV_Wetland_Impacts_Mapbook_07182018.pdf; ContractA_FB_ENV_Wetland_Impacts_Mapbook_10122018.pdf; NHB18-2079_Degler.pdf

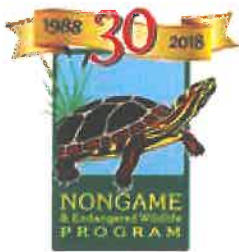
Hi Lindsay,

The NHFG has reviewed the materials provided (attached) that includes updated project information that indicates that direct impacts to water resources will be avoided with the exception of some impacts to the bed and bank and minor hydrological changes. Based on the information provided, NHFG does not have any additional comments at this time.

Thank you,
Melissa

Melissa Doperalski
Wildlife Diversity Biologist
Certified Wildlife Biologist
Nongame & Endangered Wildlife Program
NH Fish & Game Department
11 Hazen Drive
Concord NH 03301
Phone: 603-271-1738

<http://www.wildlife.state.nh.us/nongame/index.html>



Check out reptiles and amphibians of NH!

<http://www.wildlife.state.nh.us/nongame/reptiles-amphibians.html>

Report your sightings of reptiles and amphibians in 3 ways:

- 1) Email details of observation or completed form to RAARP@wildlife.nh.gov
- 2) Enter your observation online at <http://nhwildlifesightings.unh.edu>.
- 3) Mail your reporting slip <http://www.wildlife.state.nh.us/nongame/documents/raarp-report-form.pdf>

From: Matras, Lindsay [mailto:imatras@vhb.com]
Sent: Monday, October 22, 2018 10:41 AM

To: Doperalski, Melissa
Cc: Walker, Peter; Martin, Benjamin; Tuttle, Kim; Degler, Jeremy
Subject: FW: Request for Further Review - NHB18-2079
Importance: High

Hello Melissa,

We are looking to wrap up correspondence with NHF&G regarding rare species along the I-93 corridor in Salem – please see the below email and attached letter.

To assist you in your assessment of potential impacts, attached is a wetland impact map from July as well as the updated wetland map with call-outs indicating areas where wetland impacts have been reduced and areas where impacts have increased. Based on the latest design, impacts to the bed and bank of the Harris Brook Tributary have significantly decreased. **Some minor impact to the bed and bank of the tributary remain in two locations**, however all remaining wetland and stream impacts have been reduced by the use of guardrails along portions of the highway to allow for steeper slope lines to avoid impacts.

Please let me know if you have any concerns regarding the vertebrate species identified on the NHB report (also attached) at your earliest convenience. Feel free to give me a call to discuss if anything needs to be clarified.

Thank you!

Lindsay Matras
Environmental Scientist

P 603.391.3916
www.vhb.com

From: Degler, Jeremy
Sent: Monday, September 17, 2018 1:46 PM
To: Kim.Tuttle@wildlife.nh.gov
Cc: Walker, Peter <PWalker@VHB.com>; Martin, Benjamin <benjaminmartin@vhb.com>; Matras, Lindsay <lmatras@vhb.com>
Subject: Request for Further Review - NHB18-2079

Good afternoon Kim –

In July, we had discussed a project in which VHB is assisting the New Hampshire Department of Transportation with a lane widening project of I-93 from the New Hampshire – Massachusetts state line to Exit 1. Due to coordination with your agency and several others, changes have been made since that time in the proposed project in order to avoid impacts to critical species and habitat.

I've attached a packet including the updated information, VHB would like know if the NH Fish and Game Department concurs with our assessment that these changes avoid any effects to those resources listed in the original NHB Report (NHB18-2079). Please feel free to contact me at any time if you require any additional information.

Much appreciated,

Jeremy Degler
Environmental Scientist



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Degler, Jeremy

From: Tuttle, Kim <Kim.Tuttle@wildlife.nh.gov>
Sent: Thursday, July 19, 2018 9:01 AM
To: Degler, Jeremy
Cc: Doperalski, Melissa; Henderson, Carol; Magee, John
Subject: RE: [External] NHB18-2079 widening of I-93 from 3 to 4 lanes

Hi Jeremy,

There are some discrepancies in the job description such as in the original email "No direct impacts (via fill or culvert) will occur within the Spicket River, Harris Brook, or Policy Brook." and in the email immediately below "On page two, there's a portion where we show a proposed relocation of Harris Brook as part of a stormwater BMP, that is being re-evaluated after discussions with the DES Wetlands Bureau." We will also need specific distances from any proposed disturbance to the streams and types of wetland being impacted. Also, as several of the wetlands in the newest delineation report were identified as "potential vernal pools" but no vernal pool surveys have been completed, and no vernal pools were identified in the prior delineation reports, we are uncomfortable offering any comments at this time. Also, this has been an unusually dry spring and not ideal for vernal pool evaluation. I think we as an agency would feel more comfortable reading the results of the Aug. 1 agency and DOT site walk before supplying written comments.

Thank you,

Kim Tuttle
Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Degler, Jeremy [mailto:jdegler@vhb.com]
Sent: Wednesday, July 18, 2018 12:22 PM
To: Tuttle, Kim
Subject: RE: [External] NHB18-2079 widening of I-93 from 3 to 4 lanes

Hi Kim –

I've attached a map showing the project extents. On page two, there's a portion where we show a proposed relocation of Harris Brook as part of a stormwater BMP, that is being re-evaluated after discussions with the DES Wetlands Bureau.

Our closest point to the Spicket River is approximately 100 feet away from the bank. The edge of impacts will be very close to both Harris Brook and Policy brook, but any minor impacts will likely be avoided during the upcoming design process.

The 2017 delineation identified several wetlands which will be impacted, but total wetland impacts should be under 2,500 square feet. Several of the wetlands in the newest delineation report were identified as "potential vernal pools" but no vernal pool surveys have been completed, and no vernal pools were identified in the prior delineation reports.

Jeremy Degler, PWS

Environmental Scientist

P 603.391.3867
www.vhb.com

From: Tuttle, Kim [mailto:Kim.Tuttle@wildlife.nh.gov]
Sent: Wednesday, July 18, 2018 10:53 AM
To: Degler, Jeremy <jdegler@vhb.com>
Cc: Doperalski, Melissa <Melissa.Doperalski@wildlife.nh.gov>; Magee, John <john.magee@wildlife.nh.gov>
Subject: [External] NHB18-2079 widening of I-93 from 3 to 4 lanes

Jeremy,

Could you let us know if any vernal pools or wetlands will be impacted as part of this project so that we may determine potential impacts to spotted turtle? How close will you be to the Spicket River, Harris Brook, or Policy Brook at the nearest point?

Thanks,

Kim Tuttle
Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Degler, Jeremy [mailto:jdegler@vhb.com]
Sent: Friday, July 13, 2018 10:57 AM
To: Tuttle, Kim
Subject: Request for Review - NHB18-2079

Good morning Kim,

VHB is assisting the New Hampshire Department of Transportation ("Client") with a lane widening project of I-93 in southern New Hampshire from the New Hampshire – Massachusetts state line to Exit 1 . This project has previously been assessed via a 2004 FEIS and a 2010 SEIS, and we are currently in the process of completing a NEPA re-evaluation. The project involves the widening of I-93 from 3 to 4 lanes, entirely within the existing DOT right-of-way. No direct impacts (via fill or culvert) will occur within the Spicket River, Harris Brook, or Policy Brook. The NHB report NHB18-2079 generated for the site indicated that three vertebrate species occur within the vicinity of the project site.

- American eel (*Anguilla rostrata*)
- Redfin pickerel (*Esox americanus*)
- Spotted turtle (*Clemmys guttata*)

VHB would like know if the NH Fish and Game has any concerns regarding the effects the project may have on these species. Please feel free to contact me at any time if you require any additional information.

Much appreciated,

Jeremy Degler, PWS
Environmental Scientist



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Appendix E – USFWS IPaC Results



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:

July 03, 2018

Consultation Code: 05E1NE00-2018-SLI-2273

Event Code: 05E1NE00-2018-E-05315

Project Name: I-93 Lane Widening

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2018-SLI-2273

Event Code: 05E1NE00-2018-E-05315

Project Name: I-93 Lane Widening

Project Type: TRANSPORTATION

Project Description: Widening I-93 from 3 to 4 lanes between the state line and exit 1.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/42.75273907074731N71.21992459715653W>



Counties: Essex, MA | Rockingham, NH

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix F – USFWS Correspondence



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:

July 20, 2018

Consultation Code: 05E1NE00-2018-I-2273

Event Code: 05E1NE00-2018-E-05716

Project Name: Salem-Manchester, 10418C, I-93 Widening - Contract 13933A

Subject: Concurrence verification letter for the 'Salem-Manchester, 10418C, I-93 Widening - Contract 13933A' project under the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated to verify that the **Salem-Manchester, 10418C, I-93 Widening - Contract 13933A** (Proposed Action) may rely on the concurrence provided in the February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action is within the scope and adheres to the criteria of the PBO, including the adoption of applicable avoidance and minimization measures, may affect, but is not likely to adversely affect (NLAA) the endangered Indiana bat (*Myotis sodalis*) and/or the threatened Northern long-eared bat (*Myotis septentrionalis*).

The Service has 14 calendar days to notify the lead Federal action agency or designated non-federal representative if we determine that the Proposed Action does not meet the criteria for a NLAA determination under the PBO. If we do not notify the lead Federal action agency or designated non-federal representative within that timeframe, you may proceed with the Proposed Action under the terms of the NLAA concurrence provided in the PBO. This verification period allows Service Field Offices to apply local knowledge to implementation of the PBO, as we may identify a small subset of actions having impacts that were unanticipated. In such instances, Service Field Offices may request additional information that is necessary to verify inclusion of the proposed action under the PBO.

For Proposed Actions that include bridge/structure removal, replacement, and/or maintenance activities: If your initial bridge/structure assessments failed to detect Indiana bats, but you later detect bats during construction, please submit the Post Assessment Discovery of Bats at Bridge/Structure Form (User Guide Appendix E) to this Service Office. In these instances, potential incidental take of Indiana bats may be exempted provided that the take is reported to the Service.

If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or Northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA Section 7(a)(2) may be required. If the Proposed Action may affect any other federally-listed or proposed species, and/or any designated critical habitat, additional consultation is required. If the proposed action has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please contact this Service Office.

Project Description

The following project name and description was collected in IPaC as part of the endangered species review process.

Name

Salem-Manchester, 10418C, I-93 Widening - Contract 13933A

Description

Widening of I-93 from 3 to 4 lanes in Salem, New Hampshire from Exit 1 south to the Massachusetts state line.

Determination Key Result

Based on your answers provided, this project(s) may affect, but is not likely to adversely affect the endangered Indiana bat and/or the threatened Northern long-eared bat. Therefore, consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required. However, also based on your answers provided, this project may rely on the concurrence provided in the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

Qualification Interview

1. Is the project within the range of the Indiana bat^[1]?

[1] See [Indiana bat species profile](#)

Automatically answered

No

2. Is the project within the range of the Northern long-eared bat^[1]?

[1] See [Northern long-eared bat species profile](#)

Automatically answered

Yes

3. Which Federal Agency is the lead for the action?

A) Federal Highway Administration (FHWA)

4. Are *all* project activities limited to non-construction^[1] activities only? (examples of non-construction activities include: bridge/abandoned structure assessments, surveys, planning and technical studies, property inspections, and property sales)

[1] Construction refers to activities involving ground disturbance, percussive noise, and/or lighting.

No

5. Does the project include *any* activities that are **greater than** 300 feet from existing road/rail surfaces^[1]?

[1] Road surface is defined as the actively used [e.g. motorized vehicles] driving surface and shoulders [may be pavement, gravel, etc.] and rail surface is defined as the edge of the actively used rail ballast.

No

6. Does the project include *any* activities **within** 0.5 miles of an Indiana bat and/or NLEB hibernaculum^[1]?

[1] For the purpose of this consultation, a hibernaculum is a site, most often a cave or mine, where bats hibernate during the winter (see suitable habitat), but could also include bridges and structures if bats are found to be hibernating there during the winter.

No

7. Is the project located **within** a karst area?

No

8. Is there *any* suitable^[1] summer habitat for Indiana Bat or NLEB **within** the project action area^[2]? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

[2] The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR Section 402.02). Further clarification is provided by the [national consultation FAQs](#).

Yes

9. Will the project remove *any* suitable summer habitat^[1] and/or remove/trim any existing trees **within** suitable summer habitat?

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

Yes

10. Will the project clear more than 20 acres of suitable habitat per 5-mile section of road/rail?

No

11. Have presence/probable absence (P/A) summer surveys^{[1][2]} been conducted^{[3][4]} **within** the suitable habitat located within your project action area?

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

[2] Presence/probable absence summer surveys conducted within the fall swarming/spring emergence home range of a documented Indiana bat hibernaculum (contact local Service Field Office for appropriate distance from hibernacula) that result in a negative finding requires additional consultation with the local Service Field Office to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

[3] For projects within the range of either the Indiana bat or NLEB in which suitable habitat is present, and no bat surveys have been conducted, the transportation agency will assume presence of the appropriate species. This assumption of presence should be based upon the presence of suitable habitat and the capability of bats to occupy it because of their mobility.

[4] Negative presence/probable absence survey results obtained using the [summer survey guidance](#) are valid for a minimum of two years from the completion of the survey unless new information (e.g., other nearby surveys) suggest otherwise.

Yes

SUBMITTED DOCUMENTS

- *Acoustic Survey 082917 Email to FWS.PDF* <https://ecos.fws.gov/ipac/project/M7C6AB6QOZCLTATZGVQOYXEELE/projectDocuments/13246827>
- *13933AUSFWSR5BatReportingFormRevisedMay2017.xlsx* <https://ecos.fws.gov/ipac/project/M7C6AB6QOZCLTATZGVQOYXEELE/projectDocuments/13246832>

12. Did the presence/probable absence (P/A) summer surveys detect Indiana bats and/or NLEB^[1]?

[1] P/A summer surveys conducted within the fall swarming/spring emergence home range of a documented Indiana bat hibernaculum (contact local Service Field Office for appropriate home range) that result in a negative finding requires additional consultation with the local Service Field Office to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

No

13. Were the P/A summer surveys conducted **within** the fall swarming/spring emergence range of a documented Indiana bat hibernaculum^[1]?

[1] Contact the local Service Field Office for appropriate distance from hibernacula.

No

14. Does the project include activities **within documented NLEB habitat**^{[1][2]}?

[1] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry triangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

[2] For the purposes of this key, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) treed corridors located directly between documented roosting and foraging habitat.

No

15. Will the removal or trimming of habitat or trees occur **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors?

Yes

16. What time of year will the removal or trimming of habitat or trees **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors occur?

C) During both the active and inactive seasons

17. Will *any* tree trimming or removal occur **within** 100 feet of existing road/rail surfaces?

Yes

18. Will **more than** 10 trees be removed **between** 0-100 feet of the road/rail surface *during* the active season^[1]?

[1] Areas containing more than 10 trees will be assessed by the local Service Field Office on a case-by-case basis with the project proponent.

Yes

19. Will the tree removal alter *any* **documented** Indiana bat or NLEB roosts and/or alter any surrounding summer habitat **within** 0.25 mile of a documented roost?

No

20. Will *any* tree trimming or removal occur **between** 100-300 feet of existing road/rail surfaces?
Yes
21. Are *all* trees that are being removed clearly demarcated?
Yes
22. Will the removal of habitat or the removal/trimming of trees involve the use of **temporary** lighting?
No
23. Will the removal of habitat or the removal/trimming of trees include installing new or replacing existing **permanent** lighting?
No
24. Does the project include maintenance of the surrounding landscape at existing facilities (e.g., rest areas, stormwater detention basins)?
No
25. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?
No
26. Does the project include slash pile burning?
No
27. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?
No
28. Does the project include the removal, replacement, and/or maintenance of *any* structure other than a bridge? (e.g., rest areas, offices, sheds, outbuildings, barns, parking garages, etc.)
No
29. Will the project involve the use of **temporary** lighting *during* the active season?
No
30. Will the project install new or replace existing **permanent** lighting?
No
-

31. Does the project include percussives or other activities (**not including tree removal/trimming or bridge/structure work**) that will increase noise levels above existing traffic/background levels?

No

32. Are *all* project activities that are **not associated with** habitat removal, tree removal/trimming, bridge or structure removal, replacement, and/or maintenance, lighting, or use of percussives, limited to actions that DO NOT cause any stressors to the bat species, including as described in the BA/BO (i.e. activities that do not involve ground disturbance, percussive noise, temporary or permanent lighting, tree removal/trimming, nor bridge/structure activities)?

Examples: lining roadways, unlighted signage, rail road crossing signals, signal lighting, and minor road repair such as asphalt fill of potholes, etc.

Yes

33. Will the project raise the road profile **above the tree canopy**?

No

34. Are the project activities that are not associated with habitat removal, tree removal/trimming, bridge removal, replacement, and/or maintenance, structure removal, replacement, and/or maintenance, and lighting, consistent with a No Effect determination in this key?

Automatically answered

Yes, other project activities are limited to actions that DO NOT cause any stressors to the bat species as described in the BA/BO

35. Is the location of this project consistent with a Not Likely to Adversely Affect determination in this key?

Automatically answered

Yes, because no bats were detected during presence/probable absence surveys conducted during the summer survey season and outside of the fall swarming/spring emergence periods. Additionally, all activities were at least 0.5 miles from any hibernaculum.

36. **General AMM 1**

Will the project ensure *all* operators, employees, and contractors working in areas of known or presumed bat habitat are aware of *all* FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable Avoidance and Minimization Measures?

Yes

Project Questionnaire

1. Have you made a No Effect determination for *all* other species indicated on the FWS IPaC generated species list?

Yes

2. Have you made a May Affect determination for *any* other species on the FWS IPaC generated species list?

No

3. How many acres^[1] of trees are proposed for removal between 0-100 feet of the existing road/rail surface?

[1] If described as number of trees, multiply by 0.09 to convert to acreage and enter that number.

3.12

4. How many acres^[1] of trees are proposed for removal between 100-300 feet of the existing road/rail surface?

[1] If described as number of trees, multiply by 0.09 to convert to acreage and enter that number.

0

Avoidance And Minimization Measures (AMMs)

These measures **were accepted** as part of this determination key result:

GENERAL AMM 1

Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable AMMs.

Determination Key Description: FHWA, FRA, FTA Programmatic Consultation For Transportation Projects Affecting NLEB Or Indiana Bat

This key was last updated in IPaC on March 16, 2018. Keys are subject to periodic revision.

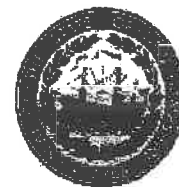
This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) for the endangered **Indiana bat** (*Myotis sodalis*) and the threatened **Northern long-eared bat** (NLEB) (*Myotis septentrionalis*).

This decision key should only be used to verify project applicability with the Service's [February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects](#). The programmatic biological opinion covers limited transportation activities that may affect either bat species, and addresses situations that are both likely and not likely to adversely affect either bat species. This decision key will assist in identifying the effect of a specific project/activity and applicability of the programmatic consultation. The programmatic biological opinion is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic biological opinion, or that may affect ESA-listed species other than the Indiana bat or NLEB, or any designated critical habitat, may require additional ESA Section 7 consultation.

Appendix G – Section 106 Consultation Documents



THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION



GEORGE N. CAMPBELL, JR.
COMMISSIONER

JEFF BRILLHART, P.E.
ASSISTANT COMMISSIONER

Salem-Manchester
IM-IR-93-1(174) 0
10418C
Page 1

Effect Memo: Update

Pursuant to meetings and discussions on January 13, 2005; April 13, November 2, May 4, and October 5, 2006; May 3 and 10, July 12, August 9, and December 6, 2007; January 10, February 7, March 13, April 3, May 8, and November 13, 2008; and February 12, 2009, and for the purpose of compliance with regulations of the National Historic Preservation Act, as amended, and the Advisory Council on Historic Preservation's *Procedures for the Protection of Historic Properties* (36 CFR 800), the NH Division of Historical Resources and the NH Division of the Federal Highway Administration have coordinated the identification and evaluation of historic and archaeological properties with plans to reconstruct Interstate 93 between the Massachusetts border to Interstate 293 in the towns of Salem, Windham, Derry, and Londonderry, and the City of Manchester, New Hampshire.

This memo represents an update to portions of the Adverse Effect Memo and Memorandum of Agreement (MOA) signed on August 8, 2002 and February 5, 2004 respectively, concerning:

- (1) the George and Robert Armstrong properties (WND0085 and WND0086 respectively) in the Town of Windham, New Hampshire;
- (2) an impact to the dwelling at 2 Brady Street (SAL0224) in the Town of Salem, which, after the original Section 106 review and completion of the I-932004 FEIS, was eventually acquired as part of the project evaluated and determined to be eligible as a contributing part of the Armenian Settlement District Area; and
- (3) the unanticipated impact to two stone culverts located on the Manchester and Lawrence Railroad at Exit 5 in Londonderry where NH Route 28 intersects I-93. The "brick-topped" culvert is located under the Manchester and Lawrence Railroad corridor west of the Exit 5 southbound off-ramp of I-93 and the second stone culvert with stone lintel top is located at Independence Drive east of Exit 5 of I-93 and Auburn Road.

(1) Based on a review pursuant to 36 CFR 800.4 of the historical and architectural significance of identified resources, it was agreed that the George and Robert Armstrong properties are individually eligible for the National Register of Historic Places. Applying the criteria of effect at 800.5, it was determined that the project alternatives had an adverse effect on these two properties. The effect included total property acquisition with building relocation for the Robert Armstrong House and building removal for the George Armstrong House.

In summary, under the stipulations of the MOA signed on February 5, 2004, the signatories agreed to the following mitigation. After the purchase of the Robert Armstrong House, the NH Department of Transportation (NH DOT) agreed to: documentation at the level of the NH Historic Property Documentation Form; a structural study of the dwelling for relocation; the dwelling's

relocation as close to its current location as practicable; and conveyance to a new owner with protective covenants. After the purchase of the George Armstrong House, the NHDOT agreed to its documentation at the level of the NH Historic Property Documentation Form. The NHDOT would re-convey the dwelling to the owner with protective covenants for relocation or, if the owner declines, market the building to the public for relocation with protective covenants if feasible.

Because the NHDOT has avoided the two dwellings since the MOA was signed by shifting both proposed barrels of I-93 and modifying the slopes, purchase of the two properties was unnecessary. The NHDOT has initiated documentation of both properties as specified. As part of the settlement agreement with the property owner, the NHDOT has stabilized the Robert Armstrong House. The owner signed protective easements for the rehabilitation of this property. Additionally, all but the barn/workshop addition to the George Armstrong House will remain standing. In both cases, the Secretary of the Interior Standards have been or will be followed.

(2) Based on a review pursuant to 36 CFR 800.4 of the historical and architectural significance of identified resources, it was agreed that the Henry Vartanian Property at 2 Brady Street is a contributing property to the eligible Armenian Settlement District Area. Applying the criteria of effect at 800.5, it was determined on April 13, 2006 that the Selected Alternative identified in the I-93 Project's 2005 ROD resulted in an adverse effect to the property. The effect to the property and district included a total property acquisition with building removal.

It is agreed that mitigation for this taking includes the completion of a NH Historic Property Documentation Form with large format, archivally stable negatives and contact prints; floor plans of the dwelling; and narrative detailing the property description, history, context, significance, and integrity. Additional mitigation includes the expansion of the district area form for the Armenian Settlement District and the installation of a state historic marker recognizing the significance of the community. The marker will be placed in the vicinity of the Armenian Congregation Church.

(3) Based on a review pursuant to 36 CFR 800.4 of the historical and architectural significance of identified resources, it was agreed on May 8, 2008 that the brick-top stone box culvert under the Manchester and Lawrence Railroad corridor is individually eligible for the National Register of Historic Places. It was agreed on November 13, 2008, that the stone culvert under the same line at Independence Drive would be treated as if it is individually eligible for the National Register. Applying the criteria of effect at 800.5, it was determined that the project results in a no adverse effect on the brick-top culvert. However, because of the impact, the project will have an adverse effect on the Independence Drive stone culvert. Here, an 18" pipe will be placed within the existing stone culvert, flowable fill will occupy the voids, and a new headwall will be placed at the end of the pipe since it will be extended to the south of the existing headwall. It may be necessary to remove the lintels to insert the pipe. The existing stone box culvert will then be buried under the relocated Independence Drive.

It is agreed that the NHDOT will document the culverts and other cultural resources along the Manchester and Lawrence Railroad in New Hampshire on a district area form to determine the eligibility of the line.

Treatment of the brick-top culvert will include the relocation of an underground telephone cable using directional boring rather than trenching. The NHDOT will protect the culvert and its immediately associated railroad corridor with orange construction fencing during the multiple phases of construction in the vicinity of the culvert. The Bureau of Environment will discuss the location of the fencing with the construction contractor at a pre-construction meeting and will delineate the location in the field. Additionally, heavy machinery will not cross the culvert, and the corridor will be restored over the culvert following construction.

Treatment of the Independence Drive stone culvert will include its documentation through a brief NH Historic Property Documentation Form. The form will include large format photographs, a sketch of the elevation of the culvert, a design plan, and narrative description and statement of historical background, context, and significance. If excavation during construction reaches the top or sides of the culvert so they are visible, the NHDOT will also monitor the soil removal to ascertain whether Scottish stone quarry marks are visible on other stone faces as they are accessible to view.

In accordance with the Advisory Council's regulations, consultation will continue, as appropriate, as this project proceeds.

Liida Ray Wilson DSHPO for
Elizabeth Muzzey,
State Historic Preservation Officer

Kathleen O. Laffey
Kathleen O. Laffey, Administrator
Federal Highway Administration

Concurred with by the New Hampshire Department of Transportation:

Date: July 16, 2009

Joyce McKay
Joyce McKay,
Cultural Resources Manager

c.c. Jamie Sikora, FHWA
Beth Muzzey, NHDHR

Peter Stamnas, NHDOT
Marc Laurin, NHDOT

FIRST AMENDED MEMORANDUM OF AGREEMENT
AMONG NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION,
FEDERAL HIGHWAY ADMINISTRATION,
and the
NEW HAMPSHIRE STATE HISTORIC PRESERVATION OFFICER

Regarding the Salem to Manchester Interstate 93 widening project.

WHEREAS, the Federal Highway Administration (FHWA) plans to provide funds for the New Hampshire Department of Transportation (NHDOT) to improve and widen the I-93 corridor between Salem and Manchester; and

WHEREAS, FHWA has determined that the undertaking will have an adverse effect on the following properties that are eligible for listing in the National Register of Historic Places:

George F. Armstrong House (WND0085), 86 Range Road, Windham,
Robert Armstrong House (WND0086), 88 Range Road, Windham,
Robert J. Prowse Memorial Bridge (LON0116), Ash Street over I-93, Londonderry,
Gearty House (LON0105), 117 Rockingham Road, Londonderry,
Stone walls associated with Searles Castle (WND-D1), off NH Route 111, Windham,
Henry Vartanian House, 2 Brady Street (SAL0224), Salem,
Armenian Settlement Historic District, Salem,
Brick-topped stone culvert under the Manchester & Lawrence Railroad, west of Exit 5, Londonderry, and
Stone culvert under the Manchester & Lawrence Railroad, adjacent to Independence Drive, Londonderry

and has consulted with the NHDOT and the New Hampshire State Historic Preservation Officer (SHPO) pursuant to 36 C.F.R. part 800, of the regulations implementing Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108); and

WHEREAS, NHDOT has reached out to the various and other interested groups via letters and at the Public Informational Meeting and the Public Hearing to seek Consulting Party status; the Windham Historic District Commission has been identified as a Consulting Parties; and

WHEREAS, in accordance with 36 C.F.R. § 800.6(a)(1), FHWA has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect determination with specified documentation and the ACHP has chosen not to participate in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii).

WHEREAS, the FHWA, NHDOT and the SHPO executed a Memorandum of Agreement (Original MOA) signed February 5, 2004 taking into account the adverse effects on the project; and

WHEREAS, Stipulations II, IV, and V in the Original MOA concerning the acquisition, relocation and marketing of the George F. Armstrong House and the Robert Armstrong House, shall be deleted due to updated project plans that no longer impacted those properties; and

WHEREAS, Stipulation VIII, concerning the Robert Prowse Bridge, in the Original MOA shall be amended to accommodate updated project plans; and

WHEREAS, Stipulation X, concerning archaeological resources, in the Original MOA shall be amended to accommodate updated project plans; and

WHEREAS, the same signatories that executed the Original MOA have agreed that an amendment to the memorandum of agreement should be executed; and

WHEREAS, the duration of the MOA shall be extended to the date stipulated in Section I of this amendment;

NOW, THEREFORE, FHWA, NHDOT and the SHPO agree that, upon submission of a copy of this executed amended MOA, as well as the documentation specified in 36 C.F.R Section 800.11 (e) and (f) to the ACHP, FHWA shall ensure that the Original MOA dated February 2004 is amended by deleting all of its stipulations and replacing them with the following in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

FHWA/NHDOT/SHPO agree that the following stipulations have been completed and warrant no further mitigative actions:

1. Minimization of Impact through design
 - a. Impacts to the Gearty House (LON0105) were minimized by choosing an alternative that avoided unnecessary slope impacts.
 - b. A brick top culvert along the Manchester-Lawrence railroad was protected with fencing during construction
 - c. Stabilization occurred on the Robert Armstrong House and a preservation easement was signed on the building.
 - d. The barn/workshop addition on the George Armstrong House was removed in an effort to preserve the remaining structure.
 - e. A state historic marker was installed in Salem discussing the importance of the Armenian Settlement Historic District.
2. Recordation has been completed on the following properties and all have been accepted by SHPO:
 - a. Robert Armstrong House, New Hampshire Historic Property Documentation (NHHPD), NH State No. 604
 - b. George F. Armstrong House, NHHPD, NH State No. 605
 - c. Robert Prowse Bridge, Ash Street, Londonderry, NHHPD, NH State No. 650
 - d. Henry Vartanian House, NHHPD, NH State No. 613
 - e. Manchester-Lawrence Railroad Culvert MM 19.23, Independence Drive, Londonderry, NHHPD, NH State No. 654
 - f. The Manchester-Lawrence railroad was recorded in a Historic District Area form
 - g. The Indian Rock Road wall fragment, associated with Searles Castle was recorded on an Individual

Inventory Form (WND0008). No additional stone walls associated with Searles Castle were identified.

3. Wetland Mitigation Site: All of the wetland mitigation sites for the project have been completed. No additional archaeological resources were identified.

FHWA/NHDOT shall ensure that the following measures are carried out:

4. Mitigation of the Robert Prowse Bridge (LON0116)
 - a. The NHDOT will replace the bridge with a two-span steel stringer bridge with the girders haunched over the pier. This design is similar to the look and feel of the historic Ash Street Bridge.
 - b. NHDOT will make a concerted effort to find an adaptive reuse for the bridge. In 2015 it was determined feasible to remove the structure in a manner so as not to impact the character defining features of the bridge.
 - i. Because of the national significance of the bridge, it will be carefully dismantled and stored on NHDOT property, for a period not to exceed ten (10) years while NHDOT actively seeks for its relocation.
 - ii. NHDOT will offer the bridge for reuse in accordance with 23 USC Section 144. NHDOT will develop a marketing plan which will seek to market the bridge for relocation yearly, up to 10 years. This will include advertising on the NHDOT website, local and regional newspapers, and national preservation publications. Specific attention will be made to target municipalities, recreation trails and railroads. Ownership transfer for the re-use of the bridge will require the use of restrictive preservation and maintenance covenants lasting for 20 years to ensure protection of the character-defining features of the bridge. Any applicants interested in the bridge will also have to submit a preservation plan, showing how they will meet the Secretary of the Interior's "Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings," and will assume all future legal and financial responsibilities for the bridge. Federal Aid highway funds will be made available for its removal and relocation up to the estimated cost of demolition, not to exceed the approved bid estimate.
 1. The marketing plan will be developed no later than December 30, 2016. A 45 day review period will be provided for the draft submittal to FHWA and SHPO.
 - iii. If NHDOT cannot find an adaptive reuse in 10 years the bridge will be disposed of.
 - iv. Should the bid amount for this construction contract item vary by more than 25% from the engineering estimate, the Signatories will meet to discuss whether possible modifications to the proposed action may be necessary in order to better align the current scope to carefully dismantle, store and market the bridge with available funding.
 - c. NHDOT will create and install an interpretive exhibit about its design and fabrication. The location of the installation will be determined in consultation with NHDOT and its consultant, SHPO, and FHWA. NHDOT and SHPO will have a 45 day minimum to review a draft product prior to installation.
5. Archaeological Investigations
 - a. All Phase II archaeological investigations have been completed. If project plans change and additional archaeological investigation is necessary, extended Phase II or Phase III investigations

- will occur as needed.
- b. Final reports of the Phase II investigations, and any additional work, will be submitted to NHDOT for review. NHDOT will have 30 days to review and comment. Any revisions will be incorporated and final drafts will be submitted to SHPO for their 30 day review period.
 - i. Finalization of reports will include reviewing, and if necessary correcting, the site names to match those in the SHPO archaeological site database.
 - c. Additional mitigation, specifically public education, for the impacts on archaeological sites, if any, will be discussed and determined between FHWA, NHDOT and SHPO.
 - d. If human remains and grave-associated artifacts are discovered while carrying out the activities pursuant to this MOA, the FHWA and NHDOT will immediately notify the appropriate authorities, as prescribed by New Hampshire statutes, and the SHPO, to determine an appropriate course of action in accordance with RSA 277-C:8a-8j and the ACHP's "Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects," adopted by ACHP on February 23, 2007.
6. Protection of Historic Properties – The NHDOT shall ensure that any historic properties and/or archaeological sites, are secured and protected against damage, unauthorized occupancy, and vandalism until the measures stated in this agreement are implemented.

I. DURATION

This MOA amendment will expire if its terms are not carried out on December 31, 2022. Prior to such time, FHWA may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with Stipulation IV below.

II. MONITORING AND REPORTING

Each year following the execution of this MOA amendment until it expires, is terminated or stipulations completed, NHDOT shall provide all parties to this MOA amendment a summary report detailing work undertaken pursuant to its terms. Such report shall include the status outcome of the bridge marketing, any adaptive reuse possibilities, any scheduling changes proposed, any problems encountered, and any disputes and objections received in FHWA's efforts to carry out the terms of this MOA amendment.

III. DISPUTE RESOLUTION

Should any signatory to this MOA amendment object at any time to any actions proposed or the manner in which the terms of this MOA amendment are implemented, FHWA shall consult with such party to resolve the objection. If the FHWA determines that such objection cannot be resolved, FHWA will:

- A. Forward all documentation relevant to the dispute, including FHWA's proposed resolution, to the ACHP. The ACHP shall provide FHWA with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, FHWA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and

concurring parties, and provide them with a copy of this written response. FHWA will then proceed according to its final decision.

- B. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, FHWA may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, FHWA shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA amendment, and provide them and the ACHP with a copy of such written response.
- C. FHWA's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

IV. AMENDMENTS

This MOA amendment may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

V. TERMINATION

If any signatory to this MOA amendment determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation IV, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA amendment upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, FHWA must either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. FHWA shall notify the signatories as to the course of action it will pursue.

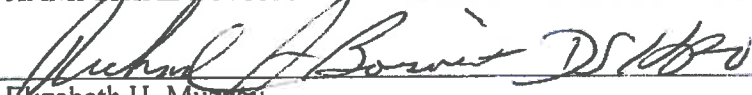
Execution of this MOA amendment by FHWA, NHDOT and SHPO and implementation of its terms evidence that FHWA has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

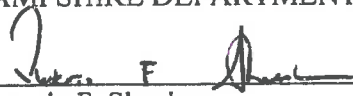
FEDERAL HIGHWAY ADMINISTRATION

By:  Date: 09/13/2016
for Patrick A. Bauer
NH Division Administrator

NEW HAMPSHIRE DIVISION OF HISTORICAL RESOURCES

By:  Date: 9-8-16
for Elizabeth H. Muzzey
State Historic Preservation Officer

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

By:  Date: 9/12/16
Victoria F. Sheehan
Commissioner

Please mail 2 copies of the completed form and required material to:

Cultural Resources Staff
Bureau of Environment
NH Department of Transportation
7 Hazen Drive
Concord, NH 03302

RECEIVED
AUG 03 2018

DHR Use Only	
R&C #	9954
Log In Date	___/___/___
Response Date	___/___/___
Sent Date	___/___/___

**Request for Project Review by the
New Hampshire Division of Historical Resources**
for Transportation Projects

RECEIVED
AUG 23 2018

VHB

- This is a new submittal.
- This is additional information relating to DHR Review and Compliance (R&C)#:

GENERAL PROJECT INFORMATION

DOT Project Name & Number Salem-Manchester 13933A

Brief Descriptive Project Title I-93 - 4th Lane Expansion from Stateline through Exit 1

Project Location I-93 from New Hampshire - Massachusetts State Line to Exit 1

City/Town Salem

Lead Federal Agency and Contact (if applicable) Federal Highway Administration (FHWA)
(Agency providing funds, licenses, or permits) Permit Type and Permit or Job Reference # A004(435)

DOT Environmental Manager (if applicable) Marc Laurin

PROJECT SPONSOR INFORMATION

Project Sponsor Name NH Department of Transportation

Mailing Address PO Box 483 Phone Number 603-271-4044

City Concord State NH Zip 03302 Email

CONTACT PERSON TO RECEIVE RESPONSE

Name/Company Wendy Johnson, PE / NHDOT

Mailing Address PO Box 483 Phone Number 603-391-3942

City Concord State NH Zip 03302 Email Wendy.Johnson@dot.nh.gov

This form is updated periodically. Please download the current form at <http://www.nh.gov/nhdhr/review>. Please refer to the Request for Project Review for Transportation Projects Instructions for direction on completing this form. Submit 2 copies of this project review form for each project for which review is requested. Include 1 self-addressed stamped envelope to expedite review response. Project submissions will not be accepted via facsimile or e-mail. This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and supporting documentation submitted with a review request, including photographs and publications, will be retained by the DOT and the DHR as part of its review records. Items to be kept confidential should be clearly identified. For questions regarding the DHR review process and the DHR's role in it, please visit our website at: <http://www.nh.gov/nhdhr/review> or contact the R&C Specialist at christina.st.louis@nh.gov or 603.271.3558.

Project Boundaries and Description

- Attach the relevant portion of a 7.5' USGS Map (photocopied or computer-generated) **indicating the proposed area of potential effect (APE)**. (See RPR for Transportation Projects Instructions and R&C FAQs for guidance. Note that the APE is subject to approval by lead federal agency and SHPO.)
- Attach a detailed narrative description of the proposed project.
- Attach current engineering plans with tax parcel, landscape, and building references, and areas of proposed excavation, if available.
- Attach photos of the project area/APE with mapped photo key (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) (Blank photo logs are available on the DHR website. Informative photo captions can be used in place of a photo log.)
- A DHR file review must be conducted to identify properties within or adjacent to the APE. Provide file review results in **Table 1**. (Blank table forms are available on the DHR website.)
File review conducted on 07/10/2018.*

*The DHR recommends that all survey/National Register nomination forms and their Determination of Eligibility (green) sheets are copied for your use in project development.

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts or landscapes within the APE? Yes No
If no, skip to Archaeology section. If yes, submit all of the following information:

- Attach completed **Table 2**.
- Photographs of **each** resource or streetscape located within the APE. Add to the mapped photo key and photo log noted above. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)
- Copies of National Register boundary (listed or eligible) mapping, and add National Register boundaries for listed and eligible properties to the 7.5' USGS project map (if applicable).

Archaeology

Does the proposed undertaking involve ground-disturbing activity? Yes No
If yes, submit all of the following information:

- Description of current and previous land use and disturbances.
- Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

Please note that for many projects an architectural and/or archaeological survey or other additional information may be needed to complete the Section 106 process.

AGENCY COMMENT

This Space for DOT and Division of Historical Resources Use Only

Sent to DHR; Authorized DOT Signature: VE Date: 8/2/2018

- Insufficient information to initiate review.
- Additional information is needed in order to complete review.

Comments: NO ARCHAEOLOGICAL CONCERNS AS PROPOSED PROJECT AREA REMAINS IN EXISTING DOT ROW WHICH HAS BEEN PREVIOUSLY SURVEYED AND DETERMINED TO EXHIBIT LOW OR NO ARCHAEOLOGICAL SENSITIVITY.

Above-ground-Preparation of historic district area form is recommended for the Haigh Avenue Area; and the "Mac" Subdivision area depending on potential impacts in the vicinity. Individual inventory of the 8 identified houses is recommended if potential impacts are anticipated.

If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation.

Authorized DHR Signature: Laura Black Date: Aug 20, 2018

Appendix H – Representative Site Photos

APPENDIX A. Wetland Photographs



Photo 1. Wetland N-1 is a riparian wetland associated with the Spickett River.



Photo 2. Wetland N-2 contains an oxbow of the Spickett River.



Photo 3. The inlet/outlet of Wetland N-2 to the Spickett River.



Photo 4. Wetland N-3 is a riparian wetland associated with the Spickett River.



Photo 5. Wetland N-4 is a potential vernal pool.



Photo 6. Wetland N-5 is a riparian system associated with Policy Brook.



Photo 7. Wetland N-6 is a stormwater retention pond.



Photo 8. Wetland N-7 is a stormwater retention pond.



Photo 9. Wetland N-8 is a roadside ditch.



Photo 10. Wetland N-9 is forested wetland in-between I-93 and a residence.



Photo 11. Wetland N-10 is a riparian system associated with Porcupine Brook.



Photo 12. Wetland N-11 is a riparian system associated with Porcupine Brook.



Photo 13. Wetland N-12 is a riparian wetland associated with Porcupine Brook.



Photo 14. Wetland N-13 is a riparian wetland associated with Porcupine Brook.



Photo 15. Wetland N-14 is a riparian wetland associated with Porcupine Brook.



Photo 16. Wetland N-15 is a forested wetland near the rest area.



Photo 17. Wetland N-16 is a forested wetland near the rest area.



Photo 18. Wetland M-1 is forested wetland in the highway median.



Photo 19. Wetland M-2 is forested wetland in the highway median.



Photo 20. Wetland M-3 is forested wetland in the highway median.



Photo 21. Wetland M-4 is a constructed stormwater treatment wetland on the side of I-93.



Photo 22. Wetland M-5 is a constructed stormwater treatment wetland on the side of I-93.



Photo 23. Wetland M-6 is a roadside ditch.



Photo 24. Wetland M-7 is a constructed stormwater treatment wetland in the highway median.



Photo 25. Wetland M-8 is a retention pond.



Photo 26. Wetland M-9 is a constructed stormwater treatment wetland.



Photo 27. Wetland M-10 is a constructed stormwater treatment wetland.



Photo 28. Wetland M-11 is a roadside ditch.



Photo 29. The constructed emergent marsh portion of wetland M-12.



Photo 30. The natural forested portion of wetland M12.



Photo 31. Wetland M-13 is a roadside ditch.



Photo 32. Wetland S-1 is a riparian wetland associated with the Harris Brook tributary.



Photo 33. Wetland S-2 is a small forested wetland.



Photo 34. Wetland S-3 is a forested wetland which contains Stream S-S2.



Photo 35. Wetland S-4 is a forested wetland complex which extends beyond the survey area.



Photo 36. Wetland S-5 is a small forested wetland.



Photo 37. Wetland S-6 is a small forested wetland.



Photo 38. Wetland S-7 is a forested wetland connected to the Harris Brook tributary.



Photo 39. Wetland S-8 is a scrub-shrub wetland.



Photo 40. Wetland S-9 is a large forested wetland complex.



Photo 41. Wetland S-10 is a roadside ditch.



Photo 42. Wetland S12 is a stormwater treatment wetland.



Photo 43. Wetland S-15 is a stormwater treatment wetland.



Photo 44. Wetland S-16 stormwater treatment wetland.



Photo 45. Wetland S-17 is a forested wetland complex with potential vernal pools.



Photo 46. Wetland S-18 is a forested wetland complex with potential vernal pools.



Photo 47. Wetland S-20 is large wetland complex.



Photo 48. Wetland S-21 is a forested wetland complex.

APPENDIX B. Stream Photographs



Photo 49. Policy Brook (Stream N-S1) is channelized throughout much of the survey area.



Photo 50. Porcupine Brook (Stream N-S2) is dammed to form a pond, wetland N-17.



Photo 51. The Spickett River (Stream N-S3) from wetland N1.



Photo 52. The typical character of the Harris Brook tributary (Stream S-S1).



Photo 53. Typical character of streams S-S2 and S-S3.



Photo 54. Stream S-S4 traverses wetland S20.

Appendix I – Construction Sequence Narrative

Construction Sequence

1. All work shall be located within the State right-of-way (ROW) or existing and obtained easements.
2. The Contractor shall install any necessary temporary sediment and erosion control measures prior to construction.
3. The phases below will be followed for the northbound (NB) construction:
 - A. *Phase 1A*: One northbound lane will be dropped to make two through lanes. This phase can be concurrently constructed with Phase 5A (SB). During this phase, the median step box widening is constructed for approximately 400' from the state line north and includes cross highway drainage pipe installations. Phase 1A shall occur during off-peak times.
 - B. *Phase 1*: Three lanes of travel will be shifted to the east with a reduced 4' shoulder. This phase can be constructed concurrently with Phase 5 (SB). During this phase, the step box widening on the west side the NB barrel shall be constructed, as well as pavement work from Sta. 1000 + 00 to 1059+50.
 - C. *Phase 2*: Anticipated to run through the winter season. This phase can be constructed concurrently with Phase 6 (SB). During this phase, the NB embankment and soundwall shall be constructed to the east of the alignment from Sta. 1008+50 to the rest area off-ramp.
 - D. *Phase 3*: During this phase, step-box widening on the east side of the NB barrel shall be completed. This phase can be constructed concurrently with Phase 7 (SB). Final pavement overlay will be completed from the state line to the northern project limits.
 - E. *Phase 4*: Not used at this time.
4. The phases below will be followed for the southbound (SB) construction:
 - F. *Phase 5A*: One lane will be dropped to make two through lanes. This phase can be constructed concurrently with Phase 1A (NB). During this phase, the median step box widening shall be constructed for approximately 400' from near the state line, north. This phase shall occur during off-peak times.
 - G. *Phase 5*: Three travel lanes will be shifted to the west with reduced 4' shoulders. This phase can be constructed concurrently with Phase 1 (NB). During this phase, the step box widening on the east side the SB barrel shall be constructed, as well as pavement work from Sta. 3000+00 to 3027+00.
 - H. *Phase 6*: SB traffic will be shifted to the median side to construct the embankments on the west side of the SB barrel. This phase can be constructed concurrently with Phase 2 (NB). This phase is anticipated to run through the winter season.
 - I. *Phase 7A*: One lane will be dropped to make two through lanes. This phase shall occur during off-peak times. During this phase the shoulder step box widening shall be constructed for approximately 300' approximately from the state line north.
 - J. *Phase 7*: SB traffic will shift to the median side to construct the step box widening on the west side of the SB barrel. This phase can be constructed concurrently with the Phase 3 (NB). Final pavement overlay will be completed from the state line to the northern project limits.
5. Traffic control and temporary erosion control measures shall be removed after completion and acceptance of the work.

Appendix J – Floodplain Map

\\vhb\gis\proj\Bedford\52541.00_I-93 Final Design\Project\Wetlands_Permitting_Figures\Floodplain_Impacts_Mapbook.mxd



- Legend**
- Contract A Construction Footprint
 - Existing Right of Way
 - 100-Year Floodplain Edge (VHB Corrected)
 - State Boundary
 - Existing Easement
 - 100-Year Floodplain (VHB Corrected)
 - Floodplain Impact Area

**NHDOT I-93
Salem - Manchester 13933A
FHWA A004 (435)**



Salem, NH

**I-93 Contract A
Floodplain Impact Areas**

Page 1 of 3
Source: NHGRANIT, VHB

Note: This is a draft figure and data is subject to change





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- Legend**
- Contract A Construction Footprint
 - Existing Right of Way
 - 100-Year Floodplain Edge (VHB Corrected)
 - State Boundary
 - Existing Easement
 - 100-Year Floodplain (VHB Corrected)
 - Floodplain Impact Area

**NHDOT I-93
Salem - Manchester 13933A
FHWA A004 (435)**



Salem, NH

I-93 Contract A

Floodplain Impact Areas

Page 2 of 3

Source: NHGRANIT, VHB

Note: This is a draft figure
and data is subject to change





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- Legend**
- Contract A Construction Footprint
 - Existing Right of Way
 - 100-Year Floodplain Edge (VHB Corrected)
 - State Boundary
 - Existing Easement
 - 100-Year Floodplain (VHB Corrected)
 - Floodplain Impact Area

**NHDOT I-93
Salem - Manchester 13933A
FHWA A004 (435)**



Salem, NH

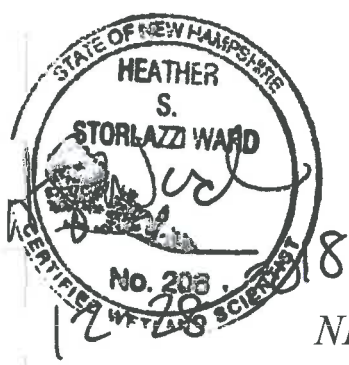
**I-93 Contract A
Floodplain Impact Areas**

Note: This is a draft figure and data is subject to change

Page 3 of 3
Source: NHGRANIT, VHB



Appendix K – Wetland and Stream Delineation and Functional Assessment Report



Wetland and Stream Delineation and Functional Assessment Report

NHDOT Salem-Manchester, Interstate Route 93 Project

Salem, New Hampshire



Prepared for:
NH Department Transportation
7 Hazen Drive
Concord, NH 03302



Prepared by:
FB Environmental Associates
170 West Road, Suite 6
Portsmouth, NH 03801



January 2018

*** Report & maps updated December 2018**

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Policy Brook.

Summary

A total of 55 palustrine wetlands were delineated within the survey area amounting to 24 forested systems, 29 emergent marshes, one scrub-shrub wetland and one impoundment with open water. Vernal pool assessment was not part of the scope of work for this project; however potential vernal pools were noted at eight locations within the survey area.

Seven streams and 16 scoured channels were also delineated. The Spickett River, Otter Brook, the Harris Brook tributary, and Porcupine Brook are lower perennial systems; the three remaining streams are small, intermittent tributaries. The majority of the delineated scoured channels connect culverts to streams or wetlands.

Nine species of non-native invasive species were observed throughout the survey area. Glossy false buckthorn (*Frangula alnus*) is prevalent throughout the entire project area.

1. Introduction

FB Environmental (FBE) was contracted by the New Hampshire Department of Transportation (NHDOT) to conduct wetland and stream delineations, wetland functional assessments, and invasive plant surveys along an approximately 2-mile stretch of the Interstate Route 93 corridor in the town of Salem, from Lowell Road southeast to the Massachusetts state line (Figure 1). FBE subcontracted with Chris Dorion of C.C. Dorion Geological Services, LLC and Heather Storlazzi Ward of Boyle Associates to complete the project. Wetland scientists from FBE and C.C. Dorion Geological Services, LLC assessed the survey area for the presence of jurisdictional wetlands, streams, and invasive plants. New Hampshire-certified Senior Wetland Scientist, Heather Storlazzi Ward conducted both field and office review of surveyed sites, including review of data forms, field notes, maps, and reports. Initial field work was conducted between June 27 and September 11, 2017. Follow-up verification was conducted during December 2018 during the absence of snow-covered ground.

2. Methods

Two, two-person survey teams, one led by Kevin Ryan and the other by Chris Dorion, conducted the wetland and stream delineations and invasive plant surveys. Kevin Ryan and Chris Dorion conducted the wetland functional assessments and completed Wetland Determination Data Forms.

2.1 Soils- Soil information for the survey area was obtained from the USDA-Natural Resources Conservation Service's Web Soil Survey and the Soil Survey of Rockingham County, New Hampshire (USDA Soil Conservation Service, 1994). We used the soil survey as a general guide and relied on site-specific hydric/non-hydric soil evaluations for the wetland delineation.

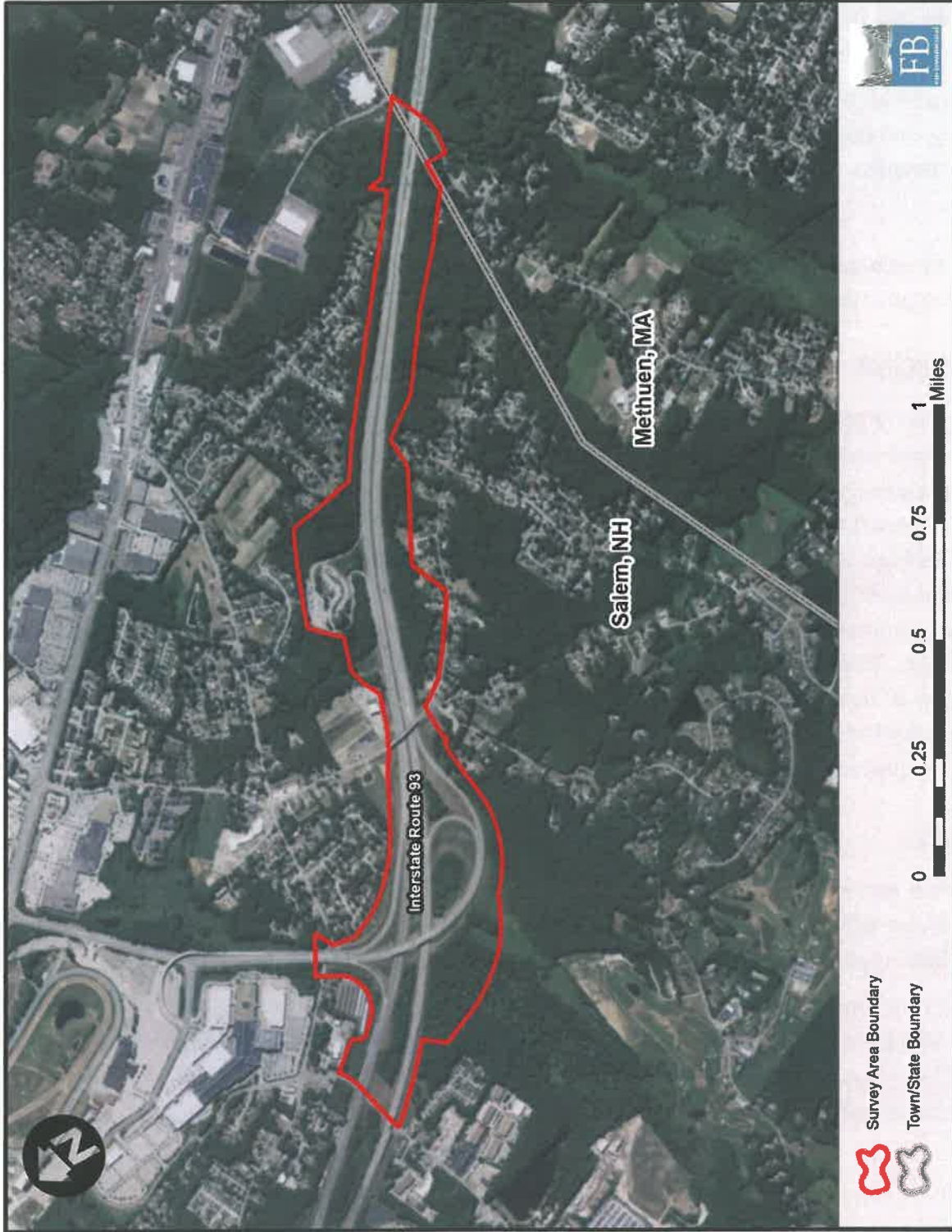


Figure 1. Project survey area – Interstate Route 93 in Salem, New Hampshire.

2.2 Wetland delineation- Based on current State and U.S. Army Corps of Engineers (USACE) policy for identifying jurisdictional wetlands, wetland delineations were performed following the protocols described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0, January, 2012* (USACE, 2012). Hydric soils were identified by applying criteria described in the *USDA Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 8.1, 2017*. The Routine Onsite

Determination Method was used for this project. This methodology involves identifying wetlands based on three criteria: the presence of hydrophytic vegetation, hydric soils, and hydrology. For a given area to be considered a wetland, all three of these parameters must be met, with some exceptions for disturbed areas.

Hydrophytic vegetation is defined as the community of macrophytes that occur in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence (USACE, 2012). An indicator status is assigned to each plant species; this is used to calculate the overall dominance of wetland plants in each stratum at each sample point. Based on the *2016 National Wetland Plant List* (Lichvar et al., 2016), the frequency of a plant species' occurrence in a wetland community determines the five categories of indicator status (Table 1).

Table 1. Qualitative description of the five wetland indicator status ratings used during wetland delineations, based on Lichvar et al. (2016).

Indicator	Status	Rating	Designation	Qualitative description
Obligate (OBL)			Hydrophyte	Almost always occurs in wetlands.
Facultative Wetland (FACW)			Hydrophyte	Usually occurs in wetlands, but may occur in non-wetlands.
Facultative (FAC)			Hydrophyte	Occurs in wetlands and non-wetlands.
Facultative Upland (FACU)			Non-hydrophyte	Usually occurs in non-wetlands, but may occur in wetlands.
Upland (UPL)			Non-hydrophyte	Almost never occurs in wetlands.

A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA Soil Conservation Service, 1994). Examples of hydric soil indicators include a histic epipedon or the presence of a dark A or Ap soil horizon underlain by a high value, low chroma (light-gray) colored soil horizon with redoximorphic features (e.g., iron and manganese concentrations or depletions).

The term "wetland hydrology" encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Typical indicators of wetland hydrology include inundated soils, soils saturated to the surface, drainage patterns,

water marks, and morphological adaptations such as buttressed trunks, shallow root systems, or multiple stemmed trees.

All wetlands were classified using the *Classification of Wetlands and Deepwater Habitats of the United States* (USFWS, 1979). This water resource classification system was developed by the USFWS and is commonly referred to as “Cowardin Classification” (Appendix B). The Cowardin Classification is used to define wetlands and other aquatic resources by their landscape position, cover type, and hydrologic regime. Special modifiers can be added that describe water regime/chemistry, soil types, or disturbances.

Wetland boundaries were flagged using glo-pink survey flagging emblazoned with the words “WETLAND DELINEATION” and labeled with an alphanumeric code denoting the resource name and flag number. Wetland delineation data plots (a.k.a. “Corps plots”) were marked with glo-red survey flagging. Wetlands on the north side, south side, and median of the highway corridor were labeled “N-[wetland number]-[flag number]”, “S-[wetland number]-[flag number]”, and “M-[wetland number]-[flag number]”, respectively.

2.2 Constructed Stormwater Treatment Areas and Roadside Ditches

Constructed Stormwater Treatment Areas and Roadside ditches meeting the ACOE criteria to be considered wetlands were flagged as such. However, these areas may be considered Non-Jurisdictional Drainage Areas (NJDA) by regulators and are noted as such in this report. (NJDA designations herein were supplied by NHDOT in correspondence with Matt Urban and Marc Laurin.)

2.3 Streams- The following definitions were used for delineating streams:

- *Top-of-Bank (TOB)* "Bank" means the transitional slope immediately adjacent to the edge of a surface water body, the upper limit of which is usually defined by a break in slope. (Source: *New Hampshire Code Of Administrative Rules Env-Wt 101.07*).
- *Ordinary High Water (OHW)* is defined as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas (Source: <http://www.usace.army.mil/Portals/2/docs/civilworks/RGLS/rgl05-05.pdf>).

OHW and TOB were flagged with blue survey flagging. (Note that TOB and OHW did not diverge for any watercourses delineated within the survey area, therefore only blue flagging was used and therefore represented both.)

2.4 Non-Jurisdictional Drainages (Scoured Channels)- Non-jurisdictional drainages (a.k.a. scoured channels) are ephemeral drainages that are typically not jurisdictional under state and federal environmental regulations. These features do not meet either the definition of a stream or fail to display the three criteria required to be identified as a wetland. Examples of scoured channels may include, but are not limited to rock-filled channels, ephemeral drainage swales, ditch turnouts, swales with water-pushed leaf litter, or other similar features. Scoured channels were flagged with orange/black striped flagging.

2.5 Invasive Plants- The type, approximate extent, and location of invasive plant species were documented throughout the survey area, and GPS data was collected for each invasive plant community. Plant locations were not marked with flagging. Table 2 (below) lists the codes used to identify invasive plant species on delineation plans.

Table 2. Scientific name, common name, and species code of invasive plants noted on delineation plans.

Scientific Name	Common Name	Species Code
<i>Berberis thunbergii</i>	Japanese barberry	BETH
<i>Celastrus orbiculatus</i>	Asian bittersweet	CEOR
<i>Elaeagnus umbellata</i>	Autumn olive	ELUM
<i>Fallopia japonica</i>	Japanese knotweed	FAJA
<i>Frangula alnus</i>	Glossy false buckthorn	FRAL
<i>Lonicera morrowii</i>	Morrow's honeysuckle	LOMO
<i>Lythrum salicaria</i>	Purple loosestrife	LYSA
<i>Phragmites australis</i>	Common reed	PHAU
<i>Rosa multiflora</i>	Multiflora rose	ROMU

2.5 Global Positioning System (GPS) Data Collection- Each wetland, stream, and scoured channel flag was geo-located using a mapping-grade GPS unit (Trimble Geo 7x) utilizing the manufacturer's data collection and post-processing standards designed to achieve sub-meter accuracy. All post-processed data was then exported to the ESRI shapefile format in the coordinate system New Hampshire State Plane, Zone 4676 (FIPS 2800), NAD83, Survey Feet. In addition, GPS points were collected to represent each invasive plant community (a community represents an isolated grouping of an individual species). For watercourses less than six feet wide, GPS points were taken along the centerline of the flowing water. Centerlines were not marked with flagging. GPS data points were collected at culverts observed near mapped resources.

2.6 Wetland Functional Assessment

This wetland functional assessment was performed pursuant to the approach described by the Army Corps Highway Methodology Workbook Supplement: Wetland Functions and Values (USACE, 1995). In this "Descriptive Approach" to functional assessment, evaluators first determine if particular functions and values are present and why, followed by a determination of what functions and values are principal and why. Functions and values can be considered "principal" if they are an important physical component of a wetland ecosystem (function only), and/or are considered of special value to society, from a local, regional, and/or national perspective. When making determinations on the wetland, evaluators are encouraged to determine whether the wetland has the potential to serve the functions and values as well.

Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and that result from both living and non-living components of a specific wetland resource. These include all processes necessary for the self-maintenance of the wetland ecosystem such as primary productivity and nutrient cycling, among others. Therefore, functions relate to the ecological significance of wetland properties without regard to subjective human values.

Values are benefits that derive from one or more functions and the physical characteristics associated with a wetland. Most wetlands have corresponding societal value. The value of a particular wetland function, or combination of functions, is based on human judgment of the worth, merit, quality, or importance attributed to those functions. The 13 functions and values associated with a wetland functional assessment are described below:

Groundwater Recharge/Discharge: This function considers the potential for the wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

Floodflow Alteration (Storage & Desynchronization): This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecosystem or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

Fish and Shellfish Habitat: This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in providing fish and shellfish habitat.

Sediment/Toxicant/Pathogen Retention: This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens in runoff water from surrounding uplands, or upstream erosive wetland areas.

Nutrient Removal/Retention/Transformation: This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.

Production Export: This function evaluates the effectiveness of the wetland to produce food or usable products for man or other living organisms.

Sediment/Shoreline Stabilization: This function considers the effectiveness of the wetland in stabilizing stream banks and shorelines against erosion.

Wildlife Habitat: This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and migrating species are considered.

Recreation: This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting and other active or passive recreational activities.

Educational/Scientific Value: This value considers the suitability of the wetland as a site for an “outdoor classroom” or as a location for scientific study or research.

Uniqueness/Heritage: This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values, including archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, or its relative importance as a typical wetland class for the geographic location.

Visual Quality/Aesthetics: This value considers the visual and aesthetic quality or usefulness of the wetland.

Endangered Species Habitat: This value considers suitability of the wetland to support threatened or endangered species.

3. Results

3.1 Wetland and Stream Delineation

A total of 53 individual wetlands, 6 sections of stream, and 16 scoured channels (non-jurisdictional drainages) were delineated within the survey area. Summaries of findings for wetland and stream delineations are presented in Tables 3 and 4, respectively and wetland descriptions and results of functional assessments are below. Wetland, stream, scoured channel, and invasive species locations are shown on the wetland delineation maps included with this report.

For this project, Chapter 5 of U.S. Army Corps of Engineers. (2012), *Difficult Wetland Situations in the Northcentral and Northeast Region* was closely followed due to the substantial hydrologic alterations associated with I-93 and abutting roadways and residential and commercial development. Due to the observation of very high water in Harris Brook in December 2018, Chris Dorion conferenced with Steve Gagnon of the Methuen, MA Public Works Department the high water level observed in the brook (the culvert on Hampshire Road was completely inundated). Mr. Gagnon reported that a MA conservation officer had recently removed several beavers (*Castor canadensis*) on Harris Brook in 2018 and subsequently destroyed existing beaver dams restoring water levels to those more typical for the time of year.

Table 3. Summary of wetland survey results for the NHDOT Salem-Manchester, Interstate Route 93 Project. For wetland number, N, S, and M denote north side, south side, and median, respectively. NJDA = Non-Jurisdictional Drainage Area¹ See Appendix B for Cowardin classifications.

Wetland Number	Cowardin Classification	Remarks
N1	PEM1J	Riparian wetland associated with the Spickett River.
N2	PFO1F/H	Oxbow wetland associated with the Spickett River.
N3	PEM1J	Riparian wetland associated with the Spickett River.
N4	PFO1C	Small hydrologically-isolated forested wetland. Potential vernal pool.
N5	PFO1E	Forested wetland in vicinity of rest area. Contains a potential vernal pool.
N6	NJDA (PEM1Hx)	Constructed stormwater retention pond.
N7	NJDA (PEM1/PUBHx)	Constructed stormwater retention pond.
N8	NJDA (PEM1Jx)	Roadside ditch.
N9	PFO1E	Forested wetland between residence and I-93.
N10	PEM1J	Riparian wetland associated with Porcupine Brook.
N11	PEM1/PSS1J	Riparian wetland associated with Porcupine Brook.
N12	PEM1J	Riparian wetland associated with Porcupine Brook.
N13	PEM1J	Riparian wetland associated with Porcupine Brook.
N14	PEM1J	Riparian wetland associated with Porcupine Brook.
N15	PFO1E	Forested wetland near rest area.
N16	PFO1E	Forested wetland near rest area.
N17	PUBHh	Constructed impoundment.
M1	PFO1E	Potential vernal pool.
M2	PFO1E	Potential vernal pool. Contains black-gum (<i>Nyssa sylvatica</i>) tree.
M3	PFO1E	Potential vernal pool.
M4	NJDA (PEM1Jx)	Constructed stormwater treatment wetland.

¹ Areas mapped as NJDA were constructed for the treatment of stormwater.

Wetland Number	Cowardin Classification	Remarks
M5	NJDA (PEM1Jx)	Constructed stormwater treatment wetland.
M6	PEM1Jx	Roadside ditch.
M7	NJDA (PEM1Jx)	Constructed stormwater treatment wetland.
M8	NJDA (PEM1/PUBHx)	Retention pond.
M9	PEM1/PUBHx	Constructed stormwater treatment wetland.
M10	NJDA (PEM1Jx)	Constructed stormwater treatment wetland.
M11	NJDA (PEM1Jx)	Roadside ditch
M12	NJDA (PEM1/PFO1E)	Natural modified forested/emergent marsh complex.
M13	NJDA (PEM1Jx)	Roadside Ditch
M14	PSS1E	Scrub-shrub wetland in highway median.
S1	PFO1E	Riparian wetland associated with the Harris Brook tributary.
S2	PFO1E	Small hydrologically-isolated forested wetland.
S3	PFO1E	Forested wetland extending offsite.
S4	PFO1E	Forested wetland with PVPs. Extends beyond survey area.
S5	PFO1E	Hydrologically-isolated forested wetland. Potential vernal pool.
S6	PFO1E	Hydrologically-isolated forested wetland. Potential vernal pool.
S7	PFO1J	Former channel of the Harris Brook tributary.
S8	PEM1J	Riparian wetland associated with the Harris Brook tributary.
S9	PFO1E	Large forested wetland.
S10	NJDA (PEM1Jx)	Roadside ditch.
S11	NJDA (PEM1Jx)	Roadside ditch.
S12	PEM1Cx	Constructed wetland mitigation site. Extends beyond survey area.
S13	PEM1Ex	Constructed wetland mitigation site. Extends beyond survey area.
S14	PEM1Ex	Historic agricultural ditch. Extends beyond survey area.
S15	NJDA (PEM1Jx)	Constructed stormwater treatment wetland.
S16	NJDA (PEM1Jx)	Constructed stormwater treatment wetland.
S17	PFO1E	Forested wetland with potential vernal pools.

Wetland Number	Cowardin Classification	Remarks
S18	PFO1E	Forested wetland with potential vernal pools.
S19	PFO1E	Hydrologically-isolated wetland.
S20	PFO1E/PEM1J	Large wetland complex containing potential vernal pools. Extends beyond survey area.
S21	PFO1F	Potential vernal pool.
S22	PEM5E	<i>Phragmites</i> marsh.
S23	PFO1E	Small hydrologically-isolated forested wetland.
S24	PFO1E	Small forested wetland.

Table 4. Summary of stream survey results for the NHDOT Salem-Manchester, Interstate Route 93 Project.

Stream Number	Stream Name	Cowardin Classification
N-S1	Policy Brook	R2UB3
N-S2	Porcupine Brook	R2UB3
N-S3	Spickett River	R2UB3
S-S1	Harris Brook tributary	R2UB3
S-S2	-	R4SB5
S-S3	-	R4SB5
S-S4	-	R4SB5

3.2 Riparian Forested Wetlands

One forested riparian wetland system is present within the survey area. All other delineated riparian systems were classified as emergent marshes (described below).

Wetland S1

Wetland S1 is a seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland (PFO1E). At its eastern half is a riparian system running roughly parallel with the Harris Brook tributary. As one travels west, the wetland diverges from, but runs ~ parallel to, the Harris Brook tributary.

At the USACE plot location, red maple (*Acer rubrum*) dominates the tree layer and glossy false buckthorn dominates the shrub layer. Nodding sedge (*Carex gynandra*) and small-spiked false nettle (*Boehmeria cylindrica*) dominate the herb layer. Soils within the wetland met the criteria for field indicator A2-Histic Epipedon as the soil profile contained an 11-inch thick O horizon. Observed primary indicators of hydrology consisted of Surface Water (A1), High Water Table (A2), Saturation (A3), and Water-Stained Leaves (B9).

Principal functions of wetland S1 are Floodflow Alteration and Wildlife Habitat. Other suitable functions consist of Groundwater Discharge, Production Export, and Sediment/Shoreline Stabilization.

Wetland S2

Wetland S2 is a seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland (PFO1E). The wetland was originally mapped separately from Wetland S1 however upon field verification it was determined to be encompassed by (and therefore a part of) Wetland S-1

The forest canopy above the wetland consists of red maple trees. Silky dogwood (*Swida amomum*) is present in the shrub layer. Sensitive fern and royal fern are present in the herb layer.

The principal function of wetland S2 is Wildlife Habitat. Other suitable functions consist of Groundwater Recharge and Production Export.

3.3 Forested Wetlands

A total of 22 (non-riparian) forested wetlands were delineated within the survey area, all of which have a canopy dominated by broad-leaved deciduous trees. These wetlands range from small, hydrologically-isolated depressions to large complexes which extend beyond the survey boundary. USACE forms were completed for wetlands N4, N9, N15, M3, S4, S7, S9, S17, S18, S20, S23, and S24.

Wetland N4

Wetland N4 is a small, hydrologically-isolated depressional wetland that meets the classification of a seasonally-flooded palustrine (broad-leaved deciduous) forested wetland (PFO1C). It was likely created as a result of human activity as the wetland appears to be a former borrow pit. Soils within the wetland met the criteria for field indicator Sandy Redox (S5) as the profile contained a horizon within six inches of the soil surface consisting of fine loamy sand containing redoximorphic features. Sparsely vegetated

concave surface (B8) and water-stained leaves (B9) and were the observed primary indicators of hydrology.

Vegetation at the sample location was dominated by red maple and American elm (*Ulmus americana*) with white pine (*Pinus strobus*) also present. American elm and glossy buckthorn (*Frangula alnus*) dominate the shrub layer. No vegetation was observed to be dominant in the herb stratum; the basin of the wetland was observed to be sparsely vegetated containing only several glossy buckthorn and red maple seedlings.

Wildlife habitat serves as the sole principal function for this wetland as it may be used by pool-breeding amphibians during the spring. (The wetland was identified as a potential vernal pool, which would need to be further assessed to determine if it meets the requirement for designation as a vernal pool.)

The wetland is also suitable for Production/Export and Groundwater Recharge.

Wetland N5

Wetland N5 is a seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland that lies east of the rest area. The wetland continues outside the survey area to the east. Soils within the wetland met the criteria for field indicators Depleted Below Dark Surface (A11) and Sandy Redox (S5) as the soil profile contains a depleted matrix with redoximorphic features within six inches of the soil surface overlain by a dark surface horizon. The sole primary indicator of hydrology observed in the wetland consisted of water-stained leaves (B9).

At the sample plot location the tree layer within the wetland is dominated by red maple. Glossy buckthorn and red maple are dominant within the shrub layer. The herb layer at the sample location is sparsely vegetated with only several red maple and glossy buckthorn seedlings present.

Wildlife habitat serves as the sole principal function for this wetland as it may be used by pool-breeding amphibians during the spring. (The wetland contains an area identified as a potential vernal pool, which would need to be further assessed to determine if it meets the requirement for designation as a vernal pool.) The wetland is also suitable for Production/Export and Groundwater Recharge.

Wetland N9

Wetland N9 is a seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland situated in-between a residence and the I-93 exit ramp to Rockingham Park Boulevard. The wetland continues outside of the survey area to the northeast. At the sample location the wetland's canopy consisted of red maple and red oak while the shrub layer consists entirely of glossy buckthorn. Dominant herbaceous vegetation within the wetland consisted of sensitive fern (*Onoclea sensibilis*) and glossy false buckthorn seedlings.

Soils within the wetland met the criteria for F6-Redox Dark Surface as the profile contained a very dark layer greater than four inches thick within 12 inches of the soil surface that contained redoximorphic concentrations. The sole primary indicator of hydrology consisted of Water-Stained Leaves (B9).

Principal functions provided by wetland N9 are Sediment/Toxicant Retention and Nutrient Removal due to the proximity of the wetland to I-93 and a residence. The wetland is also provides Groundwater Recharge.

Wetlands N15 and N16

Wetlands N15 and N16 are seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetlands (PFO1E). The canopy of the wetlands is dominated by red maple, however, white pine is also a component as it grows on hummocks within the wetlands. Glossy buckthorn dominates the shrub stratum of both wetlands although highbush blueberry (*Vaccinium corymbosum*) is also present. Dominant herbaceous vegetation within the wetlands consists of cinnamon fern (*Osmundastrum cinnamomeum*) and royal fern (*Osmundastrum spectabilis*).

Soils within the wetland met the criteria for Field Indicator Depleted Below Dark Surface (A11) as the soil profile exhibited a depleted matrix within 12" of the surface overlain by a dark A horizon. Water-stained leaves (B9) was the sole observed indicator of hydrology.

Groundwater Recharge and Production Export are the principal functions of these wetlands. They also provide Wildlife Habitat.

Wetland M1

Wetland M1 is a potential vernal pool as it is a sparsely-vegetated concave area in a forested setting. (Further assessment is necessary to determine if the wetland meets the requirement for designation as a vernal pool.) It meets the classification of a seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland (PFO1E). The tree canopy surrounding the wetland consists of red maple and white oak. The pool depression contains no vegetation but is surrounded by highbush blueberry. The principal function of this wetland is nutrient removal due to its proximity to I-93. It also provides for Sediment/Toxicant Retention and Groundwater Recharge.

Wetland M2

Wetland M2 is a potential vernal pool as it is a sparsely-vegetated concave area in a forested setting. (Further assessment is necessary to determine if the wetland meets the requirement for designation as a vernal pool.) It meets the classification of a seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland (PFO1E). The canopy over the wetland consists of red maple. The pool depression is sparsely vegetated but is ringed by highbush blueberry, sapling white pines, and glossy buckthorn. The principal function of this wetland is nutrient removal due to its proximity to I-93. It also provides for Sediment/Toxicant Retention and Groundwater Recharge.

Wetland M3

Wetland M3 is a potential vernal pool as it is a sparsely-vegetated concave area in a forested setting. (Further assessment is necessary to determine if the wetland meets the requirement for designation as a vernal pool.) It meets the classification of a seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland (PFO1E).

At the USACE data plot location the tree canopy is dominated by red maple and white pine. The pool depression is sparsely vegetated but is ringed by highbush blueberry and glossy buckthorn.

The principal function of this wetland is nutrient removal due to its proximity to I-93. It also provides for Sediment/Toxicant Retention and Groundwater Recharge.

Wetland S3

Wetland S3 is a seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland (PFO1E) which continues outside the survey boundary to the west. A small stream channel (S-S2) runs from within the wetland into the Harris Brook tributary.

The tree and shrub layers contain red maple and silky dogwood, respectively. Small-spiked false nettle is the dominant plant within the herb layer which also contains fringed sedge (*Carex crinita*), hop sedge (*Carex lupulina*), northeastern manna grass (*Glyceria striata*), and sensitive fern.

Wetland S4

Wetland S4 is a seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland (PFO1E) which contains potential vernal pools and continues beyond the survey boundary to the west. Red maple dominates the canopy at the USACE plot location. There is no shrub layer and the portion of the wetland within the survey area is a sparsely-vegetated concave surface which contained only several red maple seedlings.

Soil within the wetland met the criteria for field indicator A2-Histic Epipedon as the soil profile contained twelve inches of organic material starting at the ground surface. Observed primary indicators of hydrology consisted of Sparsely Vegetated Concave Surface (B8) and Water-Stained Leaves (B9).

Principal functions of wetland S4 are Groundwater Recharge and Wildlife Habitat. The wetland contains potential vernal pools and may be used by pool-breeding amphibians. (The wetland was identified as a potential vernal pool, which would need to be further assessed to determine if it meets the requirement for designation as a vernal pool.)

Wetland S5

Wetland S5 is a hydrologically-isolated seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland (PFO1E). The canopy of the wetland is dominated by red maple. The shrub layer contains highbush blueberry and the herb layer contains royal fern, sallow sedge (*Carex lurida*) and greater bladder sedge (*Carex intumescens*).

Principal functions of wetland S5 are Groundwater Recharge and Wildlife Habitat. The wetland is a potential vernal pool and may be used by pool-breeding amphibians. (The wetland would need to be further assessed to determine if it meets the requirement for designation as a vernal pool.)

Wetland S6

Wetland S6 is a hydrologically-isolated seasonally flooded/saturated palustrine forested (broad-leaved deciduous) wetland (PFO1E). The canopy of the wetland is dominated by red maple. The shrub layer

contains highbush blueberry and the herb layer contains royal fern, and several species of sedges (*Carex* spp.).

Principal functions of wetland S6 are Groundwater Recharge and Wildlife Habitat. The wetland is a potential vernal pool and may be used by pool-breeding amphibians. (The wetland would need to be further assessed to determine if it meets the requirement for designation as a vernal pool.)

Wetland S7

Wetland S7 is an intermittently flooded palustrine forested (broad-leaved deciduous) wetland (PFO1E); it is a former channel of the Harris Brook tributary. Red maple dominates the forest canopy at the USACE plot and the shrub stratum contains only glossy false buckthorn. Greater bladder sedge and northeastern manna grass are dominant in the herb layer.

Soils within the wetland met the criteria for field indicator A2-Histic Epipedon as the soil profile contains eight inches of organic material starting at the soil surface. Water Stained Leaves (B9) constituted the sole observed indicator of hydrology.

Principal functions of wetland S7 consist of Floodflow Alteration, and Sediment/Toxicant Retention. Other suitable functions consist of Groundwater Recharge, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, and Wildlife Habitat.

Wetland S9

This wetland is a large palustrine forested (broad leaved deciduous) (PFO1) wetland which continues northwestward after the Harris Brook tributary terminates. In spots the wetland continues into the yards of residences west of the I-93 corridor.

Red maple dominates the forest canopy at the USACE plot location. There is no shrub layer and the herb layer consists entirely of slender wood-reed (*Cinna latifolia*). Other plants observed within the wetland include American elm, glossy false buckthorn, royal fern, interrupted fern (*Osmunda claytoniana*), jewelweed, northeastern manna grass, and numerous species of sedge (*Carex* spp.)

Soils within the wetland met the criteria for field indicator F3-Depleted Matrix as the soil profile contains a 13+ inch layer with a depleted matrix that starts from within ten inches of the mineral soil surface. Water-Stained Leaves (B9) constituted the sole observed indicator of hydrology.

Principal functions for wetland S9 are Floodflow Alteration, Sediment/Toxicant Retention, and Nutrient Removal. Other suitable functions consist of Groundwater Recharge/Discharge, Production Export, Sediment/Shoreline Stabilization, and Wildlife Habitat.

Wetland S17

Wetland S17 is a depression component of a larger wetland complex that includes wetlands S15 and S14. It is a seasonally flooded/saturated forested (broad-leaved deciduous) wetland (PFO1E). At the USACE plot location, red maple is the sole dominant plant within the tree, shrub, and herb strata. Soils within the wetland met the criteria for field indicator A2-Histic Epipedon as the soil profile contains an 11-inch layer

of organic material. Observed indicators of hydrology consisted of water-stained leaves (B9) and geomorphic position (D2).

Wildlife Habitat is the principal function of the wetland as it is a potential vernal pool and hence might be used by pool-breeding amphibians. (The wetland would need to be further assessed to determine if it meets the requirement for designation as a vernal pool.) Other suitable functions are Groundwater Recharge and Production Export.

Wetland S18

Wetland S18 is seasonally flooded/saturated forested (broad-leaved deciduous) wetland (PFO1E) which continues outside of the survey area to the west. At the USACE plot location, red maple is dominant within the tree stratum and highbush blueberry is dominant within the shrub stratum. The herb stratum is dominated by sedges (*Carex* sp.) and wool sedge (*Scirpus cyperinus*) with three-way sedge (*Dulichium arundinaceum*), dwarf raspberry (*Rubus pubescens*), red maple, and prickly lettuce (*Lactuca serriola*) is also present.

Soils within the wetland met the criteria for field indicator S6-Stripped Matrix as the soil profile contains a thick E-horizon displaying multiple streaking of discrete organic matter and/or iron and manganese oxides. The sole observed primary indicator of hydrology consisted of Water-Stained Leaves (B9).

Wildlife Habitat serves as the principal function of the wetland as it contains areas that are potential vernal pools. (The potential vernal pools require further assessment to determine if they in fact meet the requirements for designation as vernal pools.) Groundwater Recharge and Production Export are also provided by the wetland but are not principal functions.

Wetland S19

Wetland S19 is a very small wetland area just north of wetland S18. It is a seasonally-flooded palustrine forested (broad leaved deciduous) wetland (PFO1E). Red maple dominates the canopy.

Wetland S20

Wetland S20 is a large wetland complex which extends beyond the survey area to the west. The wetland contains both seasonally flooded/saturated forested (broad-leaved deciduous) wetland (PFO1E) and intermittently flooded palustrine emergent marsh (PEM1J) components, the former containing several potential vernal pool areas. (The potential vernal pools require further assessment to determine if they in fact meet the requirements for designation as vernal pools.)

Red maple is the dominant tree at USACE plot location within the forested portion of the wetland. The shrub layer at this location is dominated by highbush blueberry and the herb layer contains only several red maple seedlings. Soils at this location met the criteria for field indicator A1-Histosol. Observed indicators of hydrology at this location consisted of sparsely vegetated concave surface (B8), water-stained leaves (B9), and geomorphic position (D2).

Purple loosestrife (*Lythrum salicaria*) is dominant within the entire marsh area of the wetland with some broad-leaved cattail (*Typha latifolia*) also present. Soil at the USACE plot location met the criteria for

field indicator A2-Histic Epipedon. Observed indicators of hydrology within the marsh consisted of Sparsely Vegetated Concave Surface and Water-Stained Leaves (B9).

Wildlife Habitat is the principal function for the forested portion of wetland S20 which also provides Groundwater Recharge and Production Export. Groundwater Recharge is the principal function of the marsh portion of the wetland. This section of the wetland also provides for Floodflow Alteration, Fish and Shellfish Habitat, Production Export, and Sediment/Shoreline Stabilization.

Wetland S21

Wetland S21 is a small, semipermanently flooded forested (broad leaved deciduous) wetland (PFO1F) and a potential vernal pool. (The wetland requires further assessment to determine if it fact meets the requirements for designation as a vernal pool.) Red maple is prevalent in the canopy surrounding the pool, and highbush blueberry is present in the shrub layer. Observed vegetation in the herb layer included wool grass, cinnamon fern, and several species of sedge (*Carex* spp.).

Wetland S23

Wetland S23 is a small, seasonally flooded/saturated forested (broad-leaved deciduous) wetland (PFO1E). At the USACE plot location red maple is the dominant tree species and highbush blueberry the dominant shrub. The herb layer is sparse and contains only several cinnamon ferns and glossy buckthorn seedlings. Soils within the wetland met the criteria for field indicator A2-Histic Epipedon. Observed indicators of hydrology consisted of Sparsely Vegetated Concave Surface (B8) and Water-Stained Leaves (B9).

Principal functions provided by this wetland are Production Export and Wildlife Habitat. It also provides Groundwater Recharge.

Wetland S24

Wetland S24 is a small, seasonally flooded/saturated forested (broad-leaved deciduous) wetland (PFO1E). Red maple dominates the canopy above the wetland and common winterberry and highbush blueberry comprise the shrub layer. No plants are present within the herb layer of the wetland – the groundcover consists entirely of water-stained leaves (hydrology indicator B9). The other observed indicator of hydrology consisted of sparsely-vegetated concave surface (B8). Soils within the wetland met the criteria for field indicator A1-Histosol as the soil profile consists of 21+ inches of organic material.

Wildlife Habitat is the Principal function of wetland S24. The wetland also provides for Groundwater Recharge.

3.4 Riparian Emergent Wetlands

A total of seven riparian emergent wetlands were delineated within the survey area – one associated with the Spickett River, five with Porcupine Brook, and one with the Harris Brook tributary. USACE forms were filled out for wetlands N1, N12, and S8 to serve as representative wetland and upland data plots for this wetland type.

Wetlands N1, N2, and N3

These wetlands are part of contiguous riparian system associated with the Spickett River. Wetlands N1 and N3 are palustrine emergent marshes that are intermittently flooded (PEM1J). Only a small portion of wetland N2 is within the survey area which is a small channel that leads to an oxbow pool which is a palustrine forested (broad-leaved deciduous) wetland that is semipermanently or permanently flooded. Soils within the wetland met the requirements for field indicator Depleted Below Dark Surface (A11) as the soil profile exhibited a depleted matrix within 12" of the surface overlain by a dark A horizon with redoximorphic features. Observed primary indicators of hydrology consisted of a high water table (A2), saturation (A3), water marks (B1), sediment deposits (B2), drift deposits (B3), and water-stained leaves (B9).

Dominant vegetation at the sample location consists of river birch (*Betula nigra*), red maple, and white oak (*Quercus alba*) in the tree layer and small-spiked false nettle in the herb layer. The wetland did not contain a shrub layer. Note that this wetland contains river birch, which is listed the New Hampshire Natural Heritage Bureau as S2, Threatened.

Principal functions of this wetland complex consist of Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, and Uniqueness/Heritage. Uniqueness/Heritage is a principal function of the wetland complex as numerous mature river birches (*Betula nigra*), State-listed as Threatened, were observed within it.

Wetland N10

Wetland N10 is a small area of riparian wetland associated with Porcupine Brook. The area is a intermittently flooded palustrine emergent wetland (PEM1J). Observed vegetation within the wetland consisted of narrow-leaved cattail, pickerelweed (*Pontederia cordata*), buttonbush (*Cephalanthus occidentalis*), and sensitive fern. (The USACE plot for wetland N12 is representative of this wetland.)

Wetland N11

Wetland N11 is a very small area of riparian intermittently flooded palustrine emergent marsh/scrub shrub associated with Porcupine Brook (PEM1/PSS1J). Buckthorn and arrowwood (*Viburnum dentatum*) are the dominant shrubs within the wetland. Dominant herbaceous vegetation consists of royal fern and sensitive fern. (The USACE plot for wetland N12 is representative of this wetland.)

Wetland N12

Wetland N12 is a small area of riparian intermittently flooded palustrine emergent marsh situated along Porcupine Brook (PEM1J). At the USACE plot location the tree stratum was dominated by red maple. No dominant shrubs were present and the herb layer was dominated by lamp rush, creeping bentgrass (*Agrostis stolonifera*), and narrow-leaved cattail. Soils within the wetland met the criteria for Field Indicator A11-Depleted Below Dark Surface as the soil profile exhibited a depleted matrix within 12" of the surface overlain by a dark A horizon. Observed indicators of hydrology at wetland N12 consisted of Surface Water (A1), High Water Table (A2), and Water-Stained Leaves (B9).

Principal functions of wetlands N10, N11, N12, N13, and N14 are Floodflow Alteration, Sediment/Toxicant Retention and Nutrient Removal. The wetlands also provide Groundwater Discharge, Production Export, Sediment/Shoreline Stabilization, and Wildlife Habitat.

Wetland N13

Wetland N13 is a small area of riparian intermittently flooded palustrine emergent marsh situated along Porcupine Brook (PEM1J). Observed vegetation within the wetlands consisted of several small speckled alders (*Alnus incana*) lamp rush, sensitive fern, several species of sedge (*Carex* spp.), some reed canary grass and several small purple loosestrife plants showing evidence of *Galerucella* sp. beetle predation. (The USACE plot for wetland N12 is representative of this wetland.)

Wetland N14

Wetland N13 is a small area of riparian intermittently flooded palustrine emergent marsh situated along Porcupine Brook (PEM1J). Observed vegetation within the wetland consisted of narrow-leaved cattail, several species of sedge (*Carex* spp.), and common spikeweed (*Eleocharis palustris*).

Wetland S8

Wetland S8 is a riparian palustrine emergent marsh (PEM1) associated with the Harris Brook tributary. At the USACE plot location white pine and American elm dominate the canopy. (Note the white pines are growing in the surrounding uplands.) Silky dogwood is dominant in the shrub layer and the herb layer is dominated by jewelweed and sensitive fern.

Soils within the wetland met field indicators A2-Histic Epipedon and A11-Depleted Below Dark Surface as the profile contained an 11-inch thick organic layer underlain by a depleted horizon. Observed indicators of hydrology consisted of High Water Table (A2), Saturation (A3), and Water-Stained Leaves (B9).

Principal functions of wetland S8 are Floodflow Alteration and Sediment/Toxicant Retention as the wetland is a riparian system adjacent to residential development. Other suitable functions consist of Groundwater Discharge, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, and Wildlife Habitat.

3.5 Scrub-shrub wetland

One scrub-shrub wetland was delineated in the highway median.

Wetland M14

Wetland M14 is a seasonally flooded/saturated palustrine scrub-shrub wetland with deciduous vegetation (PSS1E). Observed vegetation within this wetland includes European buckthorn (*Rhamnus cathartica*), highbush blueberry, and red osier dogwood (*Swida sericea*). The wetland receives a significant amount of hydrologic input from stormwater runoff from I-93. Soils within the wetland met the criteria for Field Indicator Sandy Mucky Mineral (S1) as the profile contained eight inches of mucky loamy fine sand which started at the mineral soil surface.

3.6 Emergent Wetlands Constructed for Stormwater Treatment

A total of nineteen manmade or highly modified for stormwater treatment wetlands were delineated within the survey area. These wetlands range from roadside ditches that meet the vegetation, soil, and hydrology criteria to be considered a wetland to large retention basins. These sites are integral components of the highway drainage system that provide treatment of stormwater and as such are classified as non-jurisdictional drainage areas.

USACE forms were completed for wetlands N6, M10, M12, and S12 to serve as representative wetland and upland data plots for this wetland type.

Wetland N6 (NJDA)

Wetland N6 is a manmade wetland used to treat stormwater within the vicinity of the rest area; it meets the classification of a permanently flooded palustrine emergent marsh (PEM1H). Much of the wetland contained standing water during the survey. This inundated area was dominated by cattails (*Typha angustifolia*) and common reed (*Phragmites australis*).

There were no trees present within the sample plot location but the shrub layer was dominated by long-beaked willow (*Salix bebbiana*) and speckled alder (*Alnus incana*). The herb layer was dominated by lamp rush (*Juncus effusus*) and royal fern. Soil within the wetland met the criteria for the field indicator Depleted Below Dark Surface (A11) as the soil profile contains a depleted matrix with redoximorphic features within six inches of the soil surface overlain by a dark surface horizon. Observed indicators of hydrology consisted of surface water (A1), high water table (A2), and saturation (A3).

Principal functions of wetland N6 are Floodflow Alteration, Sediment Toxicant Retention, and Nutrient Removal.

The USACE sample plot and functional assessment for at this location is also representative of wetlands N7 and N8.

Wetland N7 (NJDA)

Wetland N7 is a manmade stormwater treatment wetland. It is a permanently-flooded palustrine emergent marsh/unconsolidated bottom wetland (PEM1/PUBH). Much of the wetland consists of open water with a floating mat of algae. Shallower areas of the wetland are dominated by narrow-leaved cattail.

Wetland N8 (NJDA)

This wetland is a roadside ditch. It is an intermittently flooded palustrine emergent wetland. Observed wetland vegetation included several sedge species (*Carex* spp.), and several small purple loosestrife plants showing signs of *Galerucella* sp. beetle predation. During the field survey the wetland contained areas devoid of vegetation that formerly contained standing water.

Wetland M4 (NJDA)

Wetland M4 is a constructed stormwater treatment wetland on the side of I-93. It is an intermittently flooded palustrine emergent marsh (PFO1J) dominated by narrow-leaved cattail with some purple loosestrife also present. The purple loosestrife showed evidence of predation by *Galerucella* sp. beetles.

The outlet of this wetland is scoured channel M-SC-3. The channel runs for approximately 30 feet before dissipating into upland forest.

Wetland M5 (NJDA)

This wetland is a large, linear constructed stormwater treatment wetland running along I-93. It is an intermittently flooded palustrine emergent marsh (PFO1J). Vegetation in the wetland consists of narrow-leaved cattail, lamp rush, sedges (*Carex* spp.), and some purple loosestrife which showed evidence of predation by *Galerucella* sp. beetles.

Wetland M6

Wetland M6 is a small intermittently flooded palustrine emergent marsh (PFO1J) in the highway median. Observed wetland vegetation consisted of lamp rush, wool sedge, sedges (*Carex* spp.), and purple loosestrife which showed evidence of predation by *Galerucella* sp. beetles.

Wetland M7 (NJDA)

This wetland is a constructed stormwater treatment wetland in the highway median. It is an intermittently flooded palustrine emergent marsh (PFO1J). Observed wetland vegetation consisted of common fox sedge (*Carex vulpinoidea*) and lamp rush.

Wetland M8 (NJDA)

Wetland M8 is a constructed stormwater treatment wetland in-between I-93 and it's Exit 1 on-ramps. The wetland is a palustrine emergent marsh/unconsolidated bottom wetland (PEM1/PUBH). The wetland contains areas of open water and areas dominated by narrow-leaved cattail.

Wetland M9

Wetland M9 is a constructed stormwater treatment wetland meeting the classification of a palustrine emergent marsh/unconsolidated bottom wetland (PEM1/PUBH). The wetland contains areas of open water and areas dominated by narrow-leaved cattail. Some reed canary grass and purple loosestrife is also present, the latter which showed evidence of predation by *Galerucella* sp. beetles.

Wetland M10 (NJDA)

Wetland M10 is a large stormwater treatment wetland which meets the classification of an intermittently flooded palustrine emergent marsh (PEM1). Vegetation within the wetland includes narrow-leaved cattail, sedges, lamp rush, and dead purple loosestrife. Vegetation at the USACE sample plot location was dominated by wool sedge and narrow-leaved cattail. Soils met the criteria for field indicator F6-Redox Dark Surface as the soil profile contains as within 12 inches of the surface a dark layer with redoximorphic features. Principal functions of wetland M10 consist of Sediment/Toxicant Retention and Nutrient Removal.

Wetland M11 (NJDA)

Wetland M11 is a roadside ditch draining to wetland M9 which meets the classification of an intermittently flooded palustrine emergent marsh (PEM1). Wetland vegetation within the wetland consists of lamp rush and reed canary grass.

Wetland M12 (NJDA)

Wetland M12 is a large wetland in-between I-93 and the southbound exit 1 on- and off-ramp. The wetland contains both a natural palustrine forested (broad-leaved deciduous) and a constructed emergent marsh component (PEM1). At the USACE sample plot location the canopy is dominated by red maple and American elm, the shrub layer is dominated by glossy false buckthorn and the herb layer is dominated by bluejoint (*Calamagrostis canadensis*) and marsh fern (*Thelypteris palustris*). Observed indicators of hydrology consisted of Surface Water (A1), High Water Table (A2), and Water-Stained Leaves (B9).

Principal functions of this wetland complex consist of Sediment/Toxicant Retention and Nutrient Removal. It is also suitable for Groundwater Recharge, Production Export, and Wildlife Habitat.

Wetland M13 (NJDA)

Wetland M13 is a roadside ditch meeting the classification of a palustrine emergent wetland (PEM1). Vegetation within the wetland consists of narrow-leaved cattail, lamp rush, and dead purple loosestrife.

Wetland S10 (NJDA)

Wetland S10 is a roadside ditch that meets the hydrology, vegetation, and soil criteria to be considered a wetland. It is an intermittently flooded palustrine emergent marsh (PEM1J). Observed vegetation within the wetland includes wool sedge, lamp rush, several sedge species (*Carex* spp.), and reed canary grass (*Phalaris arundinacea*).

Wetland S11 (NJDA)

Wetland S11 is a roadside ditch that meets the hydrology, vegetation, and soil criteria to be considered a wetland. It is an intermittently flooded palustrine emergent marsh (PEM1J). Observed vegetation within the wetland includes whorled yellow loosestrife (*Lysimachia quadrifolia*) and spotted Joe-Pye weed (*Eupatorium maculata*).

Wetland S15 (NJDA)

Wetland S15 is a constructed stormwater treatment wetland meeting the classification of an intermittently flooded palustrine emergent marsh (PEM1J). Observed vegetation within the wetland includes creeping bentgrass, wool sedge, lamp rush, sensitive fern, sallow sedge, and cattails. This wetland is at the eastern boundary, and is contiguous with, wetland S17.

Wetland S16 (NJDA)

Wetland S16 is a constructed stormwater treatment wetland meeting the classification of an intermittently flooded palustrine emergent marsh (PEM1J). Vegetation observed within the wetland includes speckled

alder, wool sedge, purple loosestrife (showing evidence of beetle predation), lamp rush, swamp candles (*Lysimachia terrestris*), and tearthumb (*Persicaria sagittata*).

3.5 Other Emergent Wetlands

Four additional emergent wetlands were delineated within the survey area.

Wetlands S12 & S13

Wetlands S12 & S13 are both part of a constructed wetland mitigation site which extends outside of the survey area to the west. It is a seasonally-flooded palustrine emergent wetland (PEM1). Dominant vegetation at the sample plot location consisted of narrow-leaved cattail, and spikerush (*Eleocharis* sp.).

Soil at the sample plot met for field indicator A11-Depleted Below Dark Surface. Water-stained leaves (B9) were the sole observed primary indicator of hydrology.

The principal functions of wetland S12 is Groundwater Recharge, Sediment/Toxicant Retention, and Nutrient Removal. Other suitable functions are Floodflow Alteration and Production Export.

Wetland S14

Wetland S14 is a historical agricultural ditch that meets the hydrology, vegetation, and soil criteria to be considered a wetland. It is a seasonally flooded palustrine emergent wetland (PEM1) which is contiguous with wetland S15 and also extends offsite to the west. Observed vegetation within the wetland includes royal fern, sensitive fern, and bluejoint. The water table within the wetland was observed to be six inches below the soil surface (indicator A2-High Water Table) and Water-Stained Leaves (B9) were also observed.

Wetland S22

Wetland S22 is a very small seasonally flooded/saturated palustrine emergent marsh (PEM5E) dominated by *Phragmites australis*. Other observed vegetation within the wetland included poison ivy, jewelweed, and sensitive fern.

3.6 Constructed Impoundment

Wetland N17

Wetland N17 is an impoundment of Porcupine Brook (Stream N-S2) at the northern end of the survey area. The pond meets the classification of an impounded palustrine unconsolidated bottom wetland with a mud substrate (PUBHh). The outlet of the wetland flows north outside of the survey area.

3.7 Streams

Seven streams were delineated within the survey area. The Spickett River, Policy Brook, Porcupine Brook, and the Harris Brook tributary are all lower perennial systems while the remaining three streams are unnamed small intermittent tributaries.

Stream N-S1 – Policy Brook

Policy Brook is a riverine lower perennial stream with a mud substrate (R2UB3). The watercourse for the most part has been channelized to follow south along the I-93 corridor. A portion of Policy Brook that was reconstructed as mitigation for I-93 flows to the east outside the survey area in the vicinity of Haigh Avenue prior to its confluence with the Spickett River. It flows into the area from the east as a natural meandering stream in-between the rest area and public works department complex. The brook averages 30 feet wide throughout the survey area and varies in depth from several inches to several feet. Ordinary high water and top-of-bank coincide with one another throughout the length of the watercourse within the survey area.

Stream N-S2 – Porcupine Brook

Porcupine Brook is a riverine lower perennial stream with a mud substrate (R2UB3). The brook flows into the northeastern portion of the survey area from the east and is channelized in-between the I-93 corridor and a self-storage facility. The watercourse eventually flows to a pond created by damming the brook at the northern end of the survey area. The brook averages 40 feet wide throughout the survey area and varies in depth from several inches to several feet. Ordinary high water and top-of-bank coincide with one another throughout the length of the watercourse within the survey area.

Stream N-S3 – Spickett River

The Spickett River is a riverine lower perennial stream with a mud substrate (R2UB3). Within the project area, it flows from its confluence with Policy Brook to Hampshire Road in Massachusetts. The brook averages 30 feet wide throughout the survey area and varies in depth from several inches to several feet. Ordinary high water and top-of-bank coincide with one another throughout the length of the watercourse within the survey area.

Stream S-S1 – Harris Brook tributary

The Harris Brook tributary is a riverine lower perennial stream with a mud substrate (R2UB3) which begins in the southern portion of the survey area and flows southward, parallel to the I-93 corridor, for approximately 3,700 feet to where it transitions to a wetland. The brook at its headwaters averages 6 feet wide, gaining toward the south and increasing in width and depth from several inches to several feet. Ordinary high water and top-of-bank coincide with one another throughout the length of the watercourse within the survey area.

Stream S-S2

Stream S-S2 is an unnamed intermittent stream with a mud substrate (R4SB5). The stream is embedded within wetland S3 and is connected to the Harris Brook tributary (S-S3). The stream is approximately 3-4 feet in width and had a water depth of approximately one inch at the time of the survey.

Stream S-S3

Stream S-S3 is an unnamed intermittent stream with a mud substrate (R4SB5). It is hydrologically connected to both wetland S9 and the Harris Brook tributary. On June 28th it was observed to contain ~ 1 inch water depth with a shallow channel ~ 3-4 feet wide.

Stream S-S4

Stream S-S4 is an unnamed intermittent stream with a mud substrate (R4SB5). It runs through wetlands S20, M12, M10, M9, and presumably empties into Porcupine Brook via a culvert. (The stream is connected to the wetlands via culverts under I-93.) Where it traverses wetland S20 the stream is approximately 3-4 feet in width and had a water depth of approximately one to 6 inches at the time of the survey (summer 2017). In wetland M12 the stream has been dammed by beavers. The stream then continues beyond the dam traversing wetlands M10 and M9.

3.7 Non-Jurisdictional Drainages (Scoured Channels)

A total of 16 scoured channels were delineated within the survey area. N-SC1 and N-SC2 drain from culverts to Policy Brook. N-SC3 drains from a culvert to wetland N6. N-SC4 drains into the Spickett River at the Hampshire Road culvert. N-SC5, N-SC6, N-SC7, and N-SC8, N-SC9, and N-SC10 drain from culverts to Porcupine Brook. M-SC1 connects one culvert to another in the highway median. M-SC2 drains wetland M1 to the same culvert that M-SC1 drains to. M-SC3 drains wetland M4. M-SC4 drains from a culvert to wetland M10. S-SC1 drains from outside the survey area to the west to the Harris Brook tributary. S-SC2 connects a culvert on the side of I-93 to wetland S16.

4.0 Invasive Species

Nine species of non-native invasive species were observed throughout the survey area. **Glossy false buckthorn was the most common encountered invasive species; the species is not reflected on delineation maps due to its prominence throughout the entire survey area.** All other observed non-native, invasive plant species were geo-located (64 points total) and hence appear on delineation maps.

With the exception of the PEM section of wetland S20, purple loosestrife was found not in dense colonies, but rather sparsely located throughout the area, with individual specimens generally not being very robust. This is due undoubtedly to predation by black-margined loosestrife beetle larvae (*Galerucella californiensis*) released as a biological control agent.

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DELINEATION MAPS



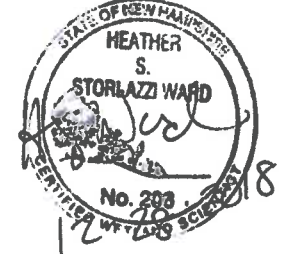
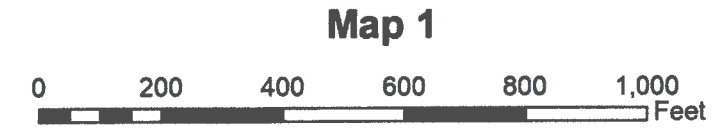
KEY TO NON-NATIVE, INVASIVE PLANT CODES*
 BETH = Japanese barberry
 CEOR = Asian bittersweet
 ELUM = Autumn olive
 FAJA = Japanese knotweed
 FRAL = Glossy false buckthorn
 LOMO = Morrow's honeysuckle
 LYSA = Purple loosestrife
 PHAU = Common reed
 ROMU = Multiflora rose
 *Glossy false buckthorn is present throughout the entire survey area.

KEY TO WETLAND CLASSIFICATION CODES. NJDA = Non-Jurisdictional Drainage Area
 PUB = Palustrine Unconsolidated Bottom
 PEM = Palustrine Emergent
 PFO = Palustrine Forested
 PSS = Palustrine Scrub-Shrub
 1 = Persistent
 C = Seasonally flooded
 E = Seasonally flooded/saturated
 F = Semipermanently flooded
 H = Permanently Flooded
 J = Intermittently flooded
 h = Diked/Impounded
 x = Excavated

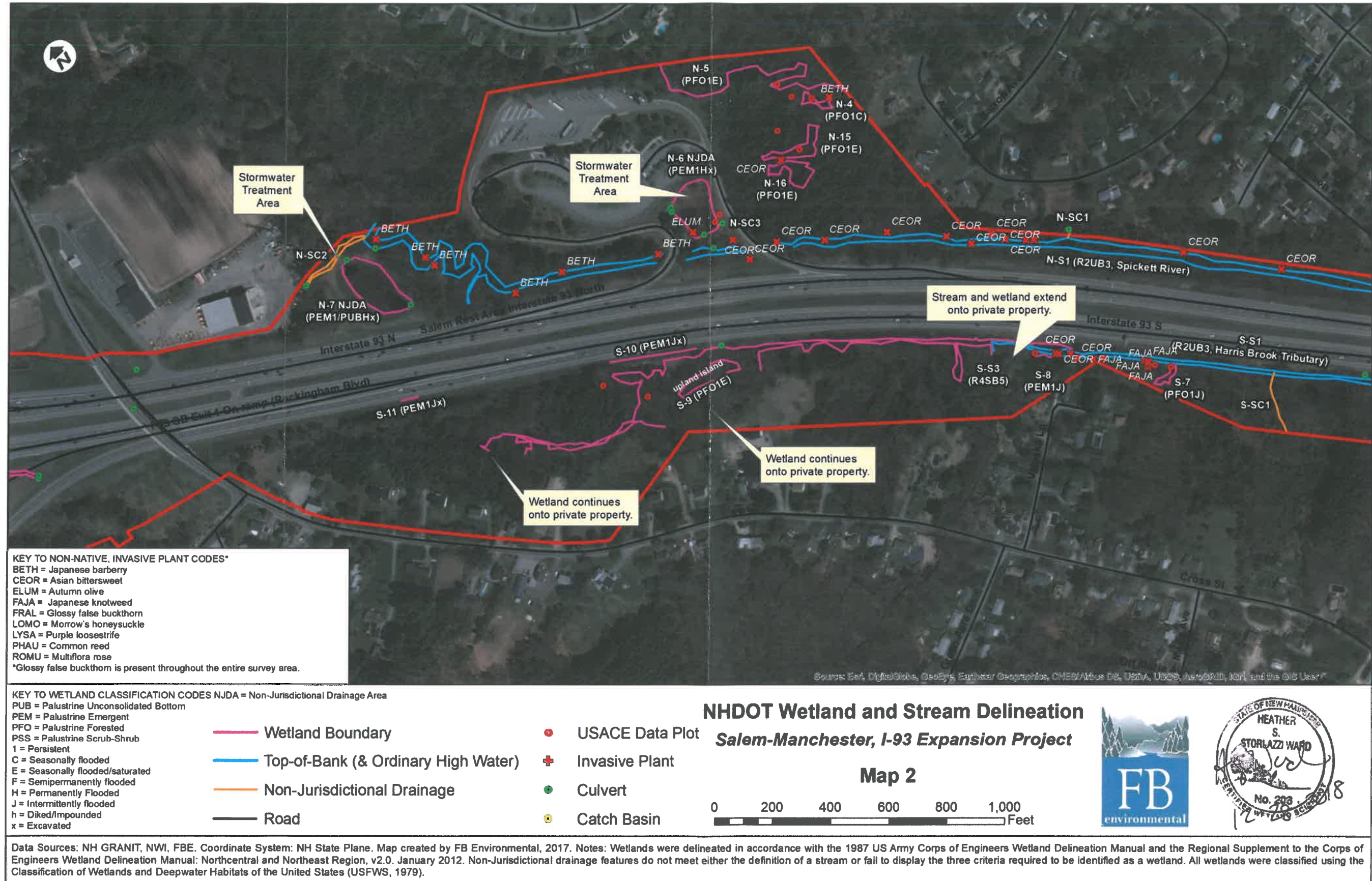
- Wetland Boundary
- Top-of-Bank (& Ordinary High Water)
- Non-Jurisdictional Drainage
- Road

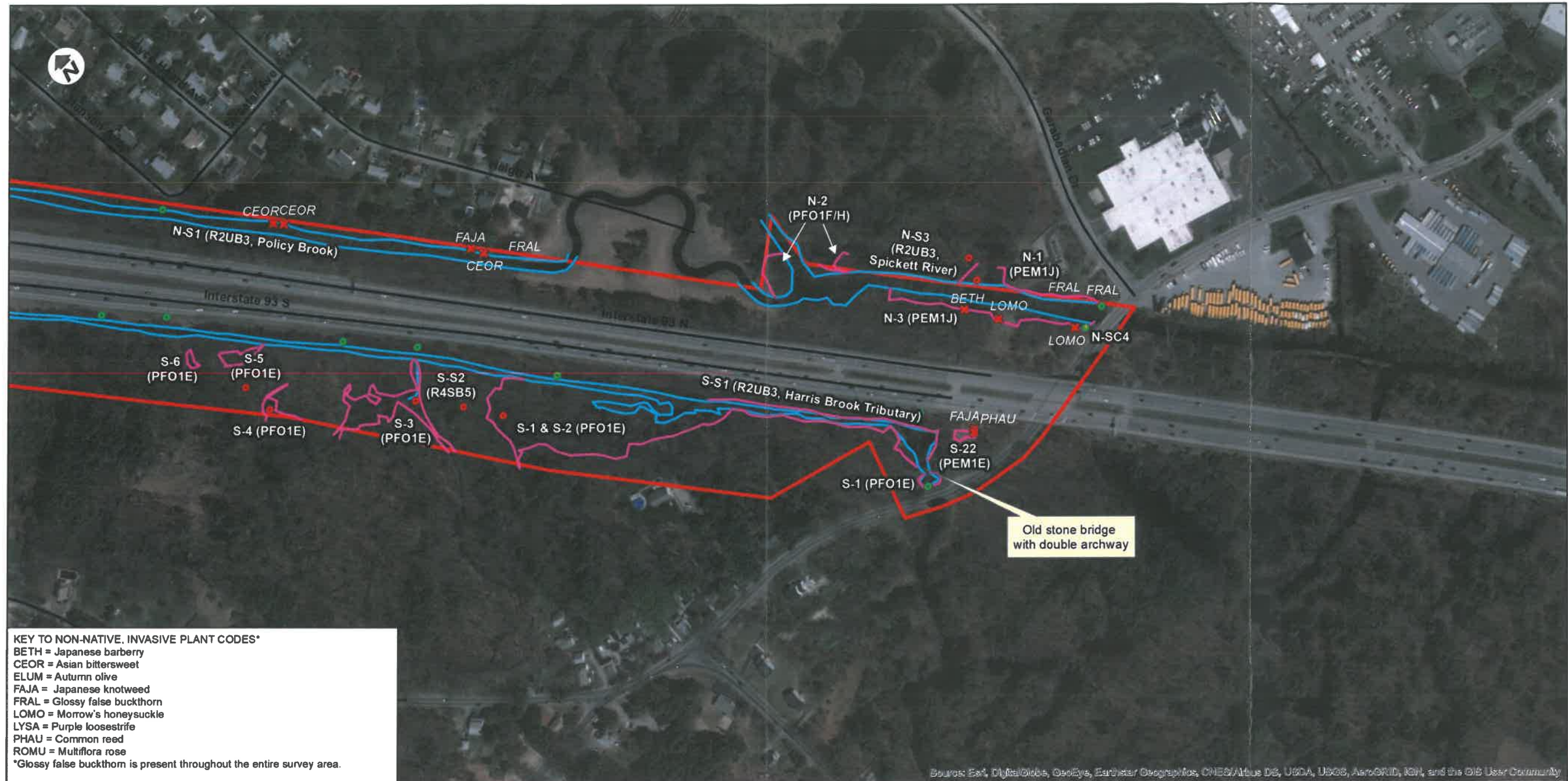
- USACE Data Plot
- + Invasive Plant
- Culvert
- Catch Basin

NHDOT Wetland and Stream Delineation
Salem-Manchester, I-93 Expansion Project



Data Sources: NH GRANIT, NWI, FBE. Coordinate System: NH State Plane. Map created by FB Environmental, 2017. Notes: Wetlands were delineated in accordance with the 1987 US Army Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, v2.0. January 2012. Non-Jurisdictional drainage features do not meet either the definition of a stream or fail to display the three criteria required to be identified as a wetland. All wetlands were classified using the Classification of Wetlands and Deepwater Habitats of the United States (USFWS, 1979).



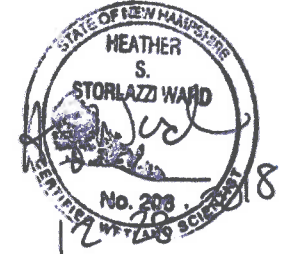
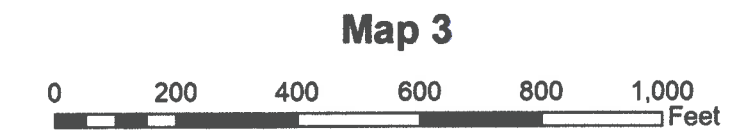


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APPENDICES

APPENDIX A. Wetland Photographs



Photo 1. Wetland N-1 is a riparian wetland associated with the Spickett River.



Photo 2. Wetland N-2 contains an oxbow of the Spickett River.



Photo 3. The inlet/outlet of Wetland N-2 to the Spickett River.



Photo 4. Wetland N-3 is a riparian wetland associated with the Spickett River.



Photo 5. Wetland N-4 is a potential vernal pool.



Photo 6. Wetland N-5 is a riparian system associated with Policy Brook.



Photo 7. Wetland N-6 is a stormwater retention pond.



Photo 8. Wetland N-7 is a stormwater retention pond.



Photo 9. Wetland N-8 is a roadside ditch.



Photo 10. Wetland N-9 is forested wetland in-between I-93 and a residence.



Photo 11. Wetland N-10 is a riparian system associated with Porcupine Brook.



Photo 12. Wetland N-11 is a riparian system associated with Porcupine Brook.



Photo 13. Wetland N-12 is a riparian wetland associated with Porcupine Brook.



Photo 14. Wetland N-13 is a riparian wetland associated with Porcupine Brook.



Photo 15. Wetland N-14 is a riparian wetland associated with Porcupine Brook.



Photo 16. Wetland N-15 is a forested wetland near the rest area.



Photo 17. Wetland N-16 is a forested wetland near the rest area.



Photo 18. Wetland M-1 is forested wetland in the highway median.



Photo 19. Wetland M-2 is forested wetland in the highway median.



Photo 20. Wetland M-3 is forested wetland in the highway median.



Photo 21. Wetland M-4 is a constructed stormwater treatment wetland on the side of I-93.



Photo 22. Wetland M-5 is a constructed stormwater treatment wetland on the side of I-93.



Photo 23. Wetland M-6 is a roadside ditch.



Photo 24. Wetland M-7 is a constructed stormwater treatment wetland in the highway median.



Photo 25. Wetland M-8 is a retention pond.



Photo 26. Wetland M-9 is a constructed stormwater treatment wetland.



Photo 27. Wetland M-10 is a constructed stormwater treatment wetland.



Photo 28. Wetland M-11 is a roadside ditch.



Photo 29. The constructed emergent marsh portion of wetland M-12.



Photo 30. The natural forested portion of wetland M12.



Photo 31. Wetland M-13 is a roadside ditch.



Photo 32. Wetland S-1 is a riparian wetland associated with the Harris Brook tributary.



Photo 33. Wetland S-2 is a small forested wetland.



Photo 34. Wetland S-3 is a forested wetland which contains Stream S-S2.



Photo 35. Wetland S-4 is a forested wetland complex which extends beyond the survey area.



Photo 36. Wetland S-5 is a small forested wetland.



Photo 37. Wetland S-6 is a small forested wetland.



Photo 38. Wetland S-7 is a forested wetland connected to the Harris Brook tributary.



Photo 39. Wetland S-8 is a scrub-shrub wetland.



Photo 40. Wetland S-9 is a large forested wetland complex.



Photo 41. Wetland S-10 is a roadside ditch.



Photo 42. Wetland S12 is a stormwater treatment wetland.



Photo 43. Wetland S-15 is a stormwater treatment wetland.



Photo 44. Wetland S-16 stormwater treatment wetland.



Photo 45. Wetland S-17 is a forested wetland complex with potential vernal pools.



Photo 46. Wetland S-18 is a forested wetland complex with potential vernal pools.



Photo 47. Wetland S-20 is large wetland complex.



Photo 48. Wetland S-21 is a forested wetland complex.

APPENDIX B. Stream Photographs



Photo 49. Policy Brook (Stream N-S1) is channelized throughout much of the survey area.



Photo 50. Porcupine Brook (Stream N-S2) is dammed to form a pond, wetland N-17.



Photo 51. The Spickett River (Stream N-S3) from wetland N1.



Photo 52. The typical character of the Harris Brook tributary (Stream S-S1).



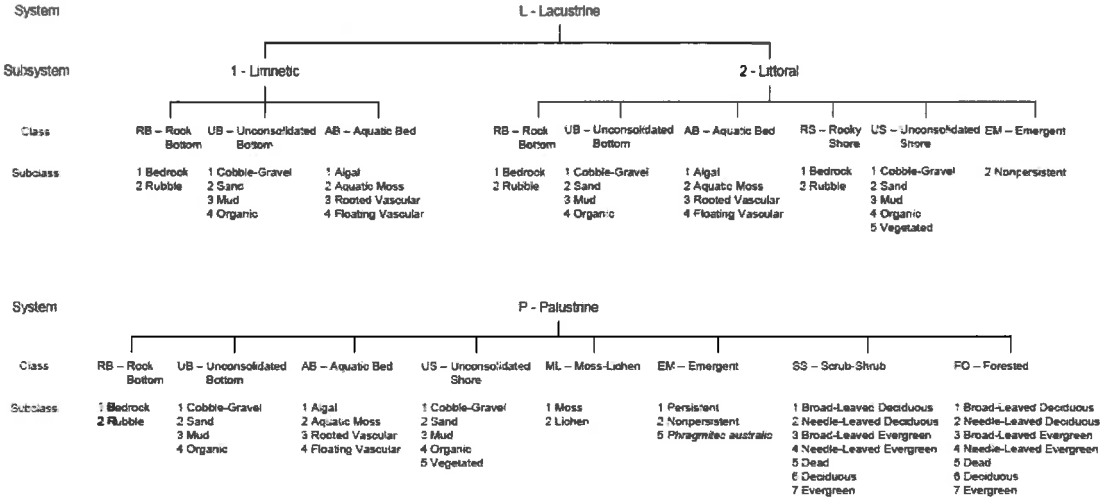
Photo 53. Typical character of streams S-S2 and S-S3.



Photo 54. Stream S-S4 traverses wetland S20.

APPENDIX C. Cowardin Wetland Classification System

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION



MODIFIERS							
In order to more adequately describe the wetland and deepwater habitats, one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The former modifier may also be applied to the ecological system.							
Water Regime			Special Modifiers	Water Chemistry			Soil
Nontidal	Saltwater Tidal	Freshwater Tidal		Coastal Salinity	Inland Salinity	pH Modifiers for all Fresh Water	
A Temporarily Flooded	L Subtidal	S Temporarily Flooded-Tidal	b Beaver	1 Hypersaline	7 Hypersaline	a Acid	g Organic
B Saturated	M Irregularly Exposed	R Seasonally Flooded-Tidal	d Partly Drained/Ditched	2 Euhaline	8 Eusaline	t Circumneutral	n Mineral
C Seasonally Flooded	N Regularly Flooded	T Semipermanently Flooded-Tidal	f Farmed	3 Mesohaline (Brackish)	9 Mesosaline	i Alkaline	
E Seasonally Flooded/Saturated	P Irregularly Flooded	V Permanently Flooded-Tidal	h Diked/Impounded	4 Polyhaline	0 Fresh		
F Semipermanently Flooded			r Artificial	5 Mesohaline			
G Intermittently Exposed			s Spoil	6 Oligohaline			
H Permanently Flooded			x Excavated	0 Fresh			
J Intermittently Flooded							
K Artificially Flooded							

APPENDIX D. Wetland Functional Assessment Criteria

Appendix A

Wetland evaluation supporting documentation; Reproducible forms.

Below is an example list of considerations that was used for a New Hampshire highway project. Considerations are flexible, based on best professional judgment and interdisciplinary team consensus. This example provides a comprehensive base, however, and may only need slight modifications for use in other projects.



GROUNDWATER RECHARGE/DISCHARGE— This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

CONSIDERATIONS/QUALIFIERS

1. Public or private wells occur downstream of the wetland.
2. Potential exists for public or private wells downstream of the wetland.
3. Wetland is underlain by stratified drift.
4. Gravel or sandy soils present in or adjacent to the wetland.
5. Fragipan does not occur in the wetland.
6. Fragipan, impervious soils, or bedrock does occur in the wetland.
7. Wetland is associated with a perennial or intermittent watercourse.
8. Signs of groundwater recharge are present or piezometer data demonstrates recharge.
9. Wetland is associated with a watercourse but lacks a defined outlet or contains a constricted outlet.
10. Wetland contains only an outlet, no inlet.
11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.
12. Quality of water associated with the wetland is high.
13. Signs of groundwater discharge are present (e.g., springs).
14. Water temperature suggests it is a discharge site.
15. Wetland shows signs of variable water levels.
16. Piezometer data demonstrates discharge.
17. Other



FLOODFLOW ALTERATION (Storage & Desynchronization) — This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

CONSIDERATIONS/QUALIFIERS

1. Area of this wetland is large relative to its watershed.
2. Wetland occurs in the upper portions of its watershed.
3. Effective flood storage is small or non-existent upslope of or above the wetland.
4. Wetland watershed contains a high percent of impervious surfaces.
5. Wetland contains hydric soils which are able to absorb and detain water.
6. Wetland exists in a relatively flat area that has flood storage potential.
7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level.
8. During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions.
9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands.
10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse.
11. Valuable properties, structures, or resources are located in or near the floodplain downstream from the wetland.
12. The watershed has a history of economic loss due to flooding.
13. This wetland is associated with one or more watercourses.
14. This wetland watercourse is sinuous or diffuse.
15. This wetland outlet is constricted.
16. Channel flow velocity is affected by this wetland.
17. Land uses downstream are protected by this wetland.
18. This wetland contains a high density of vegetation.
19. Other

FISH AND SHELLFISH HABITAT (FRESHWATER) — This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in question for fish and shellfish habitat.



CONSIDERATIONS/QUALIFIERS

1. Forest land dominant in the watershed above this wetland.
 2. Abundance of cover objects present.
- STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE**
3. Size of this wetland is able to support large fish/shellfish populations.
 4. Wetland is part of a larger, contiguous watercourse.
 5. Wetland has sufficient size and depth in open water areas so as not to freeze solid and retain some open water during winter.
 6. Stream width (bank to bank) is more than 50 feet.
 7. Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations.
 8. Streamside vegetation provides shade for the watercourse.
 9. Spawning areas are present (submerged vegetation or gravel beds).
 10. Food is available to fish/shellfish populations within this wetland.
 11. Barrier(s) to anadromous fish (such as dams, including beaver dams, waterfalls, road crossing) are absent from the stream reach associated with this wetland.
 12. Evidence of fish is present.
 13. Wetland is stocked with fish.
 14. The watercourse is persistent.
 15. Man-made streams are absent.
 16. Water velocities are not too excessive for fish usage.
 17. Defined stream channel is present.
 18. Other

Although the above example refers to freshwater wetlands, it can also be adapted for marine ecosystems. The following is an example provided by the National Marine Fisheries Service (NMFS) of an adaptation for the fish and shellfish function.

FISH AND SHELLFISH HABITAT (MARINE) — This function considers the effectiveness of wetlands, embayments, tidal flats, vegetated shallows, and other environments in supporting marine resources such as fish, shellfish, marine mammals, and sea turtles.

CONSIDERATIONS/QUALIFIERS

1. Special aquatic sites (tidal marsh, mud flats, eelgrass beds) are present.
2. Suitable spawning habitat is present at the site or in the area.
3. Commercially or recreationally important species are present or suitable habitat exists.
4. The wetland/waterway supports prey for higher trophic level marine organisms.
5. The waterway provides migratory habitat for anadromous fish.
6. Essential fish habitat, as defined by the 1996 amendments to the Magnuson-Stevens Fishery & Conservation Act, is present (consultation with NMFS may be necessary).
7. Other



SEDIMENT/TOXICANT/PATHOGEN RETENTION — This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands or upstream eroding wetland areas.

CONSIDERATIONS/QUALIFIERS

1. Potential sources of excess sediment are in the watershed above the wetland.
2. Potential or known sources of toxicants are in the watershed above the wetland.
3. Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland.
4. Fine grained mineral or organic soils are present.
5. Long duration water retention time is present in this wetland.
6. Public or private water sources occur downstream.
7. The wetland edge is broad and intermittently aerobic.
8. The wetland is known to have existed for more than 50 years.
9. Drainage ditches have not been constructed in the wetland.

STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.

10. Wetland is associated with an intermittent or perennial stream or a lake.
11. Channelized flows have visible velocity decreases in the wetland.
12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present.
13. No indicators of erosive forces are present. No high water velocities are present.
14. Diffuse water flows are present in the wetland.
15. Wetland has a high degree of water and vegetation interspersion.
16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation by dense vegetation is present.
17. Other



NUTRIENT REMOVAL/RETENTION/TRANSFORMATION — This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries.

CONSIDERATIONS/QUALIFIERS

1. Wetland is large relative to the size of its watershed.
2. Deep water or open water habitat exists.
3. Overall potential for sediment trapping exists in the wetland.

4. Potential sources of excess nutrients are present in the watershed above the wetland.
 5. Wetland saturated for most of the season. Pondered water is present in the wetland.
 6. Deep organic/sediment deposits are present.
 7. Slowly drained fine grained mineral or organic soils are present.
 8. Dense vegetation is present.
 9. Emergent vegetation and/or dense woody stems are dominant.
 10. Opportunity for nutrient attenuation exists.
 11. Vegetation diversity/abundance sufficient to utilize nutrients.
- STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.
12. Waterflow through this wetland is diffuse.
 13. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation.
 14. Water moves slowly through this wetland.
 15. Other

PRODUCTION EXPORT (Nutrient) — This function evaluates the effectiveness of the wetland to produce food or usable products for humans or other living organisms.



CONSIDERATIONS/QUALIFIERS

1. Wildlife food sources grow within this wetland.
2. Detritus development is present within this wetland
3. Economically or commercially used products found in this wetland.
4. Evidence of wildlife use found within this wetland.
5. Higher trophic level consumers are utilizing this wetland.
6. Fish or shellfish develop or occur in this wetland.
7. High vegetation density is present.
8. Wetland exhibits high degree of plant community structure/species diversity.
9. High aquatic vegetative diversity/abundance is present.
10. Nutrients exported in wetland watercourses (permanent outlet present).
11. “Flushing” of relatively large amounts of organic plant material occurs from this wetland.
12. Wetland contains flowering plants that are used by nectar-gathering insects.
13. Indications of export are present.
14. High production levels occurring, however, no visible signs of export (assumes export is attenuated).
15. Other

SEDIMENT/ShORELINE STABILIZATION — This function considers the effectiveness of a wetland to stabilize streambanks and shorelines against erosion.



CONSIDERATIONS/QUALIFIERS

1. Indications of erosion or siltation are present.
2. Topographical gradient is present in wetland.
3. Potential sediment sources are present up-slope.
4. Potential sediment sources are present upstream.
5. No distinct shoreline or bank is evident between the waterbody and the wetland or upland.
6. A distinct step between the open waterbody or stream and the adjacent land exists (i.e., sharp bank) with dense roots throughout.
7. Wide wetland (>10’) borders watercourse, lake, or pond.
8. High flow velocities in the wetland.
9. The watershed is of sufficient size to produce channelized flow.
10. Open water fetch is present.
11. Boating activity is present.
12. Dense vegetation is bordering watercourse, lake, or pond.
13. High percentage of energy-absorbing emergents and/or shrubs border a watercourse, lake, or pond.
14. Vegetation is comprised of large trees and shrubs that withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet).
15. Vegetation is comprised of a dense resilient herbaceous layer that stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events.



WILDLIFE HABITAT — This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species must be considered. Species lists of observed and potential animals should be included in the wetland assessment report.¹

CONSIDERATIONS/QUALIFIERS

1. Wetland is not degraded by human activity.
2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards.
3. Wetland is not fragmented by development.
4. Upland surrounding this wetland is undeveloped.
5. More than 40% of this wetland edge is bordered by upland wildlife habitat (e.g., brushland, woodland, active farmland, or idle land) at least 500 feet in width.
6. Wetland is contiguous with other wetland systems connected by a watercourse or lake.
7. Wildlife overland access to other wetlands is present.
8. Wildlife food sources are within this wetland or are nearby.
9. Wetland exhibits a high degree of interspersion of vegetation classes and/or open water.
10. Two or more islands or inclusions of upland within the wetland are present.
11. Dominant wetland class includes deep or shallow marsh or wooded swamp.
12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland, are present.
13. Density of the wetland vegetation is high.
14. Wetland exhibits a high degree of plant species diversity.
15. Wetland exhibits a high degree of diversity in plant community structure (e.g., tree/shrub/vine/grasses/mosses)
16. Plant/animal indicator species are present. (List species for project)
17. Animal signs observed (tracks, scats, nesting areas, etc.)
18. Seasonal uses vary for wildlife and wetland appears to support varied population diversity/abundance during different seasons.
19. Wetland contains or has potential to contain a high population of insects.
20. Wetland contains or has potential to contain large amphibian populations.
21. Wetland has a high avian utilization or its potential.
22. Indications of less disturbance-tolerant species are present.
23. Signs of wildlife habitat enhancement are present (birdhouses, nesting boxes, food sources, etc.).
24. Other

¹In March 1995, a rapid wildlife habitat assessment method was completed by a University of Massachusetts research team with funding and oversight provided by the New England Transportation Consortium. The method is called WEThings (wetland habitat indicators for non-game species). It produces a list of potential wetland-dependent mammal, reptile, and amphibian species that may be present in the wetland. The output is based on observable habitat characteristics documented on the field data form. This method may be used to generate the wildlife species list recommended as backup information to the wetland evaluation form and to augment the considerations. Use of this method should first be coordinated with the Corps project manager. A computer program is also available to expedite this process.

RECREATION (Consumptive and Non-Consumptive) — This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting, and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland. Non-consumptive opportunities do not consume or diminish these resources of the wetland.



CONSIDERATIONS/QUALIFIERS

1. Wetland is part of a recreation area, park, forest, or refuge.
2. Fishing is available within or from the wetland.
3. Hunting is permitted in the wetland.
4. Hiking occurs or has potential to occur within the wetland.
5. Wetland is a valuable wildlife habitat.
6. The watercourse, pond, or lake associated with the wetland is unpolluted.
7. High visual/aesthetic quality of this potential recreation site.
8. Access to water is available at this potential recreation site for boating, canoeing, or fishing.
9. The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating.
10. Off-road public parking available at the potential recreation site.
11. Accessibility and travel ease is present at this site.
12. The wetland is within a short drive or safe walk from highly populated public and private areas.
13. Other

EDUCATIONAL/SCIENTIFIC VALUE — This value considers the suitability of the wetland as a site for an “outdoor classroom” or as a location for scientific study or research.



CONSIDERATIONS/QUALIFIERS

1. Wetland contains or is known to contain threatened, rare, or endangered species.
2. Little or no disturbance is occurring in this wetland.
3. Potential educational site contains a diversity of wetland classes which are accessible or potentially accessible.
4. Potential educational site is undisturbed and natural.
5. Wetland is considered to be a valuable wildlife habitat.
6. Wetland is located within a nature preserve or wildlife management area.
7. Signs of wildlife habitat enhancement present (bird houses, nesting boxes, food sources, etc.).
8. Off-road parking at potential educational site suitable for school bus access in or near wetland.
9. Potential educational site is within safe walking distance or a short drive to schools.
10. Potential educational site is within safe walking distance to other plant communities.
11. Direct access to perennial stream at potential educational site is available.
12. Direct access to pond or lake at potential educational site is available.
13. No known safety hazards exist within the potential educational site.
14. Public access to the potential educational site is controlled.
15. Handicap accessibility is available.
16. Site is currently used for educational or scientific purposes.
17. Other



UNIQUENESS/HERITAGE — This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values. These may include archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location. These functions are clearly valuable wetland attributes relative to aspects of public health, recreation, and habitat diversity.

CONSIDERATIONS/QUALIFIERS

1. Upland surrounding wetland is primarily urban.
2. Upland surrounding wetland is developing rapidly.
3. More than 3 acres of shallow permanent open water (less than 6.6 feet deep), including streams, occur in wetlands.
4. Three or more wetland classes are present.
5. Deep and/or shallow marsh or wooded swamp dominate.
6. High degree of interspersion of vegetation and/or open water occur in this wetland.
7. Well-vegetated stream corridor (15 feet on each side of the stream) occurs in this wetland.
8. Potential educational site is within a short drive or a safe walk from schools.
9. Off-road parking at potential educational site is suitable for school buses.
10. No known safety hazards exist within this potential educational site.
11. Direct access to perennial stream or lake exists at potential educational site.
12. Two or more wetland classes are visible from primary viewing locations.
13. Low-growing wetlands (marshes, scrub-shrub, bogs, open water) are visible from primary viewing locations.
14. Half an acre of open water or 200 feet of stream is visible from the primary viewing locations.
15. Large area of wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons.
16. General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed.
17. Overall view of the wetland is available from the surrounding upland.
18. Quality of the water associated with the wetland is high.
19. Opportunities for wildlife observations are available.
20. Historical buildings are found within the wetland.
21. Presence of pond or pond site and remains of a dam occur within the wetland.
22. Wetland is within 50 yards of the nearest perennial watercourse.
23. Visible stone or earthen foundations, berms, dams, standing structures, or associated features occur within the wetland.
24. Wetland contains critical habitat for a state- or federally-listed threatened or endangered species.
25. Wetland is known to be a study site for scientific research.
26. Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community.
27. Wetland has local significance because it serves several functional values.
28. Wetland has local significance because it has biological, geological, or other features that are locally rare or unique.
29. Wetland is known to contain an important archaeological site.
30. Wetland is hydrologically connected to a state or federally designated scenic river.
31. Wetland is located in an area experiencing a high wetland loss rate.
32. Other

VISUAL QUALITY/AESTHETICS — This value considers the visual and aesthetic quality or usefulness of the wetland.



CONSIDERATIONS/QUALIFIERS

1. Multiple wetland classes are visible from primary viewing locations.
2. Emergent marsh and/or open water are visible from primary viewing locations.
3. A diversity of vegetative species is visible from primary viewing locations.
4. Wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons.
5. Land use surrounding the wetland is undeveloped as seen from primary viewing locations.
6. Visible surrounding land use form contrasts with wetland.
7. Wetland views absent of trash, debris, and signs of disturbance.
8. Wetland is considered to be a valuable wildlife habitat.
9. Wetland is easily accessed.
10. Low noise level at primary viewing locations.
11. Unpleasant odors absent at primary viewing locations.
12. Relatively unobstructed sight line exists through wetland.
13. Other

ENDANGERED SPECIES HABITAT — This value considers the suitability of the wetland to support threatened or endangered species.

ES

CONSIDERATIONS/QUALIFIERS

1. Wetland contains or is known to contain threatened or endangered species.
2. Wetland contains critical habitat for a state or federally listed threatened or endangered species.

APPENDIX E. Completed Wetland Functional Assessment Forms

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? N Is wetland part of a wildlife corridor? Y or a "habitat island"? _____
 Adjacent land use Interstate Distance to nearest roadway or other development 100'
 Dominant wetland systems present Riparian PEM Contiguous undeveloped buffer zone present NO
 Is the wetland a separate hydraulic system? NO If not, where does the wetland lie in the drainage basin? Floodplain
 How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. N1, N2, N3
 Latitude _____ Longitude _____
 Prepared by: KR/LD Date 2 Aug 17
 Wetland Impact:
 Type _____ Area _____
 Evaluation based on:
 Office _____ Field X
 Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	4,7,15		1 st order gaining river. Typical hydrology
Floodflow Alteration	Y	2,5,6,9,13,14,18	X	Geomorph. consists of mult. backchannels along floodplain
Fish and Shellfish Habitat	Y	1,4,8,10,12,24,27		Small fish (Cyprinidae?) observed in river
Sediment/Toxicant Retention	Y	1 ⁶ 1,2,3,4,5,8,10,11,12,15	X	Densely vegetated floodplain suggest good retention
Nutrient Removal	Y	3,4,6,7,8,9,10,11,14	X	Densely vegetated floodplain = uptake of nitrogen & phosphorus
Production Export	Y	3,2,4,5,6,7,13	X	Provides food to numerous species
Sediment/Shoreline Stabilization	Y	1,3,4,7,9,10,12,13,14,15	X	Dense vegetation traps sediment no erosion visible
Wildlife Habitat	Y	7,8,13,15,16,17,19		observed <u>Rana palustris</u> and deer trails
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	Y	24	X	<u>Betula nigra</u> present in wetland
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? Y Is wetland part of a wildlife corridor? N or a "habitat island"? _____

Adjacent land use Residential/Interstate Rest Stop Distance to nearest roadway or other development ~100'

Dominant wetland systems present PFO1 Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? —

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. N4

Latitude _____ Longitude _____

Prepared by: KB, CD Date 7 Aug 2013

Wetland Impact:
Type _____ Area _____

Evaluation based on:

Office _____ Field X

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	3,4,1		
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1,2,4		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	7,8,18,20	X	May contain vernal pool amphibians in Spring
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes: Wetland is a potential vernal pool

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? N Is wetland part of a wildlife corridor? Y or a "habitat island"? -

Adjacent land use Residential/Interstate roadways Distance to nearest roadway or other development ~50

Dominant wetland systems present PFO1 Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? N If not, where does the wetland lie in the drainage basin? -

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. N5

Latitude _____ Longitude _____

Prepared by: KRCO Date 2 Aug 2017

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	3,4		
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1,2,4,7		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	7,8,16,17,18	X	VPanthers might breed in wetland
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? Y Is wetland part of a wildlife corridor? N or a "habitat island"? N
 Adjacent land use Interstate Rest Area Distance to nearest roadway or other development ~30'
 Dominant wetland systems present PEM1 Contiguous undeveloped buffer zone present N
 Is the wetland a separate hydraulic system? N If not, where does the wetland lie in the drainage basin? Isolated
 How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. N6
 Latitude _____ Longitude _____
 Prepared by: KLGD Date 2 Aug 2017
 Wetland Impact:
 Type _____ Area _____
 Evaluation based on:
 Office _____ Field X
 Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	15		Wetland is for stormwater treatment/retention
Floodflow Alteration	Y	3, 4, 5, 7, 9, 11, 13	X	↓
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	2, 3, 4, 5, 10, 13,	X	Densely vegetated
Nutrient Removal	Y	13, 14 1, 3, 4, 5, 7, 8, 9, 10, 11	X	Densely vegetated
Production Export	Y	4		Observed red-winged blackbirds
Sediment/Shoreline Stabilization	Y	2		
Wildlife Habitat	N			
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes: Wetland drains to Polly Branch but is not within its riparian zone * Refer to backup list of numbered considerations.
 wetland is a constructed stormwater treatment area.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? N Is wetland part of a wildlife corridor? - or a "habitat island"? -
 Adjacent land use Highway/Residential Distance to nearest roadway or other development ~10'
 Dominant wetland systems present PFO Contiguous undeveloped buffer zone present No
 Is the wetland a separate hydraulic system? YES If not, where does the wetland lie in the drainage basin? -
 How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. N9
 Latitude _____ Longitude _____
 Prepared by: KRC Date 9/11/19
 Wetland Impact:
 Type _____ Area _____
 Evaluation based on:
 Office _____ Field X
 Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	8, 15		
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 2, 4,	X	
Nutrient Removal	Y	3, 4, 7, 10	X	
Production Export	N			
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	N			
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"?

Adjacent land use Commercial/Highway Distance to nearest roadway or other development ~25'

Dominant wetland systems present PEM Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Floodplain

How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. N12

Latitude _____ Longitude _____

Prepared by: KB, CO Date 9/11/17

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y/N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	7, 13, 15		
Floodflow Alteration	Y	2, 4, 6, 7, 8, 9, 10, 13,	X	
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 2, 3, 5, 10, 12, 13, 15	X	
Nutrient Removal	Y	2, 3, 4, 5, 10, 14	X	
Production Export	Y	1, 2, 4, 5, 9		
Sediment/Shoreline Stabilization	Y	2, 3, 4, 10, 12, 13, 15		
Wildlife Habitat	Y	8, 9, 11, 12, 16, 19		
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? N Is wetland part of a wildlife corridor? _____ or a "habitat island"? _____

Adjacent land use Residential/Interstate Rest Area Distance to nearest roadway or other development ~50

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present _____

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? _____

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. N15

Latitude _____ Longitude _____

Prepared by: KR, CD Date 2 Aug. 2017

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	3,4	X	
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1,2,4,7	X	
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	7,8,16,17,18	X	Observed deer tracks
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland _____ Human made? No Is wetland part of a wildlife corridor? _____ or a "habitat island"? X

Adjacent land use Interstate Highway Distance to nearest roadway or other development ~30'

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? -

How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. M3, M2, M1
 Latitude _____ Longitude _____
 Prepared by: KP, CD Date 28 August 17
 Wetland Impact:
 Type _____ Area _____
 Evaluation based on:
 Office _____ Field X
 Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	4,8,		
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1,2,5,		
Nutrient Removal	Y	3,4,5,10,	X	
Production Export	N			
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	N			
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes: Potential vernal pool in highway median

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? Y Is wetland part of a wildlife corridor? _____ or a "habitat island"?

Adjacent land use Highway Distance to nearest roadway or other development 0'

Dominant wetland systems present PEM1 Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? _____

How many tributaries contribute to the wetland? _____ Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. M10

Latitude _____ Longitude _____

Prepared by: KACD Date 6/11/19

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field

Corps manual wetland delineation completed? Y N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1,2,	X	
Nutrient Removal	Y	3,4,9,10	X	
Production Export	N			
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	N			
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				













Notes: Wetland is a constructed stormwater treatment area. * Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland _____ Human made? no Is wetland part of a wildlife corridor? _____ or a "habitat island"? XAdjacent land use Highway Distance to nearest roadway or other development ~10'Dominant wetland systems present PFO Contiguous undeveloped buffer zone present NoIs the wetland a separate hydraulic system? X If not, where does the wetland lie in the drainage basin? _____How many tributaries contribute to the wetland? — Wildlife & vegetation diversity/abundance (see attached list)Wetland I.D. MIZ

Latitude _____ Longitude _____

Prepared by: KLLO Date 9/11/17Wetland Impact:
Type _____ Area _____Evaluation based on:
Office _____ Field XCorps manual wetland delineation
completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	Y	4,8,15		
 Floodflow Alteration	N			
 Fish and Shellfish Habitat	N			
 Sediment/Toxicant Retention	Y	1,2,4,5,7	X	
 Nutrient Removal	Y	3,4,5,7,8,9,10	X	
 Production Export	Y	1,2,7,8		
 Sediment/Shoreline Stabilization	N			
 Wildlife Habitat	Y	8,9,13		
 Recreation	N			
 Educational/Scientific Value	N			
 Uniqueness/Heritage	N			
 Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland _____ Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"?

Adjacent land use Highway/Residential Distance to nearest roadway or other development ~100'

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? -

How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. S2453

Latitude _____ Longitude _____

Prepared by: KR.C.D Date 9/11/17

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	7,8,9,13,		
Floodflow Alteration	Y	2,3,5,6,8,10,11,13,14,	X	Stream present within wetland
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1,4,7,		
Sediment/Shoreline Stabilization	Y	7,9,13,14,15		
Wildlife Habitat	Y	6,7,8,10,16,18,19	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland _____ Human made? N Is wetland part of a wildlife corridor? Y or a "habitat island"? _____

Adjacent land use Forest/Highway Distance to nearest roadway or other development ~100'

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Y If not, where does the wetland lie in the drainage basin? _____

How many tributaries contribute to the wetland? — Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. SZ

Latitude _____ Longitude _____

Prepared by: KR Date 9/18/17

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	3,4		
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1,2		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	N	7, 8, 18	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? N Is wetland part of a wildlife corridor? Y or a "habitat island"? _____

Adjacent land use Highway/Residential Distance to nearest roadway or other development ~100'

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Y If not, where does the wetland lie in the drainage basin? _____

How many tributaries contribute to the wetland? — Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. S4, S5, S6

Latitude _____ Longitude _____

Prepared by: KECO Date 9/11/13

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	8, 15	X	
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1, 2, 4,		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	7, 8, 16, 18, 19, 20	X	Wetland is a potential vernal pool
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? NO Is wetland part of a wildlife corridor? X or a "habitat island"?

Adjacent land use Residential/Highway Distance to nearest roadway or other development ~50'

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? N If not, where does the wetland lie in the drainage basin? -

How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. S7 108

Latitude _____ Longitude _____

Prepared by: KRCO Date 9/11/17

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	7, 9, 13, 15		
Floodflow Alteration	Y	2, 4, 5, 6, 7, 8, 9, 10, 13	X	
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 2, 3, 4, 5, 10, 11, 14, 16	X	
Nutrient Removal	Y	3, 4, 7, 10, 12, 14		
Production Export	Y	1, 4, 12,		
Sediment/Shoreline Stabilization	Y	1, 2, 3, 4, 13, 14, 15		
Wildlife Habitat	Y	6, 7, 8, 16, 19,		
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? No Is wetland part of a wildlife corridor? X or a "habitat island"? _____

Adjacent land use Residential/Highway Distance to nearest roadway or other development ~50'

Dominant wetland systems present PEM Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? _____

How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. S8

Latitude _____ Longitude _____

Prepared by: KR, CD Date 9/11/17

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	7, 9, 13, 15		
Floodflow Alteration	Y	2, 4, 5, 6, 7, 8, 9, 10, 13	X	
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 2, 3, 4, 5, 10, 11, 14, 16	X	
Nutrient Removal	Y	3, 4, 7, 10, 12, 14		
Production Export	Y	1, 4, 12		
Sediment/Shoreline Stabilization	Y	1, 2, 3, 4, 13, 14, 15		
Wildlife Habitat	Y	6, 7, 8, 16, 19		
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? No Is wetland part of a wildlife corridor? _____ or a "habitat island"? X

Adjacent land use Residential/Highway Distance to nearest roadway or other development ~50'

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present no

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? _____

How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. S9

Latitude _____ Longitude _____

Prepared by: K.R.C.D Date 9/11/17

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y/ N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	4, 8, 15		
Floodflow Alteration	Y	2, 4, 5, 6, 7, 8, 9, 10, 13	X	
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 2, 4, 5, 7, 10, 12, 13, 14	X	
Nutrient Removal	Y	3, 4, 7, 10, 11, 12, 13, 14	X	
Production Export	Y	1, 2, 4, 12,		
Sediment/Shoreline Stabilization	Y	3, 4, 14, 15		
Wildlife Habitat	Y	6, 7, 8, 16, 19		
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? Yes Is wetland part of a wildlife corridor? No or a "habitat island"? No
 Adjacent land use Residential/Interstate Hwy. Distance to nearest roadway or other development 0'
 Dominant wetland systems present PEM Contiguous undeveloped buffer zone present No
 Is the wetland a separate hydraulic system? X If not, where does the wetland lie in the drainage basin? -
 How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. S12
 Latitude _____ Longitude _____
 Prepared by: KELO Date 28 August 201
 Wetland Impact:
 Type _____ Area _____
 Evaluation based on:
 Office _____ Field X
 Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	1,2,8,15	X	
Floodflow Alteration	Y	1,2,4,5,6,7,9,11,		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1,2,3,4,5,6,	X	
Nutrient Removal	Y	1,2,3,4,5,6,7,9,10	X	
Production Export	Y	4,8		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	N			
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes: Wetland is a constructed wetland mitigation site.













* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland _____ Human made? No Is wetland part of a wildlife corridor? X or a "habitat island"? _____Adjacent land use Forest & Interstate Hwy. Distance to nearest roadway or other development ~175'Dominant wetland systems present PFO Contiguous undeveloped buffer zone present NoIs the wetland a separate hydraulic system? Y If not, where does the wetland lie in the drainage basin? -How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)Wetland I.D. S-17

Latitude _____ Longitude _____

Prepared by: KE, CD Date 28 Aug. '13Wetland Impact:
Type _____ Area _____Evaluation based on:
Office _____ Field XCorps manual wetland delineation
completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	Y	3, 4, 8, 15		
 Floodflow Alteration	N			
 Fish and Shellfish Habitat	N			
 Sediment/Toxicant Retention	N			
 Nutrient Removal	N			
 Production Export	Y	1, 2, 4,		
 Sediment/Shoreline Stabilization	N			
 Wildlife Habitat	Y	1, 3, 4, 7, 8, 9, 18, 20	X	Potential Vernal Pool
 Recreation	N			
 Educational/Scientific Value	N			
 Uniqueness/Heritage	N			
 Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes: Area disturbed by forest operation
recent

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? NO Is wetland part of a wildlife corridor? X or a "habitat island"? _____

Adjacent land use Forest & Interstate Hwy. Distance to nearest roadway or other development ~150'

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? -

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. S-18

Latitude _____ Longitude _____

Prepared by: KR, CD Date 28 Aug '17

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	3,4,8,15		
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1,2,4		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1,3,4,7,8,9,10,18,20	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes: Area disturbed by ¹forestry operation recent

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? N Is wetland part of a wildlife corridor? Yes or a "habitat island"? _____
 Adjacent land use Forest/Interstate Highway Distance to nearest roadway or other development ~150'
 Dominant wetland systems present PEM Contiguous undeveloped buffer zone present No
 Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? -
 How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. SZO
 Latitude _____ Longitude _____
 Prepared by: KRLO Date 28 Aug. 2017
 Wetland Impact:
 Type _____ Area _____
 Evaluation based on:
 Office _____ Field X
 Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	4, 7, 10, 15,	X	
Floodflow Alteration	Y	2, 3, 6, 6, 7, 9, 10, 13, 14,		
Fish and Shellfish Habitat	Y	1, 8, 10, 12, 17		
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1, 2, 4, 6, 7, 12,		
Sediment/Shoreline Stabilization	Y	7, 15		
Wildlife Habitat	Y	2, 3, 4, 6, 7, 8, 10, 18, 19		
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
Endangered Species Habitat	N			
Other				

Notes: PEM is dominated by Purple loosestrife

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? N Is wetland part of a wildlife corridor? Yes or a "habitat island"? _____

Adjacent land use Forest/Interstate Highway Distance to nearest roadway or other development ~150'

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? NO If not, where does the wetland lie in the drainage basin? -

How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. S20

Latitude _____ Longitude _____

Prepared by: KR, CD Date 28 Aug '17

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field X

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	3,7,8,15		
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1,2,4		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1,3,4,7,8,9,10,18,20	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? Altered Is wetland part of a wildlife corridor? X or a "habitat island"? _____
 Adjacent land use Interstate 93/Woods Distance to nearest roadway or other development ~75'
 Dominant wetland systems present PFO Contiguous undeveloped buffer zone present No
 Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? _____
 How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. S23
 Latitude _____ Longitude _____
 Prepared by: KE, CO Date 28 Aug 17
 Wetland Impact:
 Type _____ Area _____
 Evaluation based on:
 Office _____ Field X
 Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	8, 15,		
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1, 2, 4, 7	X	
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	4, 7, 8, 9,	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes: Area likely impacted by S-SCZ excavation

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Appendix K

Total area of wetland _____ Human made? NO Is wetland part of a wildlife corridor? X or a "habitat island"? _____
 Adjacent land use woods / Interstate highway Distance to nearest roadway or other development ~30'
 Dominant wetland systems present PFO Contiguous undeveloped buffer zone present NO
 Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? -
 How many tributaries contribute to the wetland? - Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. SZ4
 Latitude _____ Longitude _____
 Prepared by: KR, CD Date 28 Aug '17
 Wetland Impact:
 Type _____ Area _____
 Evaluation based on:
 Office _____ Field X
 Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	3,4,8,15		
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y			
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1,3,4,7,8,9,18,20	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				

Notes: Wetland is right next to I-93 corridor

* Refer to backup list of numbered considerations.

APPENDIX F. Completed USACE Wetland Delineation Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 21 August 2017
 Applicant/Owner: NH DOT State: NH Sampling Point: N1-A (wet)
 Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): _____ Slope (%): 0
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Lim-Peatatus Complex NWI classification: R2UGHX

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p style="font-size: 1.2em; margin-left: 20px;">Annual floodplain of Spickett River. Backchannel & Levee morphology.</p>	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input checked="" type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>22"</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>21"</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

This serves as Plot for Wetlands N2 & N3

VEGETATION – Use scientific names of plants.

Sampling Point: ML-A (wet)

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Betula nigra</u>	<u>45</u>	<u>Y</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75%</u> (A/B)	
2. <u>Acer rubrum</u>	<u>35</u>	<u>Y</u>	<u>FAC</u>		
3. <u>Quercus alba</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>100</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>None</u>	_____	_____	_____		Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Baccharis cylindrica</u>	<u>6</u>	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
_____ = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.	
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Baccharis cylindrica</u>	<u>60</u>	<u>Y</u>	<u>OBL</u>		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Cinna arundinacea</u>	<u>15</u>	<u>N</u>	<u>FACW</u>		
3. <u>Carex sp.</u>	<u>2</u>	<u>N</u>	_____		
4. <u>Juncus effusus</u>	<u>2</u>	<u>N</u>	<u>OBL</u>		
5. <u>Panicum sp.</u>	<u>2</u>	<u>N</u>	_____		
6. <u>Bidens frondosa</u>	<u>2</u>	<u>N</u>	<u>FACU</u>		
7. _____	_____	_____	_____		
<u>83</u> = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____	_____	_____	_____		Remarks: (Include photo numbers here or on a separate sheet.)
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
_____ = Total Cover					

SOIL

Sampling Point: N2-A (wet)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-9	10YR3/2	90	10YR3/4	5	C	M	LVFS	A
0-9	10YR5/3	20					LVFS	A
9-16	7.5YR4/2	60					LVFS	Az
9-16	10YR 6/2	40					LVFS	Depleted
16-18+	7.5YR4/1	100					SIL	AB

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B)	<input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Dark Surface (S7) (LRR K, L)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)		<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	--

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem - Manchester City/County: Salem/Rockingham Sampling Date: 2 August 2017
Applicant/Owner: NH DOT State: NH Sampling Point: N1-B(4P)
Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range:
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%):
Subregion (LRR or MLRA): Lat: Long: Datum:
Soil Map Unit Name: Lim-Pootaluck Complex NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No
Hydic Soil Present? Yes No X
Wetland Hydrology Present? Yes No X
Is the Sampled Area within a Wetland? Yes No X
Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8)
Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)
Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes No Depth (inches):
Water Table Present? Yes No Depth (inches):
Saturation Present? (includes capillary fringe) Yes No Depth (inches):
Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: N1-B(4)

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Quercus alba</u>	<u>80</u>	<u>Y</u>	<u>FACU</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. <u>Pinus strobus</u>	<u>20</u>	<u>N</u>	<u>FACU</u>	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. <u>Acer rubrum</u>	<u>20</u>	<u>N</u>	<u>FAC</u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>120</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Fraxinus alba</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>70</u> = Total Cover				
Herb Stratum (Plot size: <u>5</u>)				
1. <u>Osmunda cinnamomea</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
2. <u>Corylus cornuta</u>	<u>7</u>	<u>N</u>	<u>FACU</u>	
3. <u>Rubus pubescens</u>	<u>3</u>	<u>N</u>	<u>FACW</u>	
4. <u>Quercus alba</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>52</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <u>X</u> No _____				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: N1-B (LP)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5YR 3/3	-	-	-	-	-		O _i Fibric
2-10	7.5YR 3/1	-	-	-	-	-	SIL	A
10-14	10YR 5/4	-	-	-	-	-	LVFS	Bw ₁
14-18+	10YR 6/4	-	-	-	-	-	LVFS	Bw ₂

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

- Hydric Soil Indicators:**
- Histosol (A1)
 - Histic Epipedon (A2)
 - Black Histic (A3)
 - Hydrogen Sulfide (A4)
 - Stratified Layers (A5)
 - Depleted Below Dark Surface (A11)
 - Thick Dark Surface (A12)
 - Sandy Mucky Mineral (S1)
 - Sandy Gleyed Matrix (S4)
 - Sandy Redox (S5)
 - Stripped Matrix (S6)
 - Dark Surface (S7) (LRR R, MLRA 149B)
 - Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
 - Thin Dark Surface (S9) (LRR R, MLRA 149B)
 - Loamy Mucky Mineral (F1) (LRR K, L)
 - Loamy Gleyed Matrix (F2)
 - Depleted Matrix (F3)
 - Redox Dark Surface (F6)
 - Depleted Dark Surface (F7)
 - Redox Depressions (F8)
 - 2 cm Muck (A10) (LRR K, L, MLRA 149B)
 - Coast Prairie Redox (A16) (LRR K, L, R)
 - 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
 - Dark Surface (S7) (LRR K, L)
 - Polyvalue Below Surface (S8) (LRR K, L)
 - Thin Dark Surface (S9) (LRR K, L)
 - Iron-Manganese Masses (F12) (LRR K, L, R)
 - Piedmont Floodplain Soils (F19) (MLRA 149B)
 - Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
 - Red Parent Material (F21)
 - Very Shallow Dark Surface (TF12)
 - Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

N4-A (wet)

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Roxburyham Sampling Date: 2 August 2017
Applicant/Owner: NHDOT State: NH Sampling Point: N4-A (wet)
Investigator(s): Kevin Ryan, Chris Deion Section, Township, Range:
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%):
Subregion (LRR or MLRA): LRR-R Lat: Long: Datum:
Soil Map Unit Name: Deerfield fine sandy loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Table with 2 columns: Hydrophytic Vegetation Present?, Hydric Soil Present?, Wetland Hydrology Present? and Is the Sampled Area within a Wetland?
Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) and Secondary Indicators (minimum of two required)
List of indicators A1 through D5 with checkboxes.

Field Observations: Surface Water Present?, Water Table Present?, Saturation Present? (includes capillary fringe)
Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: VERNAL POOL DEPRESSION LIKELY HUMAN MODIFIED FOR GRANULAR BORROW MATERIAL

VEGETATION – Use scientific names of plants.

Sampling Point: N4-A(wet)

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Acer rubrum</u>	<u>75</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)	
2. <u>Ulmus americana</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>		
3. <u>Pinus strobus</u>	<u>15</u>	<u>N</u>	<u>FACU</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>115</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Ulmus americana</u>	<u>15</u>	<u>Y</u>	<u>FACW</u>		Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0' <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Frangula alnus</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>25</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.	
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Frangula alnus</u>	<u>1</u>	<u>NA</u>	<u>FAC</u>		Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. <u>Acer rubrum</u>	<u>1</u>	<u>N/A</u>	<u>FAC</u>		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>2</u> = Total Cover				Remarks: (Include photo numbers here or on a separate sheet.) <u>White Pine is outside of Pool depression</u>	
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>None</u>	_____	_____	_____		Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
_____ = Total Cover				Remarks: (Include photo numbers here or on a separate sheet.) <u>White Pine is outside of Pool depression</u>	

SOIL

Sampling Point: N4-A(wet)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0:10e							FIBRIC/HEMIC	
0-2 in.	7.5YR 5/1	100%		φ				
Bw1	10YR 5/6	100%		φ			SAND	15% GRAVEL
2-5								SINGLE GRAIN LOOSE
2-Bw2	2.5Y 6/1	100%					FINE	
5-16 in.†							LOAMY S1	
			7.5YR 4/6	15% C	M		SAND	
			2.5Y 7/1	10	D	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: NONE
 Depth (inches): φ

Hydric Soil Present? Yes No

Remarks:

OUTWASH GRAVELLY SAND WITH FINER SANDS AT THE 2BW2 HORIZON INTERFACE.

N4-B
N5-B

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem - Manchester City/County: Salem/Rockingham Sampling Date: 2 August 2017
 Applicant/Owner: MHDOT State: NH Sampling Point: N4-B (up)
 Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Small rise Local relief (concave, convex, none): Concave Slope (%): _____
 Subregion (LRR or MLRA): LRR-B Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Deerfield Fine Sandy Loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p style="font-size: 1.2em; text-align: center;">Shared upland Plot with wetland N5</p>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: <u>Sh</u>	

VEGETATION – Use scientific names of plants.

Sampling Point: N4-B (LP)

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pinus strobus</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>
2. <u>Aspen rubrum</u>	<u>20</u>	<u>N</u>	<u>FAC</u>
3. <u>Betula papyrifera</u>	<u>15</u>	<u>N</u>	<u>FACU</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fragaria virginiana</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Majanthemum canadense</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>
2. <u>Fragaria virginiana</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
3. <u>Aspen rubrum</u>	<u>1</u>	<u>N</u>	<u>FAC</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
 Total Number of Dominant Species Across All Strata: _____ (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0¹
- ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Monchester City/County: Salem/Rockingham Sampling Date: 2 August 2017
 Applicant/Owner: NHDOT State: NH Sampling Point: NS-A (wet)
 Investigator(s): Kevin Ryan, Chas Deaton Section, Township, Range:
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%):
 Subregion (LRR or MLRA): LRR-R Lat: Long: Datum:
 Soil Map Unit Name: Pits, sand and gravel NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u> If yes, optional Wetland Site ID: <u> </u>
Remarks: (Explain alternative procedures here or in a separate report.) <p style="font-size: 1.2em; margin-left: 40px;">Shares upland plot with NH</p>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) <u>X</u> Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <u>X</u> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ___ No <u>X</u> Depth (inches): <u> </u> Water Table Present? Yes ___ No <u>X</u> Depth (inches): <u> </u> Saturation Present? Yes ___ No <u>X</u> Depth (inches): <u> </u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: <p style="height: 40px;"> </p>	
Remarks: <p style="height: 100px;"> </p>	

VEGETATION – Use scientific names of plants.

Sampling Point: NS-A (wet)

Tree Stratum (Plot size: <u>20m x</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Acer rubrum</u>	<u>100</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. <u>Ulmus americana</u>	<u>25</u>	<u>N</u>	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>115</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Acer rubrum</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Fragaria alata</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>25</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Acer rubrum</u>	<u>1</u>	<u>N/A</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0' <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Fragaria alata</u>	<u>1</u>	<u>N/A</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>2</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)

N6-A (we)

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Salem - Manchester City/County: Salem/Roxingham Sampling Date: 2 August 2017
Applicant/Owner: NHDOT State: NH Sampling Point: N6-A (we)
Investigator(s): Kevin Ryan, Chris Dorion Section, Township, Range: ---
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR-R Lat: - Long: - Datum: -
Soil Map Unit Name: Deerfield fine sandy loam NWI classification: ---

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: (Explain alternative procedures here or in a separate report.) <u>Area is a Manmade Stormwater treatment area.</u>			If yes, optional Wetland Site ID: _____

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>21"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u> Saturation Present? (Includes capillary fringe) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: N6-A(wet)

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Ø</u>	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: _____ (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
_____ = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15' RADIUS</u>)				
1. <u>Salix bebbiana</u>	<u>10</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Alnus incana</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>15</u> = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5' RADIUS</u>)				
1. <u>Juncus effusus</u>	<u>30%</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Osmunda regalis</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Cladium mariscoides</u>	<u>15</u>	<u>N</u>	<u>OBL</u>	
4. <u>Carex vulpinoidea</u>	<u>10</u>	<u>N</u>	<u>OBL</u>	
5. <u>Lythrum salicaria</u>	<u>5</u>	<u>N</u>	<u>OBL</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>80</u> = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. <u>Ø</u>	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0'
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

N6-B(up)

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem Sampling Date: 2 August 2017
Applicant/Owner: NH DOT State: NH Sampling Point: N6-B(up)
Investigator(s): Kevin Ryan, Chris Daron Section, Township, Range:
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%): 0-2
Subregion (LRR or MLRA): LRR-B Lat: Long: Datum:
Soil Map Unit Name: Deerfield Fine Sandy Loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No X
Hydric Soil Present? Yes No X
Wetland Hydrology Present? Yes No X
Is the Sampled Area within a Wetland? Yes No X
If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B15) Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes No Depth (inches):
Water Table Present? Yes No Depth (inches):
Saturation Present? Yes No Depth (inches): (includes capillary fringe)
Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: N6-B(VP)

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Eleocharis umbellata</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Betula populifolia</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Fraxula carya</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
4. _____				
5. _____				
6. _____				
7. _____				
<u>30</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Festuca rubra</u>	<u>60</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Poa pratensis</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Schizochyrium scoparium</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
4. <u>Solidago canadensis</u>	<u>20</u>	<u>N</u>	<u>FACU</u>	
5. <u>Potentilla simplex</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
6. <u>Rubus rubescens</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
7. <u>Panicum laxedatum</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
<u>160</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Celastrus orbiculatus</u>	<u>30</u>			
2. _____				
3. _____				
4. _____				
_____ = Total Cover				

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

N9-A (wet)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 11 Sep 2017
Applicant/Owner: NHDOT State: NH Sampling Point: N9-A
Investigator(s): Kevin Ryan Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR or MLRA): LLR-R Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Swasea mucky peat NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: NC1-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Quercus nigra</u>	<u>60</u>	<u>Y</u>	<u>FACU</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. <u>Acer rubrum</u>	<u>50</u>	<u>Y</u>	<u>FAC</u>	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. <u>Saxifraga</u>	<u>20</u>	<u>N</u>	<u>FACW</u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>130</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Frangula alnus</u>	<u>50</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>50</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Oxalis sensilis</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0' <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Frangula alnus</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>50</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)

N9-B(UP)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem - Manchester City/County: Salem/Rainier Sampling Date: 9/11/17
 Applicant/Owner: MNDOT State: _____ Sampling Point: N9-B
 Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Road Shoulder Local relief (concave, convex, none): None Slope (%): 1
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Deerfield fine sandy loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: NG-B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Quercus rubra</u>	<u>70</u>	<u>Y</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40</u> (A/B)
2. <u>Acer rubrum</u>	<u>20</u>	<u>N</u>	<u>FAC</u>	
3. <u>Pinus strobus</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>105</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Pinus strobus</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Frangula alnus</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Malus sp.</u>	<u>5</u>	<u>N</u>	<u>-</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>35</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Pteridium aquilinum</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0' <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Frangula alnus</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Micranthemum canadense</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
4. <u>Quercus rubra</u>	<u>1</u>	<u>N</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>31</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes _____ No <u>X</u>				
Remarks: (Include photo numbers here or on a separate sheet.)				

N12-A(wet)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Beverly Sampling Date: 11 Sep 2017
 Applicant/Owner: NHDOT State: NH Sampling Point: N12-A
 Investigator(s): Kevin Ryan, Chris Dutton Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flood Plain Local relief (concave, convex, none): none Slope (%): 1
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Swansea Mucky Peat NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p style="font-size: 1.2em; color: blue;">Flood Plain wetland</p> </div>	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	_____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: NIZ-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Acer rubrum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>20</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Fraxinus nigra</u>	<u>1</u>	_____	<u>FAC</u>		Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0' <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Fraxinus pennsylvanica</u>	<u>2</u>	_____	<u>FACW</u>		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>3</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.	
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Juncus effusus</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
2. <u>Agrostis stolonifera</u>	<u>15</u>	<u>Y</u>	<u>FACW</u>		
3. <u>Typha latifolia</u>	<u>15</u>	<u>Y</u>	<u>OBL</u>		
4. <u>Lithium salicaria</u>	<u>10</u>	<u>N</u>	<u>OBL</u>		
5. <u>Agrostis gigantea</u>	<u>5</u>	<u>N</u>	<u>FACW</u>		
6. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>N</u>	<u>OBL</u>		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>70</u> = Total Cover					
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
_____ = Total Cover					

Remarks: (Include photo numbers here or on a separate sheet.)
Plots are linear to conform w/ shape of wetland

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 11 Sep 2017
 Applicant/Owner: NHDOT State: _____ Sampling Point: N12-B
 Investigator(s): Kevin Ryan, Chris Dones Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Highway Embankment Local relief (concave, convex, none): _____ Slope (%): 1
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Swansea mucky peat NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: N12-B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>none</u>	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phleum pratense</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
2. <u>Elymus repens</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
3. <u>Agrostis sp.</u>	<u>20</u>	<u>Y</u>	<u>-</u>
4. <u>Dactylis glomerata</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
5. <u>Lupinus polyphylus</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>
6. <u>Solidago rugosa</u>	<u>15</u>	<u>N</u>	<u>FAC</u>
7. <u>Plantago lanceolata</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
8. <u>Solidago canadensis</u>	<u>2</u>	<u>N</u>	<u>FACU</u>
9. <u>Fragaria alva</u>	<u>2</u>	<u>N</u>	<u>FAC</u>
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0'
 - 4 - Morphological Adaptations' (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation' (Explain)
- 'Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Upland grasses compose 80% areal coverage

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 2 Aug. 2017
 Applicant/Owner: NH DOT State: NH Sampling Point: N15-A (wet)
 Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: ---
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): ---
 Subregion (LRR or MLRA): L1B-2 Lat: --- Long: --- Datum: ---
 Soil Map Unit Name: Deersield fine sandy loam NWI classification: ---

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p style="font-size: 1.2em; margin-left: 20px;">Area is a marginal wetland</p>	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: NIS-A(uct)

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Acer rubrum</u>	<u>90</u>	<u>Y</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>60</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Fragaria alva</u>	<u>60</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>60</u> = Total Cover				
Herb Stratum (Plot size: <u>5</u>)				
1. <u>Fragaria alva</u>	<u>5</u>	<u>N/A</u>	<u>FAC</u>	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Maverick City/County: Salem/Roxburyham Sampling Date: 2 Aug 2013
 Applicant/Owner: MHDOT State: NH Sampling Point: MIS-B(UP)
 Investigator(s): Kevin Ryan, Chris Derosa Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): None Slope (%): _____
 Subregion (LRR or MLRA): L26-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Deerfield Fine Sandy Loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <div style="font-size: 1.2em; margin-top: 10px;">Area has</div>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: N15-B(LP)

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Pinus strobus</u>	<u>80</u>	<u>Y</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>80</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Fraxinus alnus</u>	<u>60</u>	<u>Y</u>	<u>FAC</u>		Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0' <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>60</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.	
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Miconium canadense</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>		Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
2. <u>Fraxinus alnus</u>	<u>2</u>	<u>N</u>	<u>FAC</u>		
3. <u>Acer rubrum</u>	<u>1</u>	<u>N</u>	<u>FAC</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>13</u> = Total Cover					
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
_____ = Total Cover					

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 28 August 2017
 Applicant/Owner: NH DOT State: NH Sampling Point: M3-A(v4)
 Investigator(s): Kevin Ryan, Chris Doran Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Deerfield fine sandy loam NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (minimum of one is required; check all that apply)</p> <p> <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) </p>	<p>Secondary Indicators (minimum of two required)</p> <p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) </p>
<p>Field Observations:</p> <p>Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____</p> <p>Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____</p> <p>Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)</p>	<p>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____</p>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: M3-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>
2. <u>Pinus strobus</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>
3. <u>Quercus rubra</u>	<u>15</u>	<u>N</u>	<u>FACU</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

125 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fragaria virginiana</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>
2. <u>Vaccinium corymbosum</u>	<u>5</u>	<u>N</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____

Prevalence Index = B/A = _____

30 = Total Cover

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fragaria virginiana</u>	<u>2</u>	<u>-</u>	<u>FAC</u>
2. <u>Acer rubrum</u>	<u>1</u>	<u>-</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

3 = Total Cover

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 28 August 2017
 Applicant/Owner: NH DOT State: NH Sampling Point: M3-B(up)
 Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: ---
 Landform (hillslope, terrace, etc.): level plain Local relief (concave, convex, none): none Slope (%): 1
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Deerfield fine Sandy loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION - Use scientific names of plants.

Sampling Point: M3-B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Pinus strobus</u>	<u>20</u>	<u>N</u>	<u>FACU</u>	
2. <u>Quercus alba</u>	<u>60</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Acer rubrum</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
				<u>110</u> = Total Cover
Sapling/Shrub Stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Pinus strobus</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Acer rubrum</u>	<u>10</u>	<u>N</u>	<u>FAC</u>	
3. <u>Vaccinium corymbosum</u>	<u>7</u>	<u>N</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
				<u>57</u> = Total Cover
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Quercus alba</u>	<u>7</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Vaccinium angustifolium</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Acer rubrum</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
4. <u>Rubus hispidus</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	
5. <u>Carex noveboracensis</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
6. <u>Meibomia canadensis</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
				<u>36</u> = Total Cover
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
				_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: M3-B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5YR 2.5/1	100	-	-	-	-	VFSL	AP1
2-4	7.5YR 3/2	100	-	-	-	-	YFSL	AP2
4-6	7.5YR 5/2	100	-	-	-	-	VFS	E
6-14+	10YR 3/4	100	-	-	-	-	F-MS	Bw

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: -
 Depth (inches): -

Hydric Soil Present? Yes No

Remarks:

Area has been regraded.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Roxburyham Sampling Date: 11 Sep 2017
 Applicant/Owner: MHDOT State: NH Sampling Point: M10-A
 Investigator(s): Kevin Ryan, Chris Doion Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Highway Median Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Canton fine sandy loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <p> <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) </p>	<p><u>Secondary Indicators (minimum of two required)</u></p> <p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) </p>
<p>Field Observations:</p> <p>Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____</p> <p>Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____</p> <p>Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)</p>	<p>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____</p>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION - Use scientific names of plants.

Sampling Point: M10-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>			<u>C</u>
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Scirpus cyperinus</u>	<u>30</u>	<u>Y</u>	<u>OBL</u>
2. <u>Nypha angustifolia</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>
3. <u>Lythrum salicaria</u>	<u>10</u>	<u>N</u>	<u>OBL</u>
4. <u>Juncus effusus</u>	<u>10</u>	<u>N</u>	<u>OBL</u>
5. <u>Lactuca Scariola</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 11 Sep '17
 Applicant/Owner: NHDOT State: NH Sampling Point: M10-B
 Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Highway median Local relief (concave, convex, none): - Slope (%): -
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Center fine sandy loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: M10-B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Ambrosia artemisiifolia</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
2. <u>Setaria glauca</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>
3. <u>Rudbeckia hirta</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
4. <u>Oenothera biennis</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
5. <u>Cystium vulgare</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
6. <u>Panicum sp.</u>	<u>5</u>	<u>N</u>	<u>-</u>
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Manchester Sampling Date: 11 Sep 2017
 Applicant/Owner: NH DOT State: NH Sampling Point: M12-A
 Investigator(s): Kevin Ryan, Chris Dorion Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Highway Median Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Swansea Mucky Peat NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><1"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>4"</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks: 	

VEGETATION – Use scientific names of plants.

Sampling Point: MIZ-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>
2. <u>Ulmus americana</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fragaria elvus</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>
2. <u>Viburnum dentatum</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of: 70 = Total Cover

Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Calamagrostis canadensis</u>	<u>50</u>	<u>Y</u>	<u>OBL</u>
2. <u>Thelypopsis palustris</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>
3. <u>Solanum dulcamara</u>	<u>15</u>	<u>N</u>	<u>FAC</u>
4. <u>Impatiens capensis</u>	<u>10</u>	<u>N</u>	<u>FACW</u>
5. <u>Iris versicolor</u>	<u>5</u>	<u>N</u>	<u>OBL</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
_____	_____	_____	_____

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem - Manchester City/County: Salem/Rockingham Sampling Date: 11 Sep 2017
Applicant/Owner: NHDOT State: NH Sampling Point: MIZ-B
Investigator(s): Kevin Ryan, Chris Dorion Section, Township, Range: _____
Landform (hillslope, terrace, etc.): level area Local relief (concave, convex, none): — Slope (%): 1-2%
Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Swansea mucky peat NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes <u>X</u> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No <u>X</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? Yes _____ No X Depth (inches): _____
(Includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No water-stained leaves or other indicators of hydrology.

VEGETATION – Use scientific names of plants.

Sampling Point: M12-B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>
2. <u>Pinus strobus</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>90</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fragula alnus</u>	<u>80</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>80</u> = Total Cover			
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fragula alnus</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>
2. <u>Lyonia ligustrina</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
<u>25</u> = Total Cover			
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
_____ = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

- Hydrophytic Vegetation Indicators:**
- ___ 1 - Rapid Test for Hydrophytic Vegetation
 - ___ 2 - Dominance Test is >50%
 - ___ 3 - Prevalence Index is ≤3.0¹
 - ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - ___ Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

S1-A (wet)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 11 SEP 2017

Applicant/Owner: NH DOT State: NH Sampling Point: S1-A

Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): none Slope (%): -

Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Pipestone Sand NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
--	--

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>4</u> Saturation Present? (includes capillary fringe) Yes <u>X</u> No _____ Depth (inches): <u>0</u>	Wetland Hydrology Present? Yes <u>X</u> No _____
--	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SI-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Acer rubrum</u>	<u>90</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>90</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Fragaria virginiana</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>		Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>40</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.	
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Carex gynandra</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Boehmeria cylindrica</u>	<u>15</u>	<u>Y</u>	<u>OBL</u>		
3. <u>Cinna arundinacea</u>	<u>10</u>	<u>Y</u>	<u>FACW</u>		
4. <u>Thelypteris palustris</u>	<u>5</u>	<u>N</u>	<u>FACW</u>		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>50</u> = Total Cover					
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
_____ = Total Cover					

Remarks: (Include photo numbers here or on a separate sheet.)

SS-B (up)
S1-B

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 11 Sep 2017
 Applicant/Owner: MH DOT State: NH Sampling Point: S3-B
 Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): level plain Local relief (concave, convex, none): none Slope (%): 1
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Pipestone Sand NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>Shared upland Plot with S2 & S3</u>	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	_____ Surface Soil Cracks (B6)
_____ Surface Water (A1)	_____ Drainage Patterns (B10)
_____ High Water Table (A2)	_____ Moss Trim Lines (B16)
_____ Saturation (A3)	_____ Dry-Season Water Table (C2)
_____ Water Marks (B1)	_____ Crayfish Burrows (C8)
_____ Sediment Deposits (B2)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Drift Deposits (B3)	_____ Stunted or Stressed Plants (D1)
_____ Algal Mat or Crust (B4)	_____ Geomorphic Position (D2)
_____ Iron Deposits (B5)	_____ Shallow Aquitard (D3)
_____ Inundation Visible on Aerial Imagery (B7)	_____ Microtopographic Relief (D4)
_____ Sparsely Vegetated Concave Surface (B8)	_____ FAC-Neutral Test (D5)
_____ Water-Stained Leaves (B9)	
_____ Aquatic Fauna (B13)	
_____ Marl Deposits (B15)	
_____ Hydrogen Sulfide Odor (C1)	
_____ Oxidized Rhizospheres on Living Roots (C3)	
_____ Presence of Reduced Iron (C4)	
_____ Recent Iron Reduction in Tilled Soils (C6)	
_____ Thin Muck Surface (C7)	
_____ Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes _____ No Depth (inches): _____
 Water Table Present? Yes _____ No Depth (inches): _____
 Saturation Present? Yes _____ No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 53-B

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Acer rubrum</u>	<u>50</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
2. <u>Pinus strobus</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>80</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fragula virginiana</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>70</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fragula virginiana</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Mianthemum canadensis</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
3. <u>Prunus sp.</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
4. <u>Quercus rubra</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
5. <u>Rubus pubescens</u>	<u>2</u>	<u>N</u>	<u>FACW</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>31</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S3-B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5YR 2.5/3	100	-	-	-	-	Fabric	Oi
2-7	10YR 5/3	100	-	-	-	-	LVFS	Ap1
7-11	10YR 4/3	100	-	-	-	-	LVFS	Ap2
11-18+	10YR 6/4	100	-	-	-	-	LVFS	Bw

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 11 Sep 2017
 Applicant/Owner: NH DOT State: NH Sampling Point: SS-A (Wet)
 Investigator(s): K. Ryan, C. Dorion Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Polechannel Local relief (concave, convex, none): CONCAVE Slope (%): 0
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Pipestone Sand NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input checked="" type="checkbox"/> Water-Stained Leaves (B9)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Marl Deposits (B15)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<p><u>Secondary Indicators (minimum of two required)</u></p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> Surface Soil Cracks (B6)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Drainage Patterns (B10)</td> </tr> <tr> <td><input type="checkbox"/> Moss Trim Lines (B16)</td> </tr> <tr> <td><input type="checkbox"/> Dry-Season Water Table (C2)</td> </tr> <tr> <td><input type="checkbox"/> Crayfish Burrows (C8)</td> </tr> <tr> <td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td> </tr> <tr> <td><input type="checkbox"/> Stunted or Stressed Plants (D1)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Geomorphic Position (D2)</td> </tr> <tr> <td><input type="checkbox"/> Shallow Aquitard (D3)</td> </tr> <tr> <td><input type="checkbox"/> Microtopographic Relief (D4)</td> </tr> <tr> <td><input type="checkbox"/> FAC-Neutral Test (D5)</td> </tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> Microtopographic Relief (D4)	<input type="checkbox"/> FAC-Neutral Test (D5)
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<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)																															
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)																															
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<p>Field Observations:</p> <table style="width:100%;"> <tr> <td>Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____</td> <td rowspan="3" style="vertical-align: middle; text-align: center;"> Wetland Hydrology Present? Yes <u>X</u> No _____ </td> </tr> <tr> <td>Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____</td> </tr> <tr> <td>Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____</td> </tr> </table>	Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____	Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____	Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____																												
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks:																																

VEGETATION – Use scientific names of plants.

Sampling Point: S3-A

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>70</u>	<u>Y</u>	
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

70 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B)

Prevalence Index = B/A = _____

_____ = Total Cover

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Boehmeria cylindrica</u>	<u>80</u>	<u>Y</u>	
2. <u>Onoclea sensibilis</u>	<u>20</u>	<u>N</u>	<u>FACW</u>
3. <u>Cinna arundinacea</u>	<u>5</u>	<u>N</u>	
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

105 = Total Cover

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S3-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-13	10YR 2/1	100	-	-	-	-	Sapric	Oa
13-20+	10YR 5/2	100	-	-	-	-	LVFS	Bg

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

S4-A (wet)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Sampling Date: 11 Sep. 2017
Applicant/Owner: NHDOT State: NH Sampling Point: S4-A
Investigator(s): Kevin Ryan, Chris Donian Section, Township, Range:
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR or MLRA): LRR-R Lat: Long: Datum:
Soil Map Unit Name: SCl over fine sandy loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No
Hydric Soil Present? Yes X No
Wetland Hydrology Present? Yes X No
Is the Sampled Area within a Wetland? Yes X No
Remarks: (Explain alternative procedures here or in a separate report.)
Area is Potential vernal Pool

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) X Water-Stained Leaves (B9)
High Water Table (A2) Aquatic Fauna (B13)
Saturation (A3) Marl Deposits (B15)
Water Marks (B1) Hydrogen Sulfide Odor (C1)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3)
Drift Deposits (B3) Presence of Reduced Iron (C4)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6)
Iron Deposits (B5) Thin Muck Surface (C7)
Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks)
X Sparsely Vegetated Concave Surface (B8)
Surface Soil Cracks (B6)
Drainage Patterns (B10)
Moss Trim Lines (B16)
Dry-Season Water Table (C2)
Crayfish Burrows (C8)
Saturation Visible on Aerial Imagery (C9)
Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
Shallow Aquitard (D3)
Microtopographic Relief (D4)
FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes No X Depth (inches): -
Water Table Present? Yes X No Depth (inches): 10"
Saturation Present? (includes capillary fringe) Yes X No Depth (inches): 7"
Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: S4-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>90</u>	<u>Y</u>	<u>FAC</u>
2. <u>Quercus rubra</u>	<u>20</u>	<u>N</u>	<u>FACW</u>
3. <u>Pinus strobus</u>	<u>5</u>	<u>N</u>	<u>FACW</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Sapling/Shrub Stratum (Plot size: 15')

1. <u>None</u>	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

120 = Total Cover

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species <u>90</u>	x 3 = <u>270</u>
FACU species <u>20</u>	x 4 = <u>80</u>
UPL species _____	x 5 = _____
Column Totals: <u>120</u> (A)	<u>350</u> (B)

Prevalence Index = B/A = 30

Herb Stratum (Plot size: 5')

1. <u>Acer rubrum</u>	<u>1</u>	_____	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

_____ = Total Cover

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is $\leq 3.0^1$
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Woody Vine Stratum (Plot size: _____)

1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

_____ = Total Cover

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Oak growing from surrounding wood

SOIL

Sampling Point: SH-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	7.5YR2.5/2	100	-	-	-	-	Fibric	Oi
3-12	10YR2/1	100	-	-	-	-	Sapric	Oa
12-18+	2.5Y4/1	100					VPSL	Bg

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
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- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

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- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
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- Redox Depressions (F8)

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- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
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- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: -
 Depth (inches): -

Hydric Soil Present? Yes No

Remarks:

SS-B
S6-B

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 11 SEP. 2017
 Applicant/Owner: NHDOT State: NH Sampling Point: S4-B
 Investigator(s): Kevin Ryan, Chris Dorion Section, Township, Range: -
 Landform (hillslope, terrace, etc.): Level Plain Local relief (concave, convex, none): None Slope (%): 1
 Subregion (LRR or MLRA): LR2-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Scio very fine sandy loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p style="font-size: 1.2em; margin-left: 20px;">Shared Upland Plot with S5 & S6</p>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: S4-B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Quercus rubra</u>	<u>85</u>	<u>Y</u>	<u>FACU</u>
2. <u>Pinus strobus</u>	<u>60</u>	<u>Y</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

145 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>5</u>	<u>-</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

_____ = Total Cover

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Quercus rubra</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
2. <u>Vaccinium angustifolium</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>
3. <u>Quercus alba</u>	<u>2</u>	<u>N</u>	<u>FACU</u>
4. <u>Prunus sp.</u>	<u>2</u>	<u>N</u>	<u>FACU</u>
5. <u>Miconthium condense</u>	<u>2</u>	<u>N</u>	<u>FACU</u>
6. <u>Fragula alnus</u>	<u>2</u>	<u>N</u>	<u>FAC</u>
7. <u>_____</u>	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

38 = Total Cover

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is $\leq 3.0^1$

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

_____ = Total Cover

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic Vegetation Present? Yes _____ No X

SOIL

Sampling Point: S4-B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5YR 2.5/2	100	-	-	-	-	Fine	O _i
2-3	7.5YR 3/1	100	-	-	-	-	Hemic	O _e
3-8	7.5YR 4/4	100	-	-	-	-	VFSL	Ap1
8-15	10YR 4/3	100	-	-	-	-	VFSL	Ap2
15-18+	10YR 5/4	100	-	-	-	-	VFSL	Bw

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B)	<input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Dark Surface (S7) (LRR K, L)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)	
<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Red Parent Material (F21)	
<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)		<input type="checkbox"/> Other (Explain in Remarks)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <u>X</u>
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Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 11 Sep 2017
 Applicant/Owner: NH DOT K State: NH Sampling Point: S7-A
 Investigator(s): Kevin Ryan, Chris Donion Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none 193 embn. Slope (%): 0
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Deerfield fine sandy loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p style="font-size: 1.2em; margin-left: 20px;">Wetland is in Harris Brook Floodplain</p>	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: S7-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Acer rubrum</u>	<u>60</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>60</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fragula alnus</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>70</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Carex intumescens</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Glyceria melicaria</u>	<u>30</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Bidens frondosa</u>	<u>8</u>	<u>N</u>	<u>FACW</u>	
4. <u>Sium suave</u>	<u>2</u>	<u>N</u>	<u>OBL</u>	
5. <u>Impatiens capensis</u>	<u>2</u>	<u>N</u>	<u>FACW</u>	
6. <u>Rhus toxicodendron</u>	<u>1</u>	<u>N</u>	<u>FAC</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>83</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: S7A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR2/1	100	-	-	-	-	Sapric	O _a
8-15+	10YR3/1	100	-	-	-	-	Loam	A-much

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem - Manchester City/County: Salem/Roxingham Sampling Date: 11 Sep 2017
 Applicant/Owner: NHDOT State: NH Sampling Point: S8-B
 Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Level Plain Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Deerfield fine Sandy loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Marl Deposits (B15)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<p><u>Secondary Indicators (minimum of two required)</u></p> <table style="width:100%;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Stunted or Stressed Plants (D1)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input type="checkbox"/> Microtopographic Relief (D4)</td></tr> <tr><td><input type="checkbox"/> FAC-Neutral Test (D5)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> Microtopographic Relief (D4)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)																															
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)																															
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<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)																															
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<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)																															
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)																															
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)																															
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)																																
<input type="checkbox"/> Surface Soil Cracks (B6)																																
<input type="checkbox"/> Drainage Patterns (B10)																																
<input type="checkbox"/> Moss Trim Lines (B16)																																
<input type="checkbox"/> Dry-Season Water Table (C2)																																
<input type="checkbox"/> Crayfish Burrows (C8)																																
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)																																
<input type="checkbox"/> Stunted or Stressed Plants (D1)																																
<input type="checkbox"/> Geomorphic Position (D2)																																
<input type="checkbox"/> Shallow Aquitard (D3)																																
<input type="checkbox"/> Microtopographic Relief (D4)																																
<input type="checkbox"/> FAC-Neutral Test (D5)																																
<p>Field Observations:</p> Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <u>X</u>																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks:																																

VEGETATION – Use scientific names of plants.

Sampling Point: S8-B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>
2. <u>Quercus rubra</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

80 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

_____ = Total Cover

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Osmunda Cinnamomeum</u>	<u>60</u>	<u>Y</u>	<u>FACW</u>
2. <u>Fraxinus alba</u>	<u>10</u>	<u>N</u>	<u>FAC</u>
3. <u>Vaccinium corymbosum</u>	<u>5</u>	<u>N</u>	<u>FACW</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

_____ = Total Cover

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- ___ 1 - Rapid Test for Hydrophytic Vegetation
 - ___ 2 - Dominance Test is >50%
 - ___ 3 - Prevalence Index is ≤3.0¹
 - ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - ___ Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Roxingham Sampling Date: 11 Sep 2017
 Applicant/Owner: NHDOT State: NH Sampling Point: S8-A
 Investigator(s): Kevin Ryan, Chris Dorion Section, Township, Range: -
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): -
 Subregion (LRR or MLRA): LRR-R Lat: - Long: - Datum: -
 Soil Map Unit Name: Deerfield fine sandy loam NWI classification: -
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No - (If no, explain in Remarks.)
 Are Vegetation -, Soil -, or Hydrology - significantly disturbed? Are "Normal Circumstances" present? Yes X No -
 Are Vegetation -, Soil -, or Hydrology - naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>-</u> Hydric Soil Present? Yes <u>X</u> No <u>-</u> Wetland Hydrology Present? Yes <u>X</u> No <u>-</u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u>-</u> If yes, optional Wetland Site ID: <u>-</u>
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <u>-</u> No <u>X</u> Depth (inches): <u>-</u> Water Table Present? Yes <u>X</u> No <u>-</u> Depth (inches): <u>10</u> Saturation Present? (includes capillary fringe) Yes <u>X</u> No <u>-</u> Depth (inches): <u>6</u>	Wetland Hydrology Present? Yes <u>X</u> No <u>-</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: S8-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pinus strobus</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>
2. <u>Ulmus americanus</u>	<u>15</u>	<u>Y</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

45 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Cornus amomum</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>
2. <u>Fraxinus alnus</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

30 = Total Cover

Herb Stratum (Plot size: <u>6'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Impatiens capensis</u>	<u>80</u>	<u>Y</u>	<u>FACW</u>
2. <u>Onoclea sensibilis</u>	<u>20</u>	<u>N</u>	<u>FACW</u>
3. <u>Typha angustifolia</u>	<u>15</u>	<u>N</u>	<u>OBL</u>
4. <u>Periscaria sagittata</u>	<u>5</u>	<u>N</u>	<u>OBL</u>
5. <u>Sida acuminata</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

125 = Total Cover

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- ___ 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - ___ 3 - Prevalence Index is ≤3.0¹
 - ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - ___ Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Pinus Strobus growing from surrounding uplands

SOIL

Sampling Point: S8-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR2/2	100	-	-	-	-	SIL	A - mucky
4-11	10YR2/1	100	-	-	-	-	Sepic	Oa
11-18+	10YR4/2	90	10YR5/2	10	D	M	VFSL	Bg

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Roxingham Sampling Date: 11 Sep 2017
 Applicant/Owner: NHDOT State: NH Sampling Point: S9-A
 Investigator(s): Kevin Ryan, Chris Dorion Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): -
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Deerfield fine sandy loam NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: S9-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>90</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>none</u>	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Cinna latifolia</u>	<u>100</u>	<u>Y</u>	<u>FACW</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

Hydrophytic Vegetation Indicators:
 ___ 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 ___ 3 - Prevalence Index is ≤3.0¹
 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 ___ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic:

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Definitions of Vegetation Strata:
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S9-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
<u>05</u>	<u>10YR 2/1</u>	<u>100</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>Sclric</u>	<u>Oa</u>
<u>5-18+</u>	<u>10YR 5/2</u>	<u>100</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>VFS</u>	<u>Bg</u>

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

- | | | |
|---|--|--|
| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils³: |
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) | <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B) | <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L) | <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L) |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | | <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| <input type="checkbox"/> Sandy Redox (S5) | | <input type="checkbox"/> Red Parent Material (F21) |
| <input type="checkbox"/> Stripped Matrix (S6) | | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) | | <input type="checkbox"/> Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Manchester Sampling Date: 11 Sep 2017
Applicant/Owner: MHDOT State: NH Sampling Point: S9-B
Investigator(s): Kevin Ryan, Chris Dorion Section, Township, Range:
Landform (hillslope, terrace, etc.): Level Plain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR-R Lat: Long: Datum:
Soil Map Unit Name: Deerfield fine sandy loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No X
Hydric Soil Present? Yes No X
Wetland Hydrology Present? Yes No X
Is the Sampled Area within a Wetland? Yes No X
If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B15) Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes No X Depth (inches):
Water Table Present? Yes No X Depth (inches):
Saturation Present? (includes capillary fringe) Yes No X Depth (inches):
Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: **S9-B**

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pinus resinosa</u>	<u>60</u>	<u>Y</u>	<u>FACU</u>
2. <u>Pinus strobus</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Sapling/Shrub Stratum (Plot size: 15')

80 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fragaria alnus</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____

Prevalence Index = B/A = _____

Herb Stratum (Plot size: 5')

70 = Total Cover

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>3</u>	<u>-</u>	<u>FAC</u>
2. <u>Fragaria alnus</u>	<u>3</u>	<u>-</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

6 = Total Cover

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Woody Vine Stratum (Plot size: _____)

1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

_____ = Total Cover

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION – Use scientific names of plants.

Sampling Point: S1Z

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>			
2.			
3.			
4.			
5.			
6.			
7.			

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
 Total Number of Dominant Species Across All Strata: _____ (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>			
2.			
3.			
4.			
5.			
6.			
7.			

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by:
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Typha angustifolia</u>	<u>45</u>	<u>Y</u>	<u>OBL</u>
2. <u>Lysimachia terrestris</u>	<u>15</u>	<u>N</u>	<u>OBL</u>
3. <u>Bidens frondosa</u>	<u>10</u>	<u>N</u>	<u>FACW</u>
4. <u>Carex spp</u>	<u>12</u>	<u>N</u>	<u>-</u>
5. <u>Eleocharis sp.</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>
6. <u>Cladium mariscoides (sp)</u>	<u>2</u>	<u>N</u>	<u>OBL</u>
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines – All woody vines greater than 3.28 ft in height.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S12-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-11	10YR 2/1	100	—	—	—	—	VFS	A (mucky)
11-19+	10YR 7/2	90	7.5YR 4/4	10	C	M	V-MS	B

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: —
 Depth (inches): —

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 28 August '17
Applicant/Owner: NH DOT State: NH Sampling Point: SIC-B (up)
Investigator(s): Kevin Ryan, Chris Dorion Section, Township, Range:
Landform (hillslope, terrace, etc.): Level Plain Local relief (concave, convex, none): none Slope (%): 1%
Subregion (LRR or MLRA): LRR-R Lat: Long: Datum:
Soil Map Unit Name: Deerfield fine sandy loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No X
Hydric Soil Present? Yes No X
Wetland Hydrology Present? Yes No X
Is the Sampled Area within a Wetland? Yes No X
Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B15) Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes No X Depth (inches):
Water Table Present? Yes No X Depth (inches):
Saturation Present? (includes capillary fringe) Yes No X Depth (inches):
Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: S12-B

Tree Stratum (Plot size: <u>15x</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>			
2.			
3.			
4.			
5.			
6.			
7.			

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
 Total Number of Dominant Species Across All Strata: _____ (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fraxinus americana</u>	<u>12</u>	<u>Y</u>	<u>FACU</u>
2. <u>Populus tremuloides</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>
3. <u>Pinus strobus</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
4. <u>Alnus incana</u>	<u>2</u>	<u>N</u>	<u>FACW</u>
5.			
6.			
7.			

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B)

Prevalence Index = B/A = _____

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Solidago canadensis</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>
2. <u>Solidago rugosa</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
3. <u>Verbena</u>	<u>2</u>	<u>N</u>	
4. <u>Rosa sp.</u>	<u>2</u>	<u>N</u>	
5. <u>Lotus corniculatus</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>
6. <u>Ambrosia artemisiifolia</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
7. <u>Agrostis sp.</u>	<u>40</u>	<u>Y</u>	
8. <u>Carex scloperia</u>	<u>5</u>	<u>N</u>	<u>FACW</u>
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic-Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 28 August 17
Applicant/Owner: NH DOT State: NH Sampling Point: S17-A(wet)
Investigator(s): Kevin Ryan, Chris Dorion Section, Township, Range:
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR or MLRA): LRR-R Lat: Long: Datum:
Soil Map Unit Name: Deerfield fine sandy loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No
Hydric Soil Present? Yes X No
Wetland Hydrology Present? Yes X No
Is the Sampled Area within a Wetland? Yes X No
If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8)
Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)
Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes No X Depth (inches):
Water Table Present? Yes No X Depth (inches):
Saturation Present? (includes capillary fringe) Yes No X Depth (inches):
Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No saturation due to time of year

VEGETATION – Use scientific names of plants.

Sampling Point: S17-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>80</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>5</u>	<u>-</u>	<u>FAC</u>
2. <u>Fragula alnus</u>	<u>1</u>	<u>-</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is $\leq 3.0^1$
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Groundcover is a sphagnum mat (90% cover)

SOIL

Sampling Point: S17-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5YR 3/3	100	-	-	-	-	Fibric	O _i
2-11	10YR 2.5/1	100	-	-	-	-	Sapric	O _a
11-18+	10YR 4/2	90	7.5YR 4/4	10	C	1	SIL	B _g

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem - Manchester City/County: Salem/Rockingham Sampling Date: 28 August '17
 Applicant/Owner: NH DOT State: _____ Sampling Point: S17-B(up)
 Investigator(s): Kevin Ryan, Chris Porion Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): level plain Local relief (concave, convex, none): _____ Slope (%): 1
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Deerfield fine sandy loam NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (if no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required).</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: S17-B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pinus strobus</u>	<u>60</u>	<u>Y</u>	<u>FACU</u>
2. <u>Acer rubrum</u>	<u>30</u>	<u>N</u>	<u>FAC</u>
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1/4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

90 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>
2. <u>Frangula alnus</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

45 = Total Cover

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Mniamthemum canadense</u>	<u>60</u>	<u>Y</u>	<u>FACU</u>
2. <u>Pinus strobus</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>
3. <u>Frangula alnus</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
4. <u>Vaccinium angustifolium</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
5. <u>Acer rubrum</u>	<u>2</u>	<u>N</u>	<u>FAC</u>
6. <u>Trientalis borealis</u>	<u>2</u>	<u>N</u>	<u>FAC</u>
7. <u>Quercus rubra</u>	<u>1</u>	<u>N</u>	<u>FACU</u>
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is $\leq 3.0^1$
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

110 = Total Cover

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S17-B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5YR3/2	100	-	-	-	-	Fibric	Oi
2-4	7.5YR2.5/1	100	-	-	-	-		Oe
4-8	7.5YR5/2	100	-	-	-	-	VFS	E
8-10	5YR3/2	100	-	-	-	-	VFS	B ₅₁
10-15	7.5YR4/4	100	-	-	-	-	VFS	B ₅₂
15-20+	10YR6/6	100	-	-	-	-	VFS	BC

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: -
 Depth (inches): -

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem - Manchester City/County: Salem/Rockingham Sampling Date: 28 August '17
 Applicant/Owner: MHDOT State: _____ Sampling Point: S18-A (wet)
 Investigator(s): Kevin Ryan, Chris Dorion Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Scarboro Muck NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Groundcover = Sphagnum Mat

VEGETATION – Use scientific names of plants.

Sampling Point: S18-A

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (AB)

30 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Vaccinium corymbosum</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>
2. <u>Frangula alnus</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

30 = Total Cover

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Carex sp.</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>
2. <u>Scirpus ciperinus</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>
3. <u>Dulichium eridinsceum</u>	<u>5</u>	<u>N</u>	<u>OBL</u>
4. <u>Rubus pubescens</u>	<u>2</u>	<u>N</u>	<u>FACW</u>
5. <u>Acer rubrum</u>	<u>1</u>	<u>N</u>	<u>FAC</u>
6. <u>Polypodium Serriote</u>	<u>1</u>	<u>N</u>	<u>FACW</u>
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

44 = Total Cover

- Hydrophytic Vegetation Indicators:**
- ___ 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - ___ 3 - Prevalence Index is ≤3.0¹
 - ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - ___ Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

_____ = Total Cover

Hydrophytic Vegetation Present? Yes No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S18-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5YR2.5/1	100	-	-	-	-	Fibric	Oe ₁
2-5	5YR2.5/2	100	-	-	-	-	Fibric	Oe ₂
5-7	10YR2/1	100	-	-	-	-	Sapric	O _a
7-10	7.5YR5/2	100	7.5YR3/1	40	D	M	F-MS	B _{u1}
10-12	7.5YR3/4	100	-	-	-	-	F-MS	B _{u1}
12-18+	10YR6/3	40	10YR5/2	40	D	M	F-MS	B _{w2}
11	10YR5/2		7.5YR4/4	20	C	M	F-MS	B _{w2}

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem - Manchester City/County: Salem/Roxingham Sampling Date: 28 August '17
Applicant/Owner: NHDOT State: NH Sampling Point: S18-B(vP)
Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Level Plain Local relief (concave, convex, none): none Slope (%): 1%
Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Scarboro muck NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>_____</u>	Hydic Soil Present? Yes _____ No <u>X</u>	Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
If yes, optional Wetland Site ID: _____			
Remarks: (Explain alternative procedures here or in a separate report.)			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
--	--

Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
---	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: S18-B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Quercus rubra</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>
2. <u>Acer rubrum</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>
3. <u>Quercus alba</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>
4. <u>Pinus strobus</u>	<u>5</u>		<u>FACU</u>
5. _____			
6. _____			
7. _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

50 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Vaccinium corymbosum</u>	<u>60</u>	<u>Y</u>	<u>FACW</u>
2. <u>Sassafras albidum</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
3. <u>Fragaria virginiana</u>	<u>15</u>	<u>N</u>	<u>FAC</u>
4. <u>Ilex verticillata</u>	<u>3</u>	<u>N</u>	<u>FACW</u>
5. <u>Acer rubrum</u>	<u>2</u>	<u>N</u>	<u>FAC</u>
6. _____			
7. _____			

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

85 = Total Cover

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Vaccinium corymbosum</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>
2. <u>Rubus pubescens</u>	<u>2</u>	<u>N</u>	<u>FACW</u>
3. <u>Pinus strobus</u>	<u>2</u>	<u>N</u>	<u>FACU</u>
4. <u>Quercus rubra</u>	<u>1</u>	<u>N</u>	<u>FACU</u>
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

30 = Total Cover

- Hydrophytic Vegetation Indicators:**
- ___ 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - ___ 3 - Prevalence Index is ≤3.0¹
 - ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - ___ Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			

_____ = Total Cover

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S18-B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	5YR 2.5/2	100	-	-	-	-	Fibnc Oi	
2-7	10YR 2/1	100	-	-	-	-	Hemic Oe1	
7-13	7.5YR 3/1	100	-	-	-	-	F-MS A	
13-15	7.5YR 4/4	100	-	-	-	-	F-MS Bc1	
15-18+	7.5YR 4/6	100	-	-	-	-	F-MS Bc2	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (Inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 28 Aug. 2017
 Applicant/Owner: MHDOT State: NH Sampling Point: SZO-A(wet)
 Investigator(s): Kevin Ryan, Chris Daron Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Deerfield fine sandy loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (if no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data collected during dry time of year

VEGETATION - Use scientific names of plants.

Sampling Point: SZO-A

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Sapling/Shrub Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Vaccinium corymbosum</u>	<u>35</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>1</u>	<u>-</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S20-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-7	5YR 3/2	100	-	-	-	-	Fibric	O _i
7-15	7.5YR 2.5/1	100	-	-	-	-	Hemic	O _e
15-42+	10YR 2/1	100	-	-	-	-	Sapric	O _a

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 28 August 2017
Applicant/Owner: NH DOT State: NH Sampling Point: SZO-B(UP)
Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: -
Landform (hillslope, terrace, etc.): Level Plain Local relief (concave, convex, none): none Slope (%): 1
Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Deerfield fine sandy loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No <u>X</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? Yes _____ No X Depth (inches): _____ (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SZ0-B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Quercus alba</u>	<u>50</u>	<u>Y</u>	<u>FACW</u>
2. <u>Acer rubrum</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>
3. <u>Pinus strobus</u>	<u>10</u>	<u>N</u>	<u>FACW</u>
4. <u>Quercus rubra</u>	<u>7</u>	<u>N</u>	<u>FACW</u>
5. _____			
6. _____			
7. _____			

107 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pinus strobus</u>	<u>70</u>	<u>Y</u>	<u>FACW</u>
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			

70 = Total Cover

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Vaccinium angustifolium</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>
2. <u>Lycopodium obscurum</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>
3. <u>Rhaphidrodium canadense</u>	<u>7</u>	<u>N</u>	<u>FACW</u>
4. <u>Pinus virginiana</u>	<u>5</u>	<u>N</u>	<u>FACW</u>
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

52 = Total Cover

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			

_____ = Total Cover

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACW species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is $\leq 3.0^1$
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

SOIL

Sampling Point: S20-B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	5YR 3/3	100	-	-	-	-	Fibric	O _i
2-8	7.5YR 5/2	100	-	-	-	-	VFS	E
8-12	5YR 3/3	100	-	-	-	-	VFS	B _{ss}
12-16	7.5YR 3/4	100	-	-	-	-	VFS	B _{5z}
16-20+	10YR 4/4	100	-	-	-	-	VFS	B _c

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: -
 Depth (inches): -

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 28 August
 Applicant/Owner: NH DOT State: NH Sampling Point: S20-C
 Investigator(s): Kevin Ryan, Chris Donon Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): level Slope (%): 0
 Subregion (LRR or MLRA): LRR-R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Chocoma mucky peat NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input checked="" type="checkbox"/> Water-Stained Leaves (B9)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Marl Deposits (B15)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<p><u>Secondary Indicators (minimum of two required)</u></p> <table style="width:100%;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Stunted or Stressed Plants (D1)</td></tr> <tr><td><input checked="" type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input type="checkbox"/> Microtopographic Relief (D4)</td></tr> <tr><td><input type="checkbox"/> FAC-Neutral Test (D5)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> Microtopographic Relief (D4)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)																															
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<p>Field Observations:</p> Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks:																																

VEGETATION – Use scientific names of plants.

Sampling Point: 820-C

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>none</u>			
2.			
3.			
4.			
5.			
6.			
7.			

Sapling/Shrub Stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>none</u>			
2.			
3.			
4.			
5.			
6.			
7.			

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lythrum scilicaria</u>	<u>100</u>	<u>Y</u>	<u>FACW</u>
2. <u>Typha latifolia</u>	<u>5</u>	<u>N</u>	<u>OBL</u>
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem - Manchester City/County: Salem/Rockingham Sampling Date: 28 August '17
 Applicant/Owner: NH DOT State: NH Sampling Point: S23-A (wet)
 Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): level Local relief (concave, convex, none): none
 Slope (%): 0 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Pipestone Sand NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <u>Data collected at driest time of year.</u>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) <u>X</u> Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Muri Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) <u>X</u> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SZ3-A

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30</u>)				
1. <u>Acer rubrum</u>	<u>95</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>Pinus strobus</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
3. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15</u>)				
1. <u>Vaccinium corymbosum</u>	<u>60</u>	<u>Y</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Fragula claus</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
3. <u>Pinus strobus</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>70</u> = Total Cover				
Herb Stratum (Plot size: <u>5</u>)				
1. <u>Osmunda cinnamomea</u>	<u>1</u>	<u>-</u>	<u>FACW</u>	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
2. <u>Fragula claus</u>	<u>1</u>	<u>-</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: SZ3-A(wet)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-17	7.5YR2.4/2	100	-	-	-	-	Henic	Oe/Oa
17-20+	2.5Y 5/2	100	-	-	-	-	VFS	Bg

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:
 Depth (inches):

Hydric Soil Present? Yes No

Remarks:

5 CS & 5-7-13
(UP)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rochingham Sampling Date: 28 August 2017
 Applicant/Owner: NH DOT State: NH Sampling Point: SZ3-B
 Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Level Plain Local relief (concave, convex, none): none
 Slope (%): 1 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Scarboro much NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <div style="font-size: 24px; text-align: center;">Shared Plot with SZ4</div>	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: SZ3B

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>20</u>	<u>N</u>	<u>FAC</u>
2. <u>Quercus alba</u>	<u>20</u>	<u>N</u>	<u>FACU</u>
3. <u>Quercus rubra</u>	<u>45</u>	<u>Y</u>	<u>FACU</u>
4. <u>Pinus strobus</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

125 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pinus strobus</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>
2. <u>Hammamelis virginiana</u>	<u>8</u>	<u>N</u>	<u>FACU</u>
3. <u>Lonic ligustina</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____

Prevalence Index = B/A = _____

48 = Total Cover

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonic ligustina</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>
2. <u>Gaultheria procumbens</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>
3. <u>Smilax sp.</u>	<u>5</u>	<u>N</u>	_____
4. <u>Quercus alba</u>	<u>2</u>	<u>N</u>	<u>FACU</u>
5. <u>Osmunda cinnamomea</u>	<u>2</u>	<u>N</u>	<u>FACU</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0¹
- ___ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

54 = Total Cover

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SZ3B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (mpist)	%	Type ¹	Loc ²		
0-2	7.5YR3/2	100	-	-	-	-	Fibric	O _i
2-8	10YR2/2	100	-	-	-	-	VFS	A
8-15	7.5YR5/1	100	-	-	-	-	VFS	E
15-17	2.5Y3/3	100	-	-	-	-	VFS	B _{sl}
17-21+	7.5YR3/4	100	-	-	-	-	VFS	B _{sz}

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

- | | |
|--|--|
| Hydric Soil Indicators: | Indicators for Problematic Hydric Soils³: |
| <input type="checkbox"/> Histosol (A1)
<input type="checkbox"/> Histic Epipedon (A2)
<input type="checkbox"/> Black Histic (A3)
<input type="checkbox"/> Hydrogen Sulfide (A4)
<input type="checkbox"/> Stratified Layers (A5)
<input type="checkbox"/> Depleted Below Dark Surface (A11)
<input type="checkbox"/> Thick Dark Surface (A12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
<input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)
<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)
<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)
<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
<input type="checkbox"/> Dark Surface (S7) (LRR K, L)
<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)
<input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)
<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)
<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Type: _____ Depth (inches): _____	

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Salem-Manchester City/County: Salem/Rockingham Sampling Date: 28 August 2017
Applicant/Owner: NH DOT State: NH Sampling Point: SZ4
Investigator(s): Kevin Ryan, Chris Dorian Section, Township, Range:
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR or MLRA): LRR-R Lat: Long: Datum:
Soil Map Unit Name: Pipestone Sand NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No
Hydric Soil Present? Yes X No
Wetland Hydrology Present? Yes X No
Is the Sampled Area within a Wetland? Yes X No
Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required: check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) X Sparsely Vegetated Concave Surface (B8)
Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)
Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes No X Depth (inches):
Water Table Present? Yes No X Depth (inches):
Saturation Present? (includes capillary fringe) Yes No X Depth (inches):
Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: S24-A

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>75</u>	<u>Y</u>	<u>FAC</u>
2. <u>Quercus alba</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
3. <u>Pinus strobus</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Ilex verticillata</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
2. <u>Vaccinium corymbosum</u>	<u>15</u>	<u>Y</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>none</u>	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

- Hydrophytic Vegetation indicators:**
- ___ 1 - Rapid Test for Hydrophytic Vegetation
 - ___ 2 - Dominance Test is >50%
 - ___ 3 - Prevalence Index is ≤3.0¹
 - ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - ___ Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

White oak growing in surrounding upland
Groundcover is water-stained leaves

Appendix L – Wetland Impact Areas Map

\\vhb\gis\proj\Bedford\52541.00 I-93 Final Design\Project\Wetlands_Permitting_Figures\Wetland_Impacts_Mapbook.mxd



Legend

- Contract A Construction Footprint
- Existing Right of Way
- Delineated Wetland Edge (FB Environmental)
- Wetland Resource Area (FB Environmental)
- Existing Easement
- Non-Jurisdiction Drainage Area (FB Environmental)
- Open Water (FB Environmental)
- Approx. Top of Bank/Ordinary High Water
- Delineated Top of Bank/Ordinary High Water (FB Environmental)
- Non-Jurisdictional Drainage Area (FB Environmental)
- Impacted Wetland Area
- Scoured Channel (FB Environmental)
- 100' Prime Wetland Buffer
- NH Prime Wetland
- State Boundary

**NHDOT I-93
Salem - Manchester 13933A
FHWA A004 (435)**



Salem, NH

**I-93 Contract A
Wetland Impact Areas**

Page 1 of 3
Source: NHGRANIT, VHB, FBE





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Legend

- | | | | | |
|---|---|---|--|---------------------------|
| Contract A Construction Footprint | Existing Right of Way | Delineated Wetland Edge (FB Environmental) | Wetland Resource Area (FB Environmental) | 100' Prime Wetland Buffer |
| Existing Easement | Non-Jurisdiction Drainage Area (FB Environmental) | Delineated Top of Bank/Ordinary High Water (FB Environmental) | Open Water (FB Environmental) | NH Prime Wetland |
| Approx. Top of Bank/Ordinary High Water | Delineated Top of Bank/Ordinary High Water (FB Environmental) | Non-Jurisdictional Drainage Area (FB Environmental) | Impacted Wetland Area | State Boundary |
| Scoured Channel (FB Environmental) | | | | |

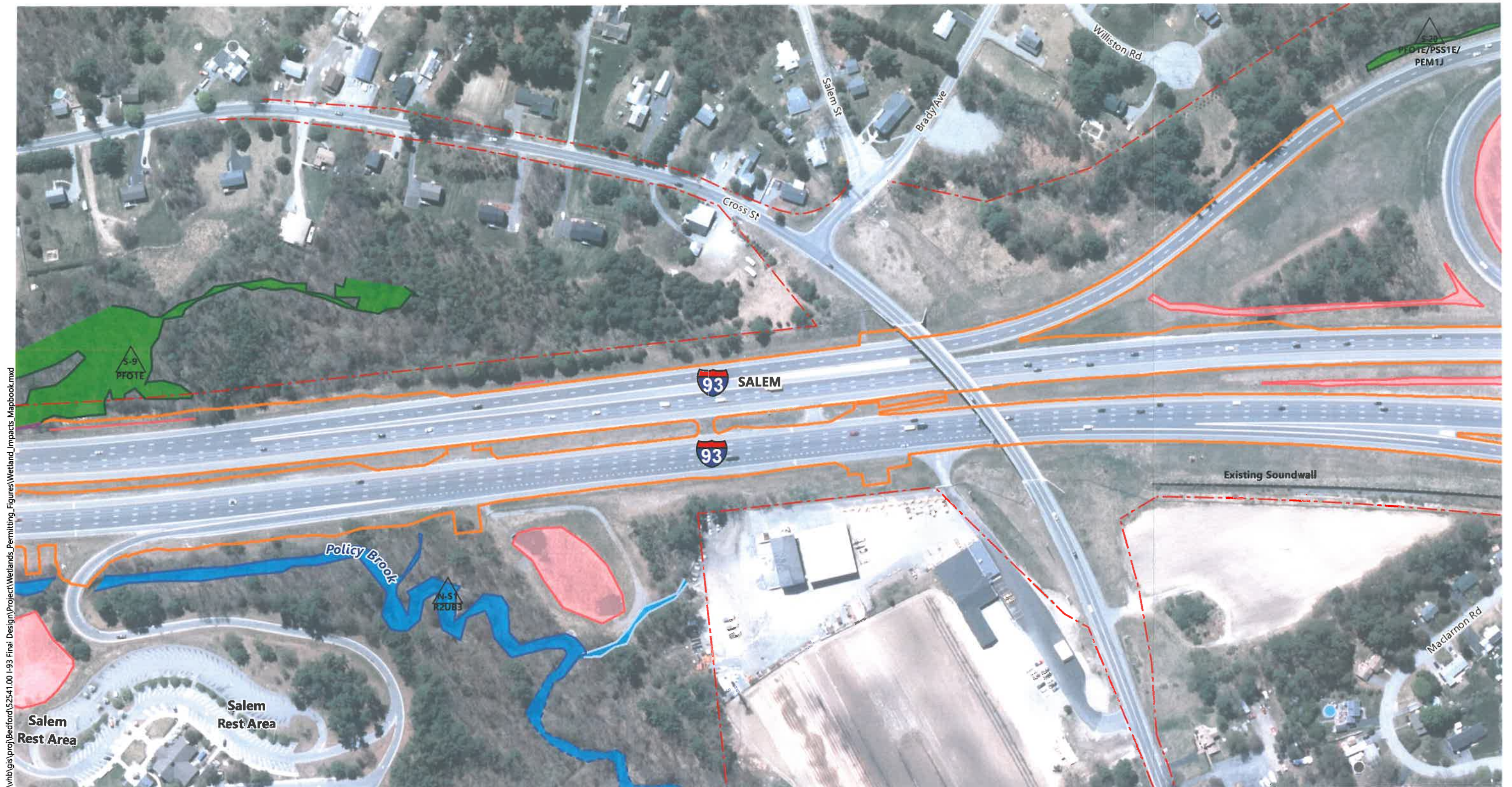
**NHDOT I-93
Salem - Manchester 13933A
FHWA A004 (435)**



Salem, NH

**I-93 Contract A
Wetland Impact Areas**





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Legend

- | | | | | |
|---|---|---|--|---------------------------|
| Contract A Construction Footprint | Existing Right of Way | Delineated Wetland Edge (FB Environmental) | Wetland Resource Area (FB Environmental) | 100' Prime Wetland Buffer |
| Existing Easement | Non-Jurisdiction Drainage Area (FB Environmental) | Delineated Top of Bank/Ordinary High Water (FB Environmental) | Open Water (FB Environmental) | NH Prime Wetland |
| Approx. Top of Bank/Ordinary High Water | Non-Jurisdictional Drainage Area (FB Environmental) | Scoured Channel (FB Environmental) | Impacted Wetland Area | State Boundary |

**NHDOT I-93
Salem - Manchester 13933A
FHWA A004 (435)**



Salem, NH

**I-93 Contract A
Wetland Impact Areas**

Page 3 of 3
Source: NHGRANIT, VHB, FBE



Appendix M – Wetland Impact Plans

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
WETLAND PLANS
FEDERAL AID PROJECT

A004(435)
N.H. PROJECT NO. 13933A
INTERSTATE 93
STATE LINE TO EXIT 1

STA. 3090+00
I-93 SB
END FULL DEPTH
CONSTRUCTION
BEGIN APPROACH

STA. 3091+50
I-93 SB
END APPROACH
LIMIT OF WORK
MATCH TO 14633J

STA. 3079+02.0, LT 117.6'
EXIT 1 SB OFF RAMP
LIMIT OF WORK

STA. 868+60.0
EXIT 1 SB ON RAMP
LIMIT OF WORK

STA. 1095+00
I-93 NB
END APPROACH
LIMIT OF WORK
MATCH TO 14633J

STA. 1090+00
I-93 NB
END FULL DEPTH
CONSTRUCTION
BEGIN APPROACH

STA. 1049+26.7, RT 141.0'
REST AREA NB ON RAMP
LIMIT OF WORK

STA. 1079+25.0, RT 70.7'
EXIT 1 NB OFF RAMP
LIMIT OF WORK

STA. 1045+81.7, RT 129.6'
REST AREA NB OFF RAMP
LIMIT OF WORK

STA. 2999+00
I-93 SB
LIMIT OF WORK
BEGIN APPROACH

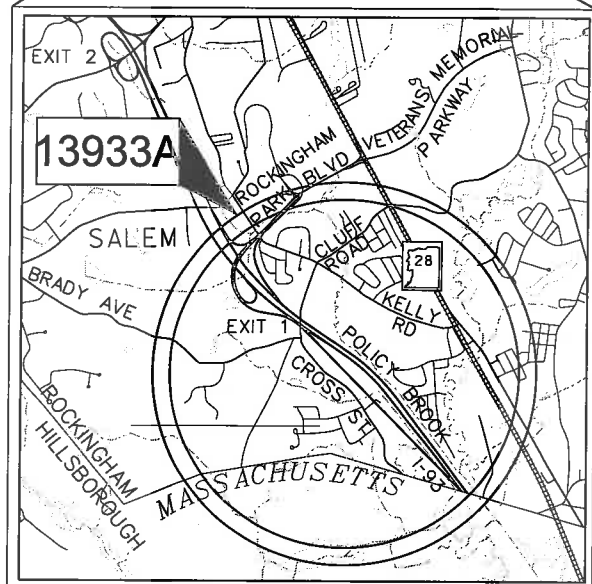
STA. 999+00
I-93 NB
LIMIT OF WORK
BEGIN APPROACH

STA. 3000+50
I-93 SB
END APPROACH
BEGIN FULL DEPTH
CONSTRUCTION

STA. 1001+00
I-93 NB
END APPROACH
BEGIN FULL DEPTH
CONSTRUCTION

TOWN OF SALEM
COUNTY OF ROCKINGHAM

SCALE: 1" = 500'



LOCATION MAP



INDEX OF SHEETS

1	FRONT SHEET
2-3	STANDARD SYMBOLS SHEETS
4	EROSION CONTROL STRATEGIES
5	DRAINAGE DETAILS
6-15	WETLAND IMPACT PLANS
16-25	EROSION CONTROL PLANS

TOB/OHW DETERMINED BY FB ENVIRONMENTAL, DECEMBER 2018
FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE THE CONSTRUCTION PLANS

NH DOT THE STATE OF
NEW HAMPSHIRE
DEPARTMENT OF
TRANSPORTATION

RECOMMENDED FOR APPROVAL:

DIRECTOR OF PROJECT DEVELOPMENT _____ DATE _____

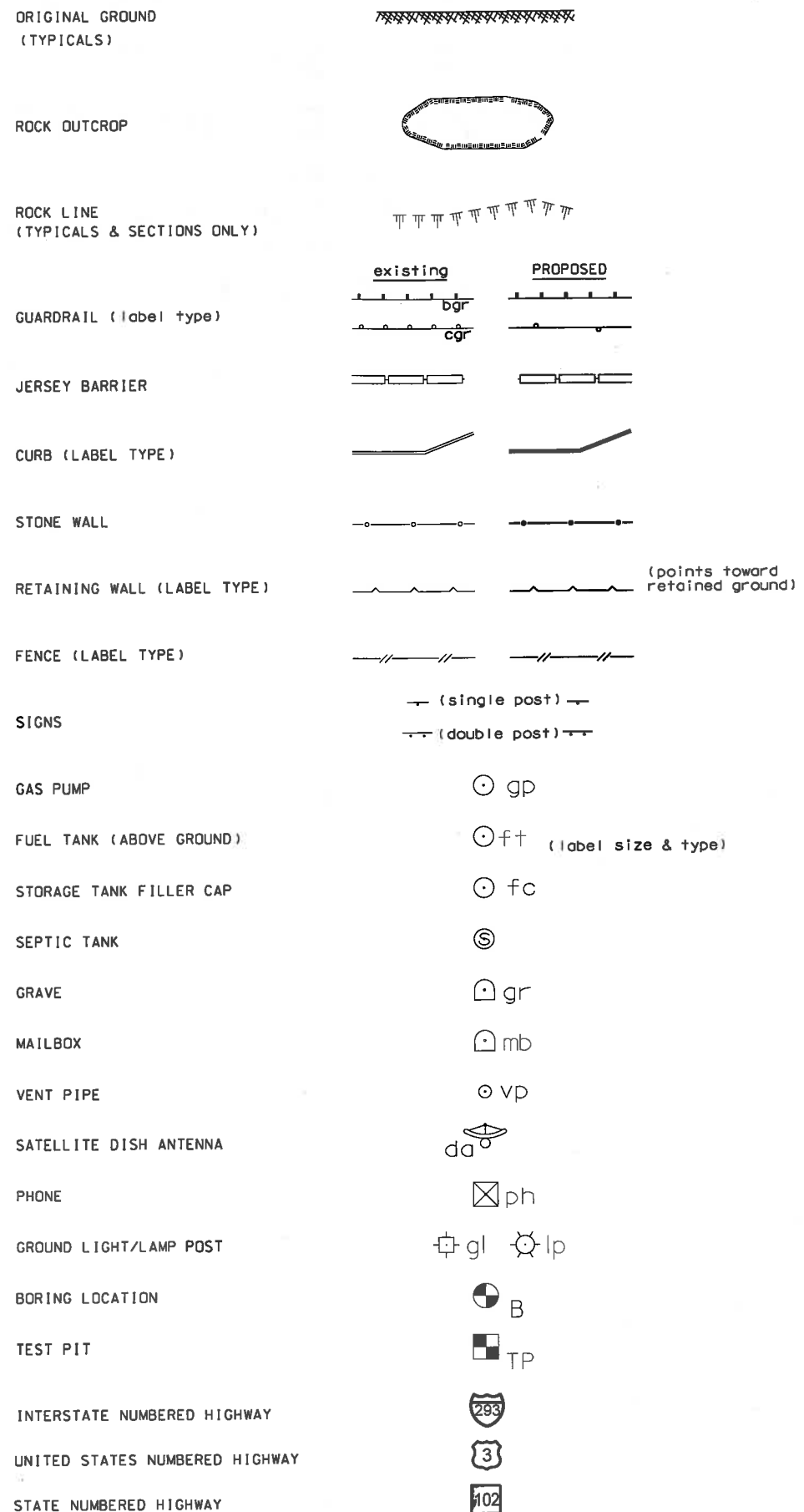
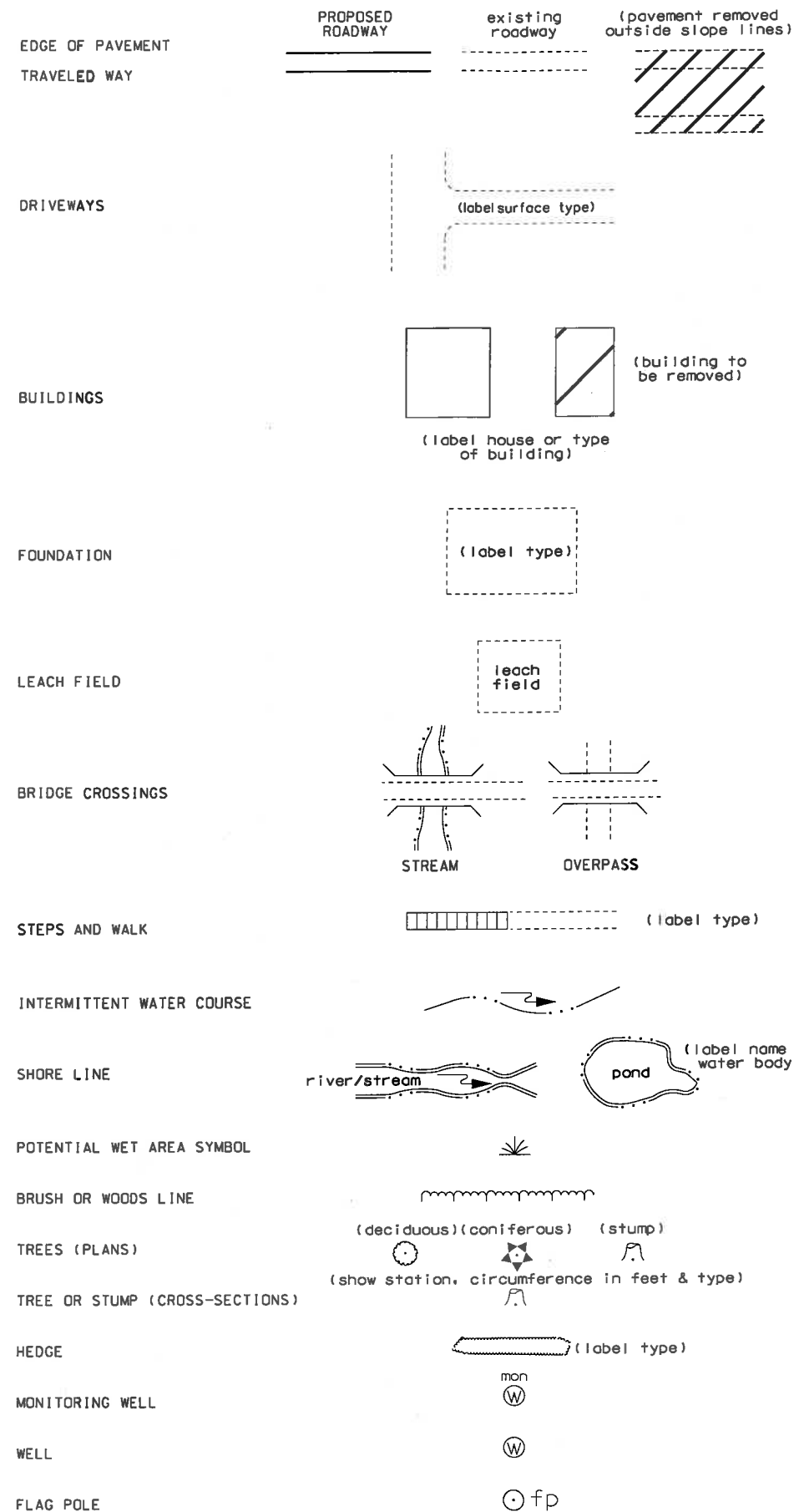
APPROVED:

ASSISTANT COMMISSIONER AND CHIEF ENGINEER _____ DATE _____

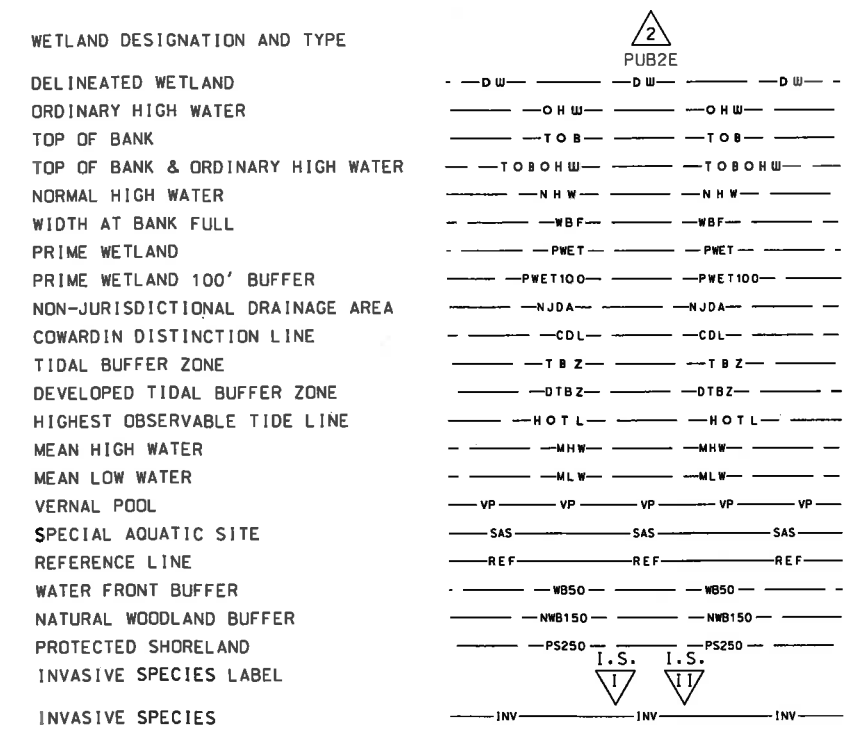
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DRAWN BY VHB TEAM DATE 11/16/2018
CHECKED BY J. HILTON DATE 11/16/2018

GENERAL



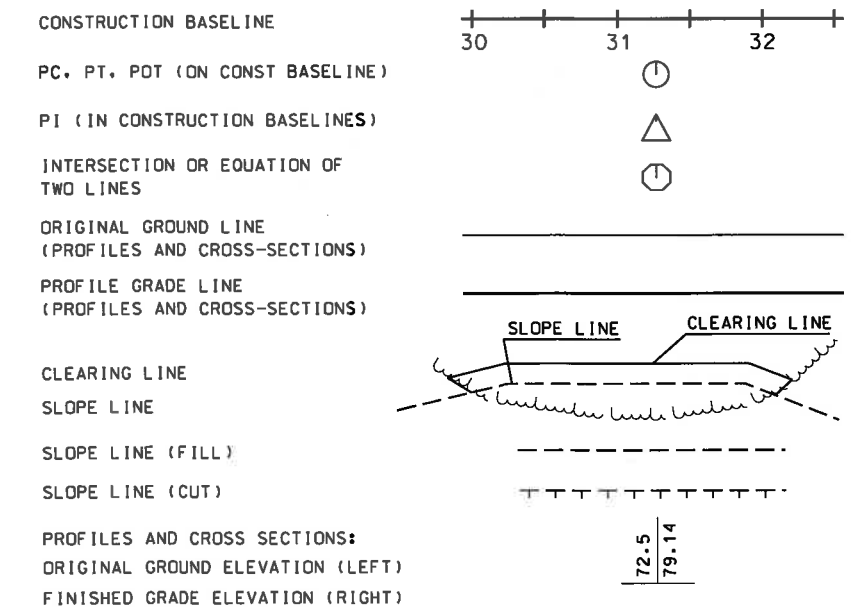
SHORELAND - WETLAND



FLOODPLAIN / FLOODWAY



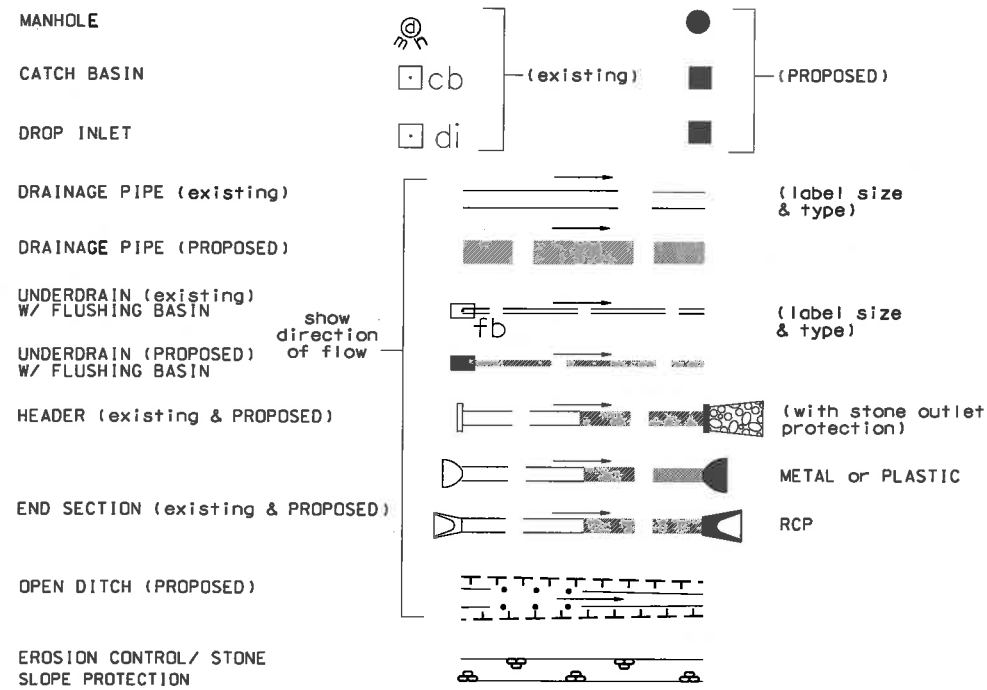
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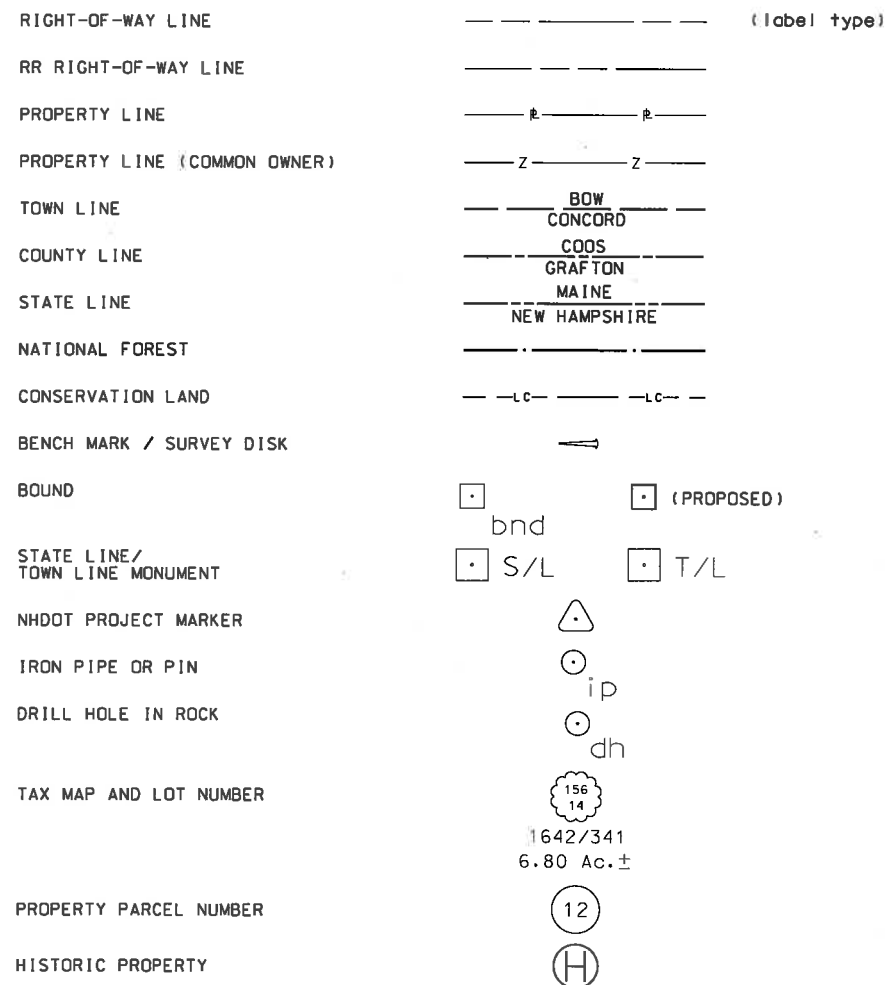
SHEET 1 OF 2

STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
STANDARD SYMBOLS				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
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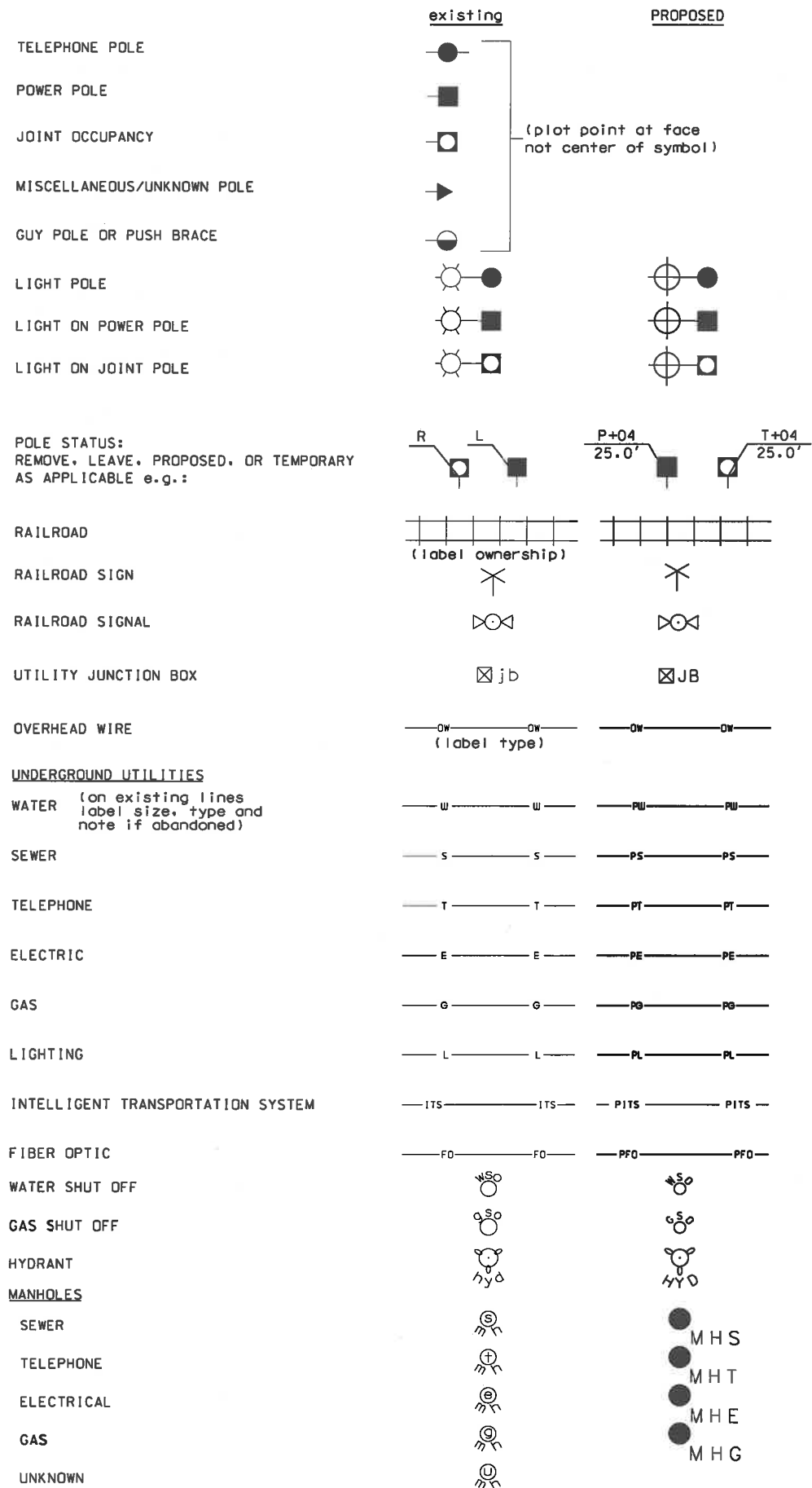
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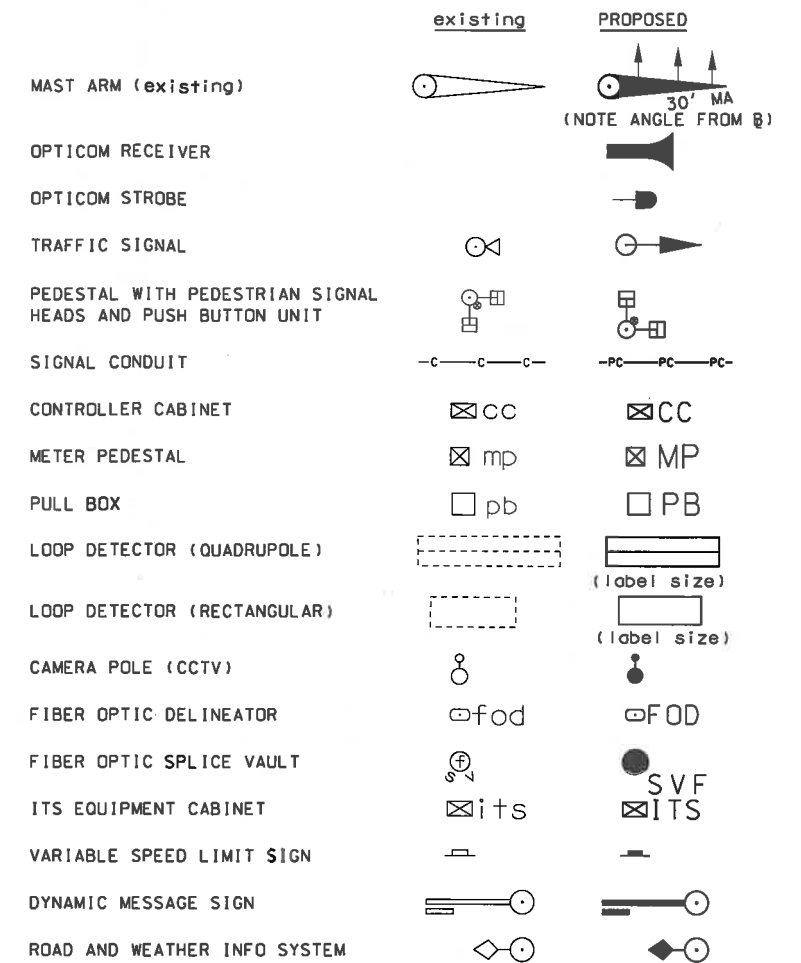
BOUNDARIES / RIGHT-OF-WAY



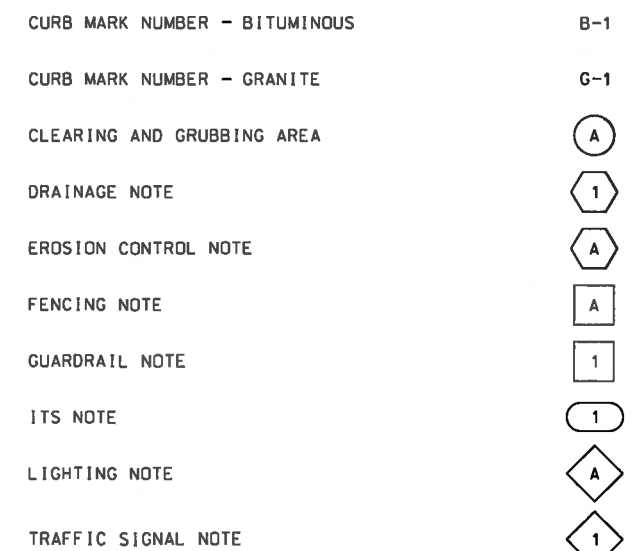
UTILITIES



TRAFFIC SIGNALS / ITS



CONSTRUCTION NOTES



SHEET 2 OF 2

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	13933ASYM.dgn	13933A	3	25

EROSION CONTROL STRATEGIES

1. ENVIRONMENTAL COMMITMENTS:
 - 1.1. THESE GUIDELINES DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH ANY CONTRACT PROVISIONS, OR APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
 - 1.2. THIS PROJECT WILL BE SUBJECT TO THE US EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT AS ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THIS PROJECT IS SUBJECT TO REQUIREMENTS IN THE MOST RECENT CONSTRUCTION GENERAL PERMIT (CGP).
 - 1.3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NHDES WETLAND PERMIT, THE US ARMY CORPS OF ENGINEERS PERMIT, WATER QUALITY CERTIFICATION AND THE SPECIAL ATTENTION ITEMS INCLUDED IN THE CONTRACT DOCUMENTS.
 - 1.4. ALL STORM WATER, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION (DECEMBER 2008) (BMP MANUAL) AVAILABLE FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES).
 - 1.5. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17, AND ALL PUBLISHED NHDES ALTERATION OF TERRAIN ENV-WQ 1500 REQUIREMENTS ([HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM](http://des.nh.gov/organization/commissioner/legal/rules/index.htm))
 - 1.6. THE CONTRACTOR IS DIRECTED TO REVIEW AND COMPLY WITH SECTION 107.1 OF THE CONTRACT AS IT REFERS TO SPILLAGE, AND ALSO WITH REGARDS TO EROSION, POLLUTION, AND TURBIDITY PRECAUTIONS.
2. STANDARD EROSION CONTROL SEQUENCING APPLICABLE TO ALL CONSTRUCTION PROJECTS:
 - 2.1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. PERIMETER CONTROLS AND STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN IN THE BMP MANUAL AND AS DIRECTED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARER.
 - 2.2. EROSION, SEDIMENTATION CONTROL MEASURES AND INFILTRATION BASINS SHALL BE CLEANED, REPLACED AND AUGMENTED AS NECESSARY TO PREVENT SEDIMENTATION BEYOND PROJECT LIMITS THROUGHOUT THE PROJECT DURATION.
 - 2.3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT AND SECTION 645 OF THE NHDOT SPECIFICATIONS FOR ROAD AND BRIDGES CONSTRUCTION.
 - 2.4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
 - (A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
 - (B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
 - (C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED;
 - (D) TEMPORARY SLOPE STABILIZATION CONFORMING TO TABLE 1 HAS BEEN PROPERLY INSTALLED
 - 2.5. ALL STOCKPILES SHALL BE CONTAINED WITH A PERIMETER CONTROL. IF THE STOCKPILE IS TO REMAIN UNDISTURBED FOR MORE THAN 14 DAYS, MULCHING WILL BE REQUIRED.
 - 2.6. A WATER TRUCK SHALL BE AVAILABLE TO CONTROL EXCESSIVE DUST AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR.
 - 2.7. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL THE AREA HAS BEEN PERMANENTLY STABILIZED.
 - 2.8. CONSTRUCTION PERFORMED ANY TIME BETWEEN NOVEMBER 30th AND MAY 1st OF ANY YEAR SHALL BE CONSIDERED WINTER CONSTRUCTION AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
 - (A) ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15th, OR WHICH ARE DISTURBED AFTER OCTOBER 15th, SHALL BE STABILIZED IN ACCORDANCE WITH TABLE 1.
 - (B) ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15th, OR WHICH ARE DISTURBED AFTER OCTOBER 15th, SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
 - (C) AFTER NOVEMBER 30th INCOMPLETE ROAD SURFACES, WHERE WORK HAS STOPPED FOR THE SEASON, SHALL BE PROTECTED IN ACCORDANCE WITH TABLE 1.
 - (D) WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE PROJECT IS WITHOUT STABILIZATION AT ONE TIME, UNLESS A WINTER CONSTRUCTION PLAN HAS BEEN APPROVED BY NHDOT THAT MEETS THE REQUIREMENTS OF ENV-WQ 1505.02 AND ENV-WQ 1505.05.
 - (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE DEPARTMENT, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV-WQ 1505.05) AND INCLUDING THE REQUIREMENTS OF NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30th.

GENERAL CONSTRUCTION PLANNING AND SELECTION OF STRATEGIES TO CONTROL EROSION AND SEDIMENT ON HIGHWAY CONSTRUCTION PROJECTS

3. PLAN ACTIVITIES TO ACCOUNT FOR SENSITIVE SITE CONDITIONS:
 - 3.1. CLEARLY FLAG AREAS TO BE PROTECTED IN THE FIELD AND PROVIDE CONSTRUCTION BARRIERS TO PREVENT TRAFFICKING OUTSIDE OF WORK AREAS.
 - 3.2. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS.
 - 3.3. PROTECT AND MAXIMIZE EXISTING NATIVE VEGETATION AND NATURAL FOREST BUFFERS BETWEEN CONSTRUCTION ACTIVITY AND SENSITIVE AREAS.
 - 3.4. WHEN WORK IS PERFORMED IN AND NEAR WATER COURSES, STREAM FLOW DIVERSION METHODS SHALL BE IMPLEMENTED PRIOR TO ANY EXCAVATION OR FILLING.
 - 3.5. WHEN WORK IS PERFORMED WITHIN 50 FEET OF SURFACE WATERS (WETLAND, OPEN WATER OR FLOWING WATER), PERIMETER CONTROL SHALL BE ENHANCED CONSISTENT WITH SECTION 2.1.2.1. OF THE 2012 NPDES CONSTRUCTION GENERAL PERMIT.
4. MINIMIZE THE AMOUNT OF EXPOSED SOIL:
 - 4.1. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS. MINIMIZE THE AREA OF EXPOSED SOIL AT ANY ONE TIME. PHASING SHALL BE USED TO REDUCE THE AMOUNT AND DURATION OF SOIL EXPOSED TO THE ELEMENTS AND VEHICLE TRACKING.
 - 4.2. UTILIZE TEMPORARY MULCHING OR PROVIDE ALTERNATE TEMPORARY STABILIZATION ON EXPOSED SOILS IN ACCORDANCE WITH TABLE 1.
 - 4.3. THE MAXIMUM AMOUNT OF DISTURBED EARTH SHALL NOT EXCEED A TOTAL OF 5 ACRES FROM MAY 1st THROUGH NOVEMBER 30th, OR EXCEED ONE ACRE DURING WINTER MONTHS, UNLESS THE CONTRACTOR DEMONSTRATES TO THE DEPARTMENT THAT THE ADDITIONAL AREA OF DISTURBANCE IS NECESSARY TO MEET THE CONTRACTORS CRITICAL PATH METHOD SCHEDULE (CPM), AND THE CONTRACTOR HAS ADEQUATE RESOURCES AVAILABLE TO ENSURE THAT ENVIRONMENTAL COMMITMENTS WILL BE MET.
5. CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT:
 - 5.1. DIVERT OFF SITE RUNOFF OR CLEAN WATER AWAY FROM THE CONSTRUCTION ACTIVITY TO REDUCE THE VOLUME THAT NEEDS TO BE TREATED ON SITE.
 - 5.2. DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM DISTURBED AREAS, SLOPES, AND AROUND ACTIVE WORK AREAS AND TO A STABILIZED OUTLET LOCATION.
 - 5.3. CONSTRUCT IMPERMEABLE BARRIERS AS NECESSARY TO COLLECT OR DIVERT CONCENTRATED FLOWS FROM WORK OR DISTURBED AREAS.
 - 5.4. STABILIZE, TO APPROPRIATE ANTICIPATED VELOCITIES, CONVEYANCE CHANNELS OR PUMPING SYSTEMS NEEDED TO CONVEY CONSTRUCTION STORMWATER TO BASINS AND DISCHARGE LOCATIONS PRIOR TO USE.
 - 5.5. DIVERT OFF-SITE WATER THROUGH THE PROJECT IN AN APPROPRIATE MANNER SO NOT TO DISTURB THE UPSTREAM OR DOWNSTREAM SOILS, VEGETATION OR HYDROLOGY BEYOND THE PERMITTED AREA.
6. PROTECT SLOPES:
 - 6.1. INTERCEPT AND DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED AND NEWLY ESTABLISHED AREAS AND SLOPES TO A STABILIZED OUTLET OR CONVEYANCE.
 - 6.2. CONSIDER HOW GROUNDWATER SEEPAGE ON CUT SLOPES MAY IMPACT SLOPE STABILITY AND INCORPORATE APPROPRIATE MEASURES TO MINIMIZE EROSION.
 - 6.3. CONVEY STORMWATER DOWN THE SLOPE IN A STABILIZED CHANNEL OR SLOPE DRAIN.
 - 6.4. THE OUTER FACE OF THE FILL SLOPE SHOULD BE IN A LOOSE RUFFLED CONDITION PRIOR TO TURF ESTABLISHMENT. TOPSOIL OR HUMUS LAYERS SHALL BE TRACKED UP AND DOWN THE SLOPE, DISKED, HARROWED, DRAGGED WITH A CHAIN OR MAT, MACHINE-RAKED, OR HAND-WORKED TO PRODUCE A RUFFLED SURFACE.
7. ESTABLISH STABILIZED CONSTRUCTION EXITS:
 - 7.1. INSTALL AND MAINTAIN CONSTRUCTION EXITS, ANYWHERE TRAFFIC LEAVES A CONSTRUCTION SITE ONTO A PUBLIC RIGHT-OF-WAY.
 - 7.2. SWEEP ALL CONSTRUCTION RELATED DEBRIS AND SOIL FROM THE ADJACENT PAVED ROADWAYS AS NECESSARY.
8. PROTECT STORM DRAIN INLETS:
 - 8.1. DIVERT SEDIMENT LADEN WATER AWAY FROM INLET STRUCTURES TO THE EXTENT POSSIBLE.
 - 8.2. INSTALL SEDIMENT BARRIERS AND SEDIMENT TRAPS AT INLETS TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
 - 8.3. CLEAN CATCH BASINS, DRAINAGE PIPES, AND CULVERTS IF SIGNIFICANT SEDIMENT IS DEPOSITED.
 - 8.4. DROP INLET SEDIMENT BARRIERS SHOULD NEVER BE USED AS THE PRIMARY MEANS OF SEDIMENT CONTROL AND SHOULD ONLY BE USED TO PROVIDE AN ADDITIONAL LEVEL OF PROTECTION TO STRUCTURES AND DOWN-GRADIENT SENSITIVE RECEPTORS.
9. SOIL STABILIZATION:
 - 9.1. WITHIN THREE DAYS OF THE LAST ACTIVITY IN AN AREA, ALL EXPOSED SOIL AREAS, WHERE CONSTRUCTION ACTIVITIES ARE COMPLETE, SHALL BE STABILIZED.
 - 9.2. IN ALL AREAS, TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED IN ACCORDANCE WITH THE STABILIZATION REQUIREMENTS (SECTION 2.2) OF THE 2012 CGP. (SEE TABLE 1 FOR GUIDANCE ON THE SELECTION OF TEMPORARY SOIL STABILIZATION MEASURES.)
 - 9.3. EROSION CONTROL SEED MIX SHALL BE SOWN IN ALL INACTIVE CONSTRUCTION AREAS THAT WILL NOT BE PERMANENTLY SEEDED WITHIN TWO WEEKS OF DISTURBANCE AND PRIOR TO SEPTEMBER 15th OF ANY GIVEN YEAR, IN ORDER TO ACHIEVE VEGETATIVE STABILIZATION PRIOR TO THE END OF THE GROWING SEASON.
 - 9.4. SOIL TACKIFIERS MAY BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND REAPPLIED AS NECESSARY TO MINIMIZE SOIL AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.
10. RETAIN SEDIMENT ON-SITE AND CONTROL DEWATERING PRACTICES:
 - 10.1. TEMPORARY SEDIMENT BASINS (CGP-SECTION 2.1.3.2) OR SEDIMENT TRAPS (ENV-WQ 1506.10) SHALL BE SIZED TO RETAIN, ON SITE, THE VOLUME OF A 2-YEAR 24-HOUR STORM EVENT FOR ANY AREA OF DISTURBANCE OR 3,600 CUBIC FEET OF STORMWATER RUNOFF PER ACRE OF DISTURBANCE, WHICHEVER IS GREATER. TEMPORARY SEDIMENT BASINS USED TO TREAT STORMWATER RUNOFF FROM AREAS GREATER THAN 5-ACRES OF DISTURBANCE SHALL BE SIZED TO ALSO CONTROL STORMWATER RUNOFF FROM A 10-YEAR 24 HOUR STORM EVENT. ON-SITE RETENTION OF THE 10-YEAR 24-HOUR EVENT IS NOT REQUIRED.
 - 10.2. CONSTRUCT AND STABILIZE DEWATERING INFILTRATION BASINS PRIOR TO ANY EXCAVATION THAT MAY REQUIRE DEWATERING.
 - 10.3. TEMPORARY SEDIMENT BASINS OR TRAPS SHALL BE PLACED AND STABILIZED AT LOCATIONS WHERE CONCENTRATED FLOW (CHANNELS AND PIPES) DISCHARGE TO THE SURROUNDING ENVIRONMENT FROM AREAS OF UNSTABILIZED EARTH DISTURBING ACTIVITIES.

11. ADDITIONAL EROSION AND SEDIMENT CONTROL GENERAL PRACTICES:
 - 11.1. USE TEMPORARY MULCHING, PERMANENT MULCHING, TEMPORARY VEGETATIVE COVER, AND PERMANENT VEGETATIVE COVER TO REDUCE THE NEED FOR DUST CONTROL. USE MECHANICAL SWEEPERS ON PAVED SURFACES WHERE NECESSARY TO PREVENT DUST BUILDUP. APPLY WATER, OR OTHER DUST INHIBITING AGENTS OR TACKIFIERS, AS APPROVED BY THE NHDES.
 - 11.2. ALL STOCKPILES SHALL BE CONTAINED WITH TEMPORARY PERIMETER CONTROLS. INACTIVE SOIL STOCKPILES SHOULD BE PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY EROSION CONTROL SEED MIX AND MULCH, SOIL BINDER) OR COVERED WITH ANCHORED TARPS.
 - 11.3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH SECTION 645 OF NHDOT SPECIFICATIONS, WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 IN. OF RAIN PER 24-HOUR PERIOD. EROSION AND SEDIMENT CONTROL MEASURES WILL ALSO BE INSPECTED IN ACCORDANCE WITH THE GUIDANCE MEMO FROM THE NHDES CONTAINED WITHIN THE CONTRACT PROPOSAL AND THE EPA CONSTRUCTION GENERAL PERMIT.
 - 11.4. THE CONTRACTOR SHOULD UTILIZE STORM DRAIN INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING A STORM DRAINAGE SYSTEM PRIOR TO THE PERMANENT STABILIZATION OF THE CONTRIBUTING DISTURBED AREA.
 - 11.5. PERMANENT STABILIZATION MEASURES WILL BE CONSTRUCTED AND MAINTAINED IN LOCATIONS AS SHOWN ON THE CONSTRUCTION PLANS TO STABILIZE AREAS. VEGETATIVE STABILIZATION SHALL NOT BE CONSIDERED PERMANENTLY STABILIZED UNTIL VEGETATIVE GROWTH COVERS AT LEAST 85% OF THE DISTURBED AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER PROJECT COMPLETION.
 - 11.6. CATCH BASINS: CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT ENTER ANY EXISTING CATCH BASINS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE TEMPORARY STONE INLET PROTECTION OVER INLETS IN AREAS OF SOIL DISTURBANCE THAT ARE SUBJECT TO SEDIMENT CONTAMINATION.
 - 11.7. TEMPORARY AND PERMANENT DITCHES SHALL BE CONSTRUCTED, STABILIZED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE SCOUR. TEMPORARY AND PERMANENT DITCHES SHALL BE DIRECTED TO DRAIN TO SEDIMENT BASINS OR STORM WATER COLLECTION AREAS.
 - 11.8. WINTER EXCAVATION AND EARTHWORK ACTIVITIES NEED TO BE LIMITED IN EXTENT AND DURATION, TO MINIMIZE POTENTIAL EROSION AND SEDIMENTATION IMPACTS. THE AREA OF EXPOSED SOIL SHALL BE LIMITED TO ONE ACRE, OR THAT WHICH CAN BE STABILIZED AT THE END OF EACH DAY UNLESS A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY THE DEPARTMENT.
 - 11.9. CHANNEL PROTECTION MEASURES SHALL BE SUPPLEMENTED WITH PERIMETER CONTROL MEASURES WHEN THE DITCH LINES OCCUR AT THE BOTTOM OF LONG FILL SLOPES. THE PERIMETER CONTROLS SHALL BE INSTALLED ON THE FILL SLOPE TO MINIMIZE THE POTENTIAL FOR FILL SLOPE SEDIMENT DEPOSITS IN THE DITCH LINE.

BEST MANAGEMENT PRACTICES (BMP) BASED ON AMOUNT OF OPEN CONSTRUCTION AREA

12. STRATEGIES SPECIFIC TO OPEN AREAS LESS THAN 5 ACRES:
 - 12.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500: ALTERATION OF TERRAIN FOR CONSTRUCTION AND USE ALL CONVENTIONAL BMP STRATEGIES.
 - 12.2. SLOPES STEEPER THAN 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING.
 - 12.3. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT ALONE.
 - 12.4. AREAS WHERE HAUL ROADS ARE CONSTRUCTED AND STORMWATER CANNOT BE TREATED THE DEPARTMENT WILL CONSIDER INFILTRATION.
 - 12.5. FOR HAUL ROADS ADJACENT TO SENSITIVE ENVIRONMENTAL AREAS OR STEEPER THAN 5%, THE DEPARTMENT WILL CONSIDER USING EROSION STONE, CRUSHED GRAVEL, OR CRUSHED STONE BASE TO HELP MINIMIZE EROSION ISSUES.
 - 12.6. ALL AREAS THAT CAN BE STABILIZED SHALL BE STABILIZED PRIOR TO OPENING UP NEW TERRITORY.
 - 12.7. DETENTION BASINS SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE A 2 YEAR STORM EVENT.
13. STRATEGIES SPECIFIC TO OPEN AREAS BETWEEN 5 AND 10 ACRES:
 - 13.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES WILL BE UTILIZED.
 - 13.2. DETENTION BASINS WILL BE CONSTRUCTED TO ACCOMMODATE THE 2-YEAR 24-HOUR STORM EVENT AND CONTROL A 10-YEAR 24-HOUR STORM EVENT.
 - 13.3. SLOPES STEEPER THAN A 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS. OTHER ALTERNATIVE MEASURES, SUCH AS BONDED FIBER MATRIXES (BFMS) OR FLEXIBLE GROWTH MEDIUMS (FGMS) MAY BE UTILIZED, IF MEETING THE NHDES APPROVALS AND REGULATIONS.
 - 13.4. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS.
14. STRATEGIES SPECIFIC TO OPEN AREAS OVER 10 ACRES:
 - 14.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES AND BETWEEN 5 AND 10 ACRES WILL BE UTILIZED.
 - 14.2. THE DEPARTMENT ANTICIPATES THAT SOIL BINDERS WILL BE NEEDED ON ALL SLOPES STEEPER THAN 3:1, IN ORDER TO MINIMIZE EROSION AND REDUCE THE AMOUNT OF SEDIMENT IN THE STORMWATER TREATMENT BASINS.
 - 14.3. THE CONTRACTOR WILL BE REQUIRED TO HAVE AN APPROVED DESIGN IN ACCORDANCE WITH ENV-WQ 1506.12 FOR AN ACTIVE FLOCCULANT TREATMENT SYSTEM TO TREAT AND RELEASE WATER CAPTURED IN STORM WATER BASINS. THE CONTRACTOR SHALL ALSO RETAIN THE SERVICES OF AN ENVIRONMENTAL CONSULTANT WHO HAS DEMONSTRATED EXPERIENCE IN THE DESIGN OF FLOCCULANT TREATMENT SYSTEMS. THE CONSULTANT WILL ALSO BE RESPONSIBLE FOR THE IMPLEMENTATION AND MONITORING OF THE SYSTEM.

TABLE 1
GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES

APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES ²				ROLLED EROSION CONTROL BLANKETS ³			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCSB
SLOPES ¹												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES	YES	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1 SLOPE	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO
4:1 SLOPE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
WINTER STABILIZATION												
4T/AC	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
CHANNELS												
LOW FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
HIGH FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNSCB	2 NET STRAW-COCONUT BLANKET
CB	COMPOST BLANKET	FRM	FIBER REINFORCED MEDIUM	DNCSB	2 NET COCONUT BLANKET

- NOTES:
1. ALL SLOPE STABILIZATION OPTIONS ASSUME A SLOPE LENGTH ≤10 TIMES THE HORIZONTAL DISTANCE COMPONENT OF THE SLOPE, IN FEET.
 2. PRODUCTS CONTAINING POLYACRYLAMIDE (PAM) SHALL NOT BE APPLIED DIRECTLY TO OR WITHIN 100 FEET OF ANY SURFACE WATER WITHOUT PRIOR WRITTEN APPROVAL FROM THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
 3. ALL EROSION CONTROL BLANKETS SHALL BE MADE WITH WILDLIFE FRIENDLY BIODEGRADABLE NETTING.

STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
WETLAND PLANS			
EROSION CONTROL STRATEGIES			
AND STABILIZATION MATRIX			
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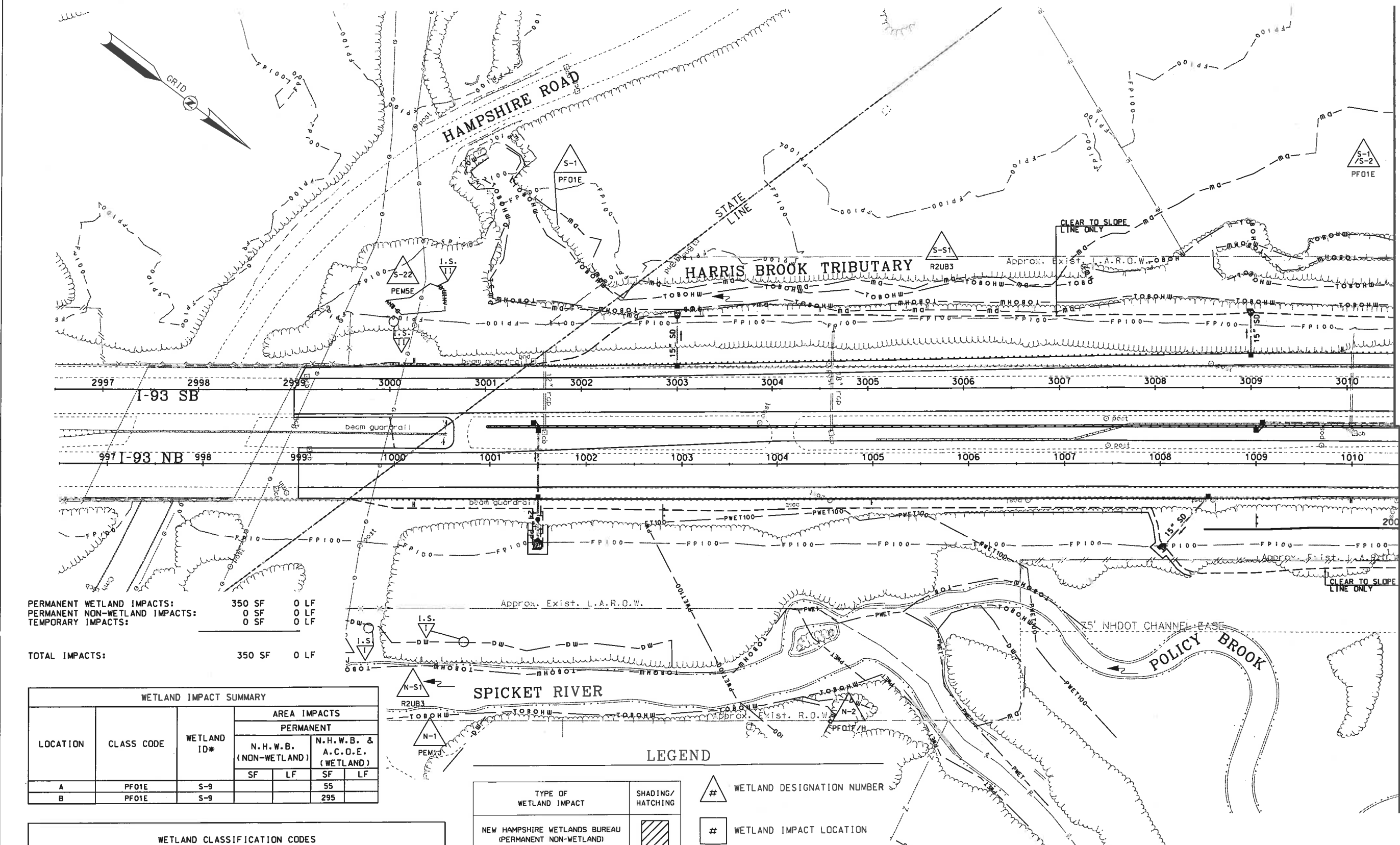
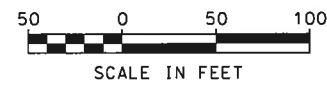
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 DATE 7/2018
 DATE 11/16/2018
 DATE 11/16/2018
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 NEW DESIGN VHB TEAM
 SHEET CHECKED J. HILTON
 AS BUILT DETAILS

PERMANENT WETLAND IMPACTS: 350 SF 0 LF
 PERMANENT NON-WETLAND IMPACTS: 0 SF 0 LF
 TEMPORARY IMPACTS: 0 SF 0 LF
 TOTAL IMPACTS: 350 SF 0 LF

WETLAND IMPACT SUMMARY						
LOCATION	CLASS CODE	WETLAND ID*	AREA IMPACTS			
			PERMANENT			
			N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.D.E. (WETLAND)	
			SF	LF	SF	LF
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B	PF01E	S-9			295	

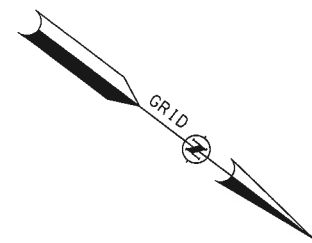
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PF01E	PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED

LEGEND	
TYPE OF WETLAND IMPACT	SHADING/HATCHING
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	
#	WETLAND DESIGNATION NUMBER
#	WETLAND IMPACT LOCATION



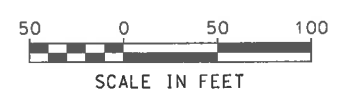
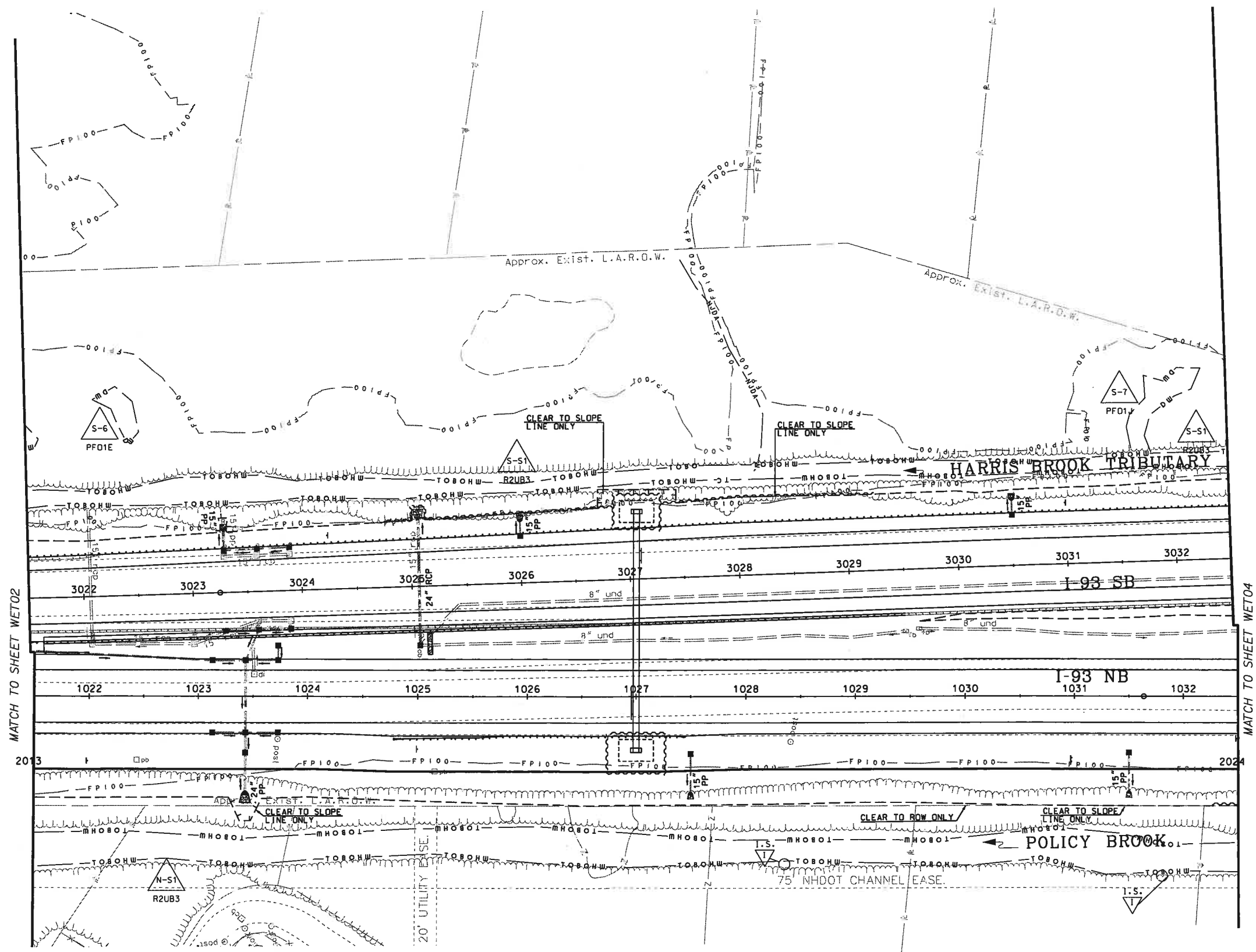
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DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN						
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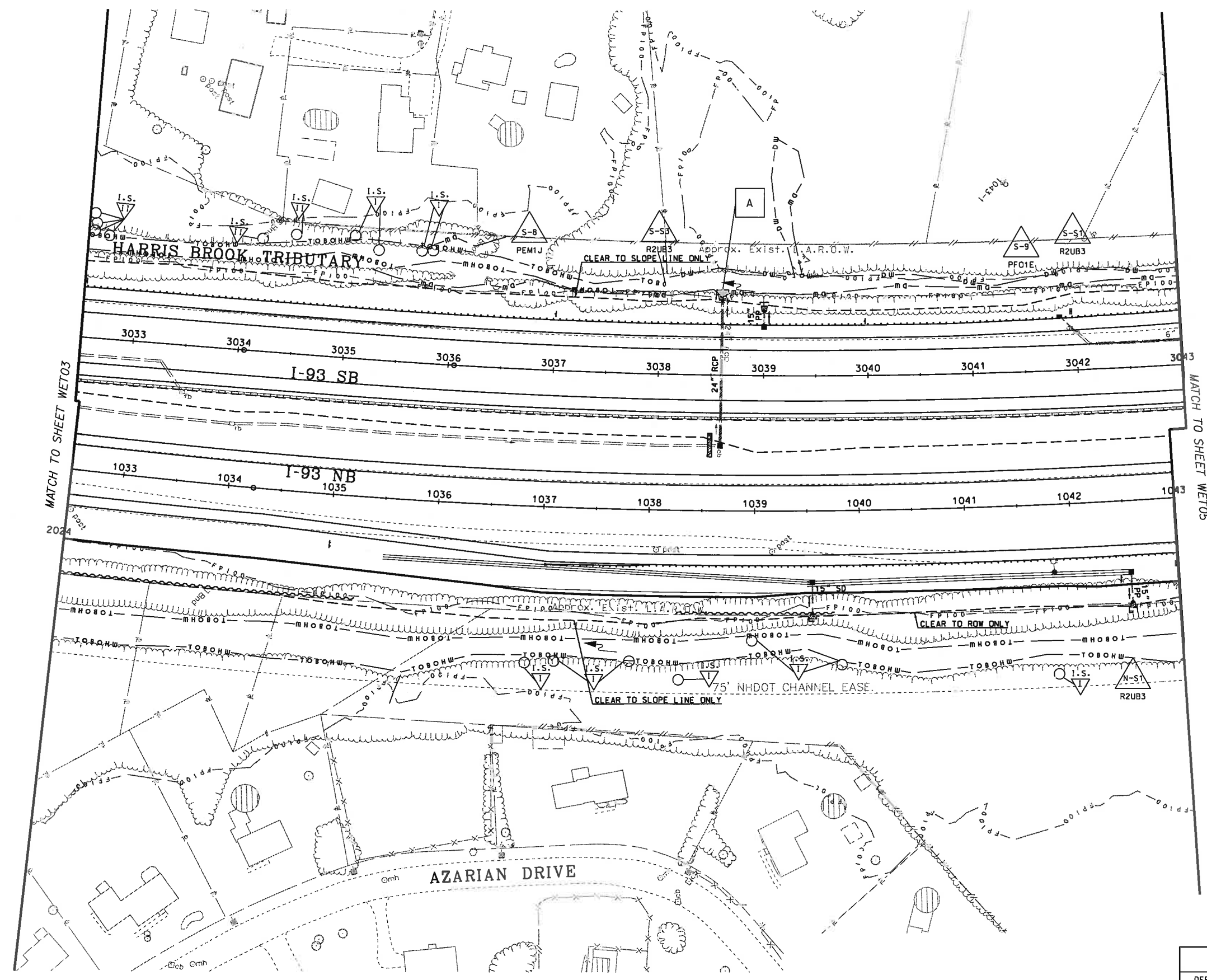
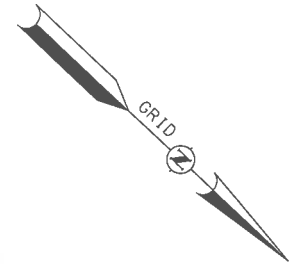


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NEW DESIGN	VHB TEAM	DATE	11/16/2018
SHEET CHECKED	J. HILTON	DATE	11/16/2018
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



STATE OF NEW HAMPSHIRE						
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN						
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REVISIONS AFTER PROPOSAL	NUMBER	DATE	STATION	DESCRIPTION

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AS BUILT DETAILS		DATE	



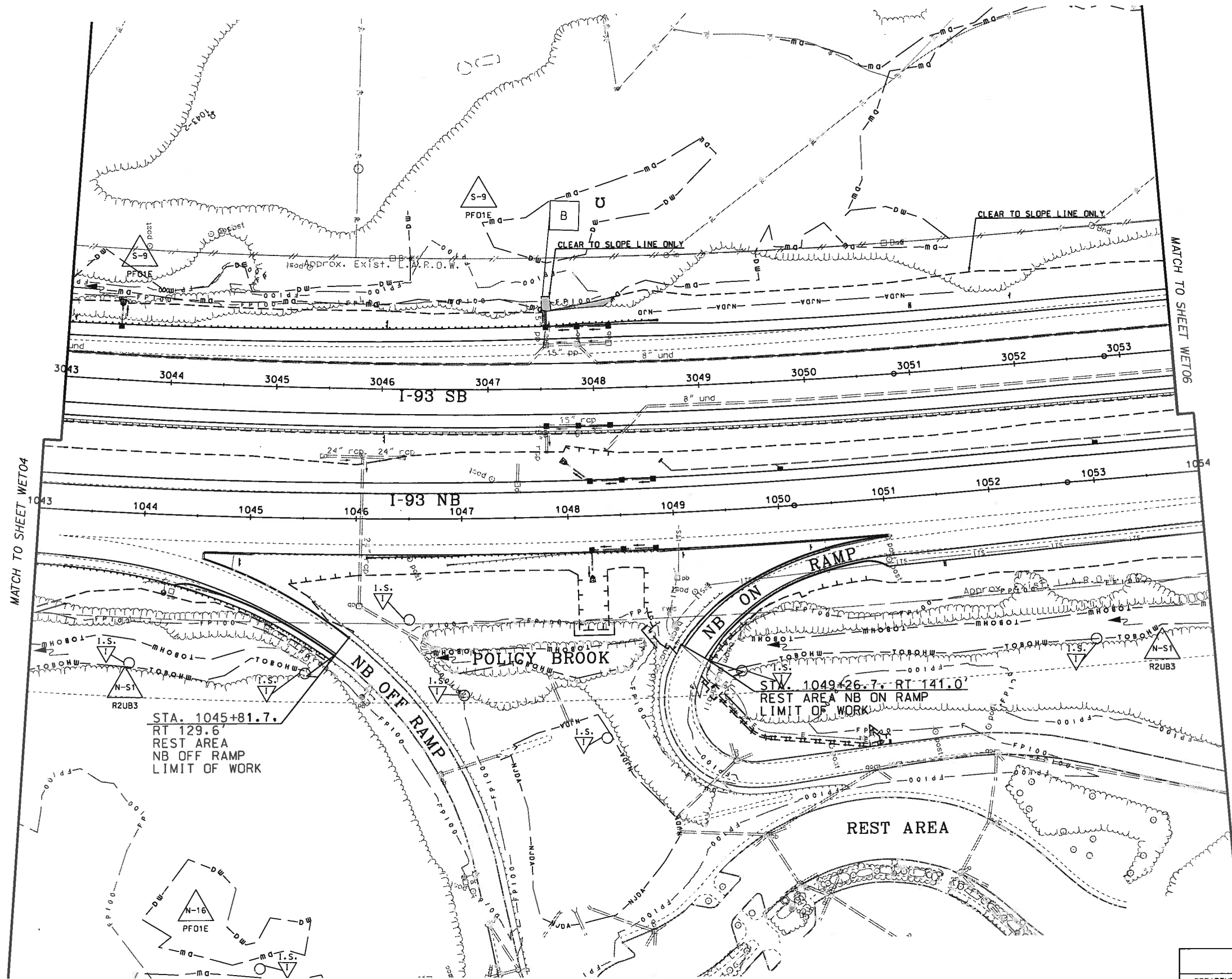
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STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

WETLAND IMPACT PLANS

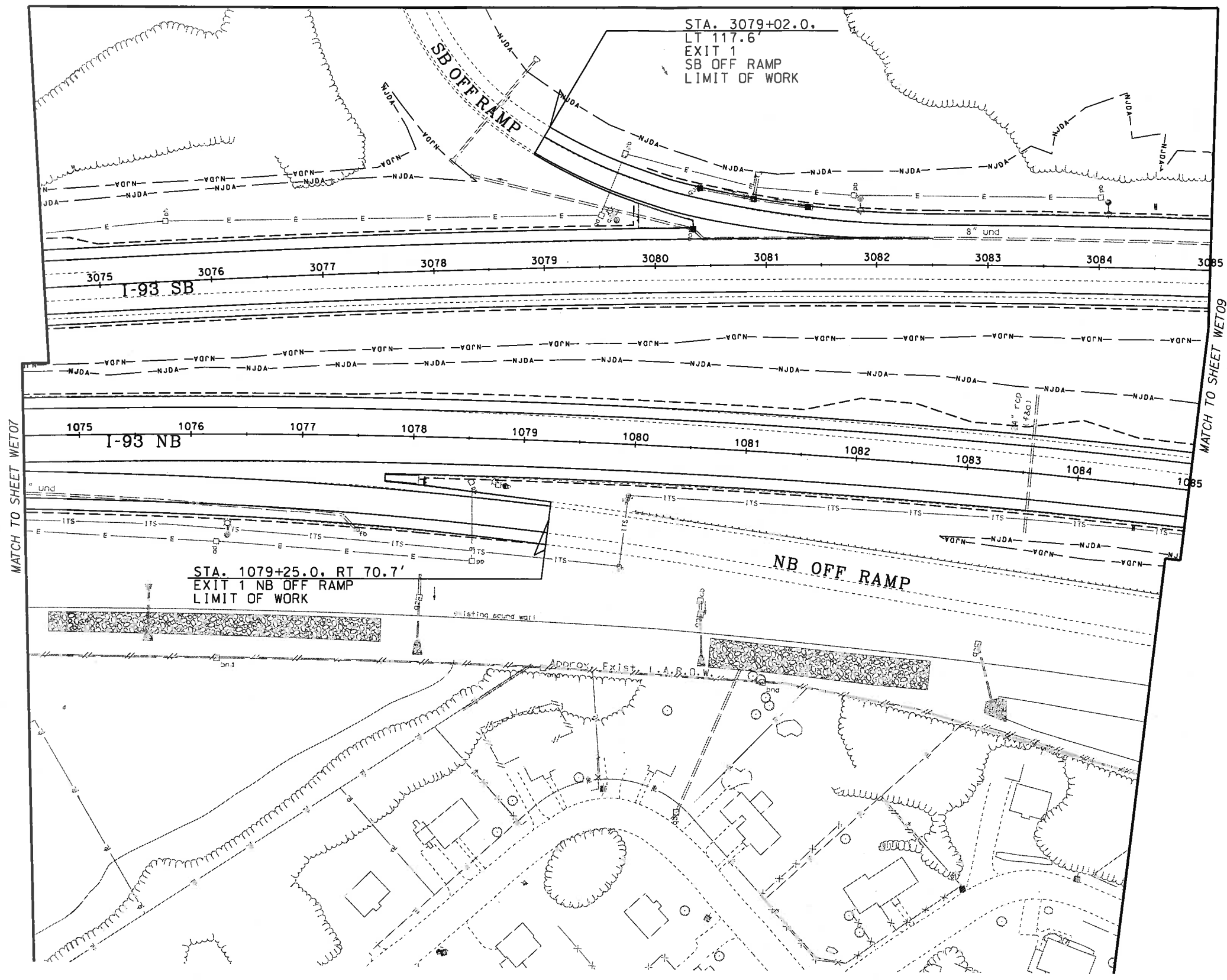
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SHEET CHECKED	J. HILTON	DATE	11/16/2018
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	DESCRIPTION
STATION	
DATE	
NUMBER	



STATE OF NEW HAMPSHIRE						
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN						
WETLAND IMPACT PLANS						
DATE PLOTTED	VHB PROJECT NO.	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
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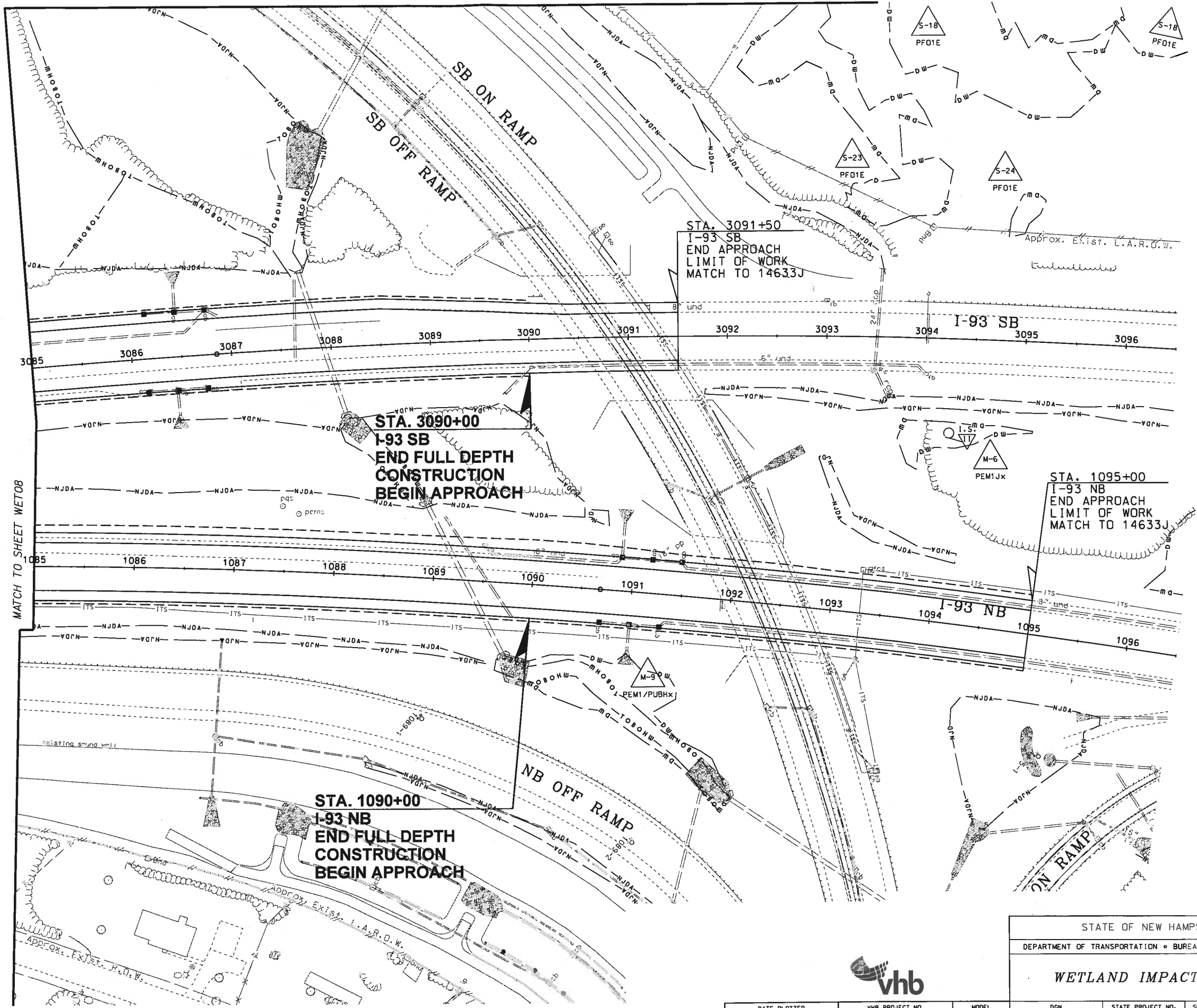
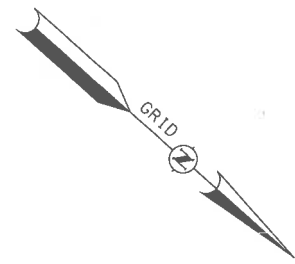
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SHEET CHECKED	J. HILTON	DATE	11/16/2018
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STATE OF NEW HAMPSHIRE						
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN						
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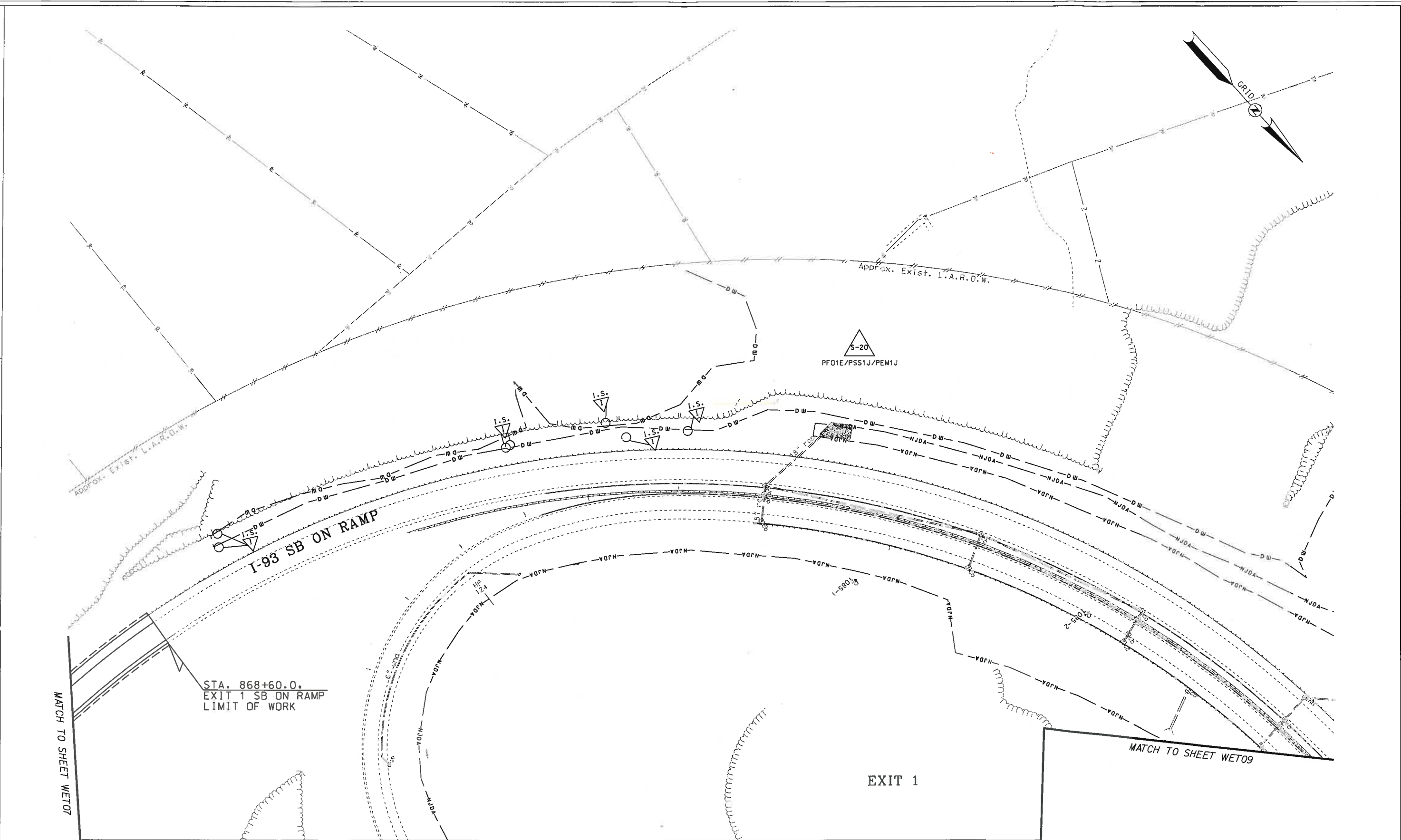
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REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



STATE OF NEW HAMPSHIRE						
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DATE PLOTTED	VHB PROJECT NO.	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
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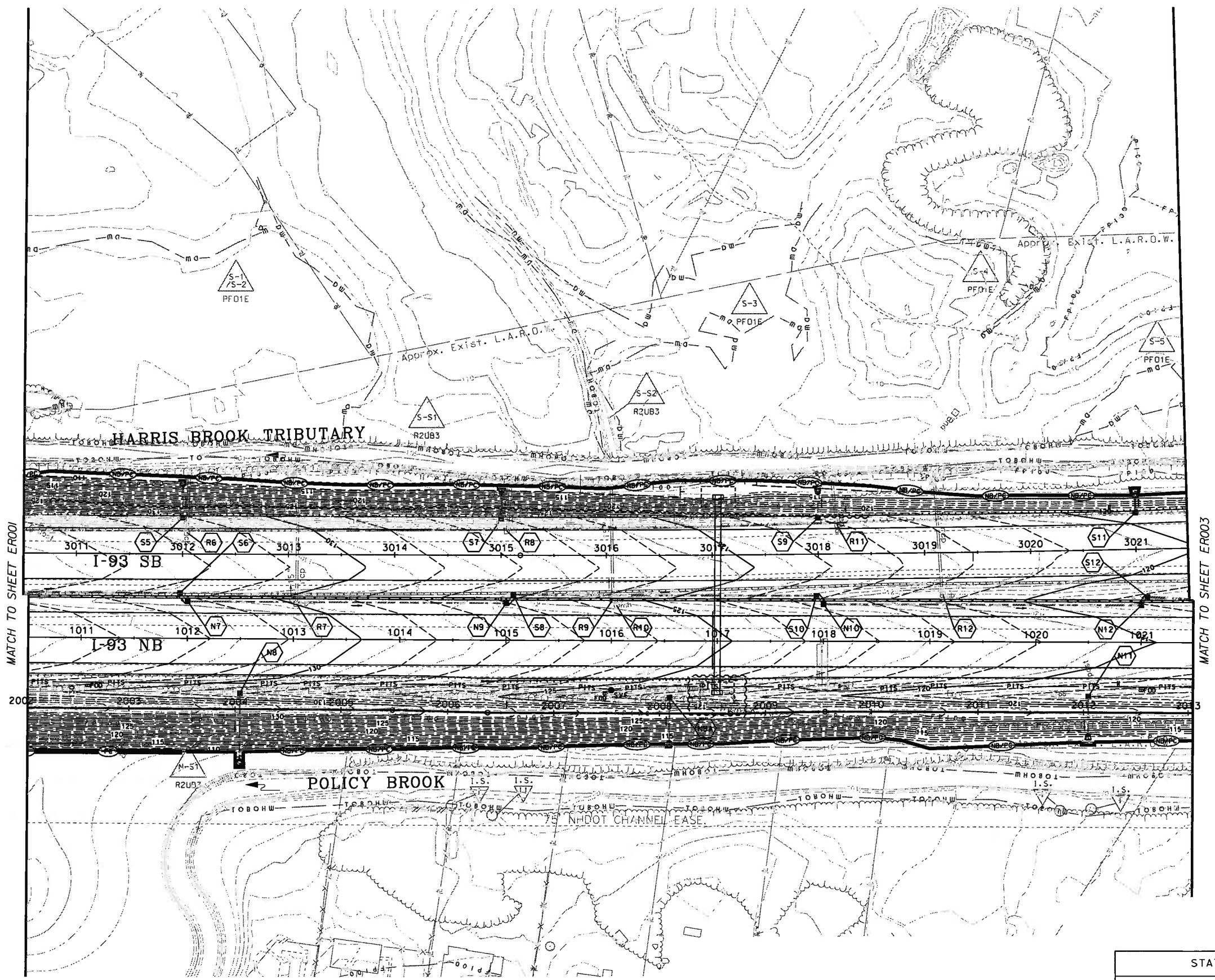
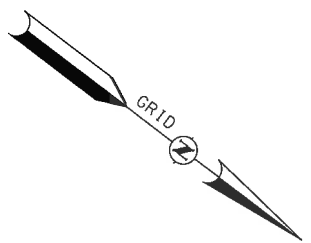
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NUMBER	DATE	STATION	DESCRIPTION

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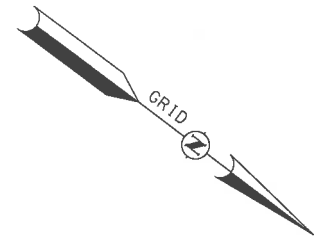
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STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN

DATE PLOTTED	VHB PROJECT NO.	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
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REVISIONS AFTER PROPOSAL		STATION	DESCRIPTION
NUMBER	DATE		

DATE	7/2018
DATE	11/16/2018
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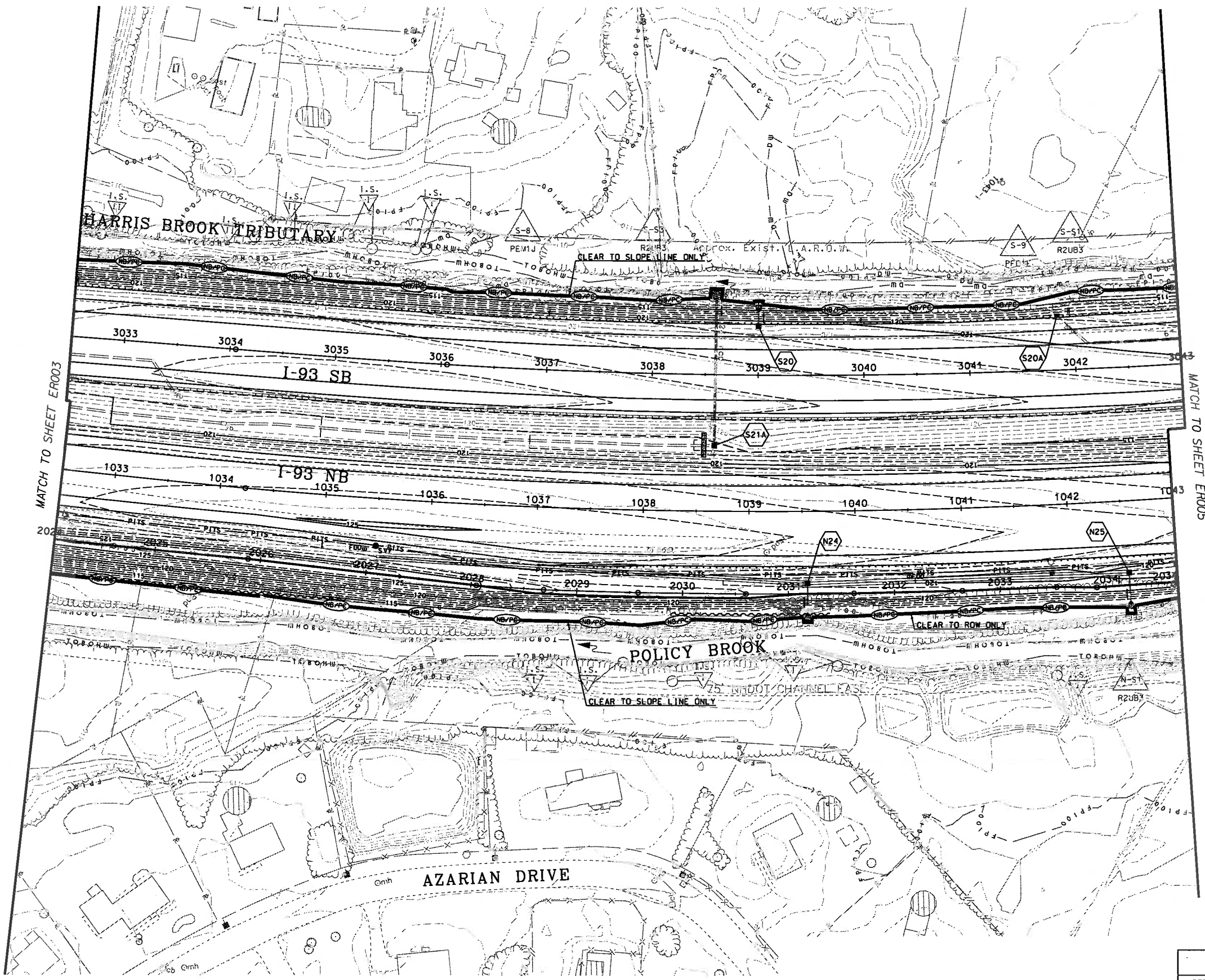
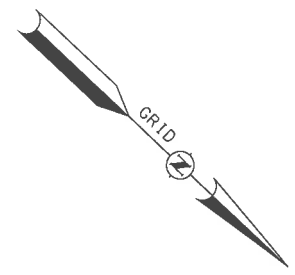


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MATCH TO SHEET ERO04



STATE OF NEW HAMPSHIRE						
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN						
EROSION CONTROL PLAN						
DATE PLOTTED	VHB PROJECT NO.	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
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MATCH TO SHEET ER003

MATCH TO SHEET ER005

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION

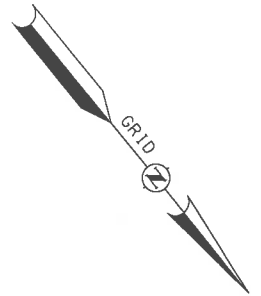
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SHEET CHECKED	J. HILTON	DATE	11/16/2018
AS BUILT DETAILS		DATE	



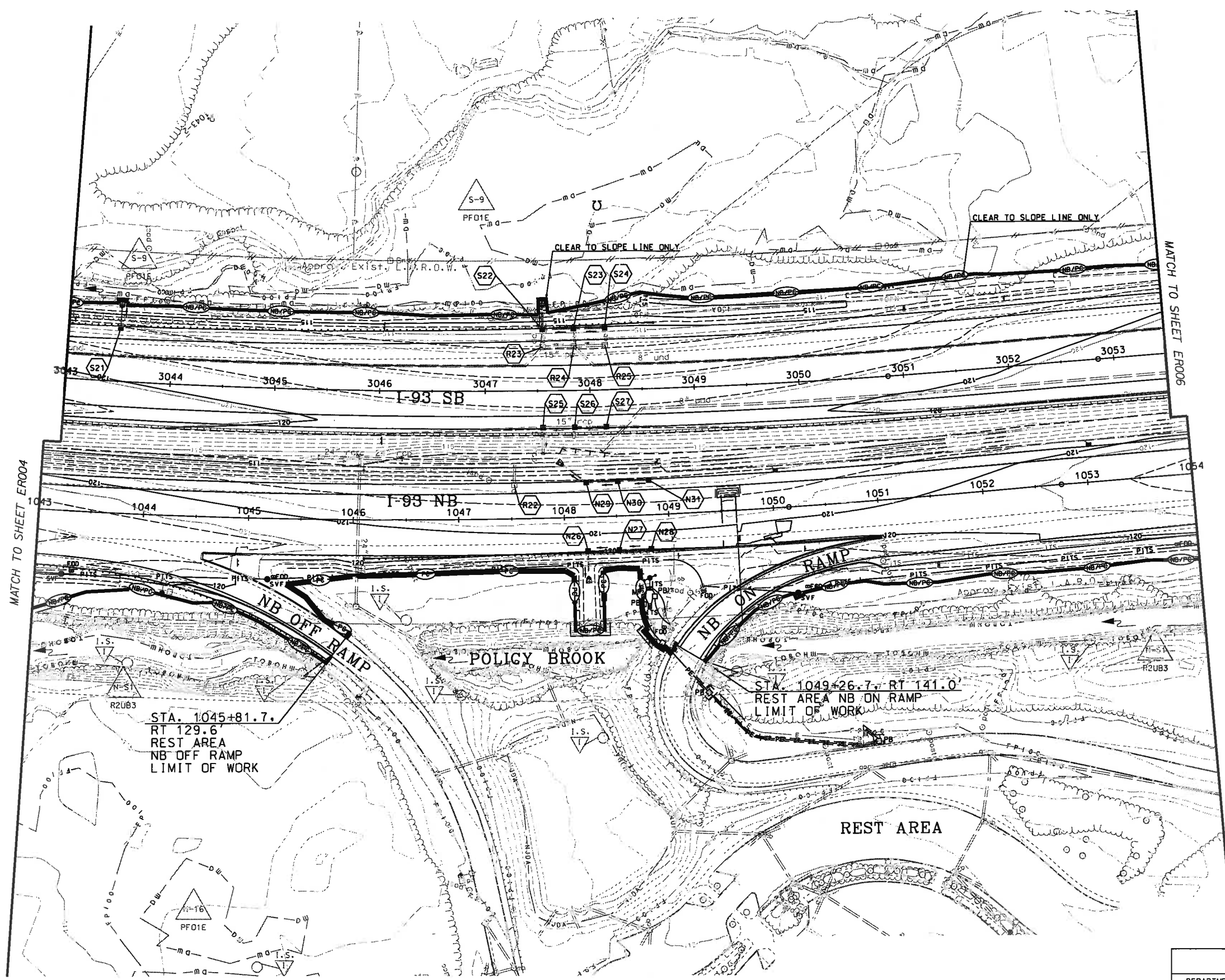
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN

DATE PLOTTED	VHB PROJECT NO.	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
1/4/2019	52541.00	Ero04	13933AERO_Plans.dgn	13933A	19	25



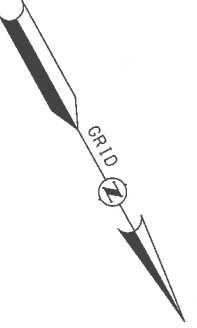
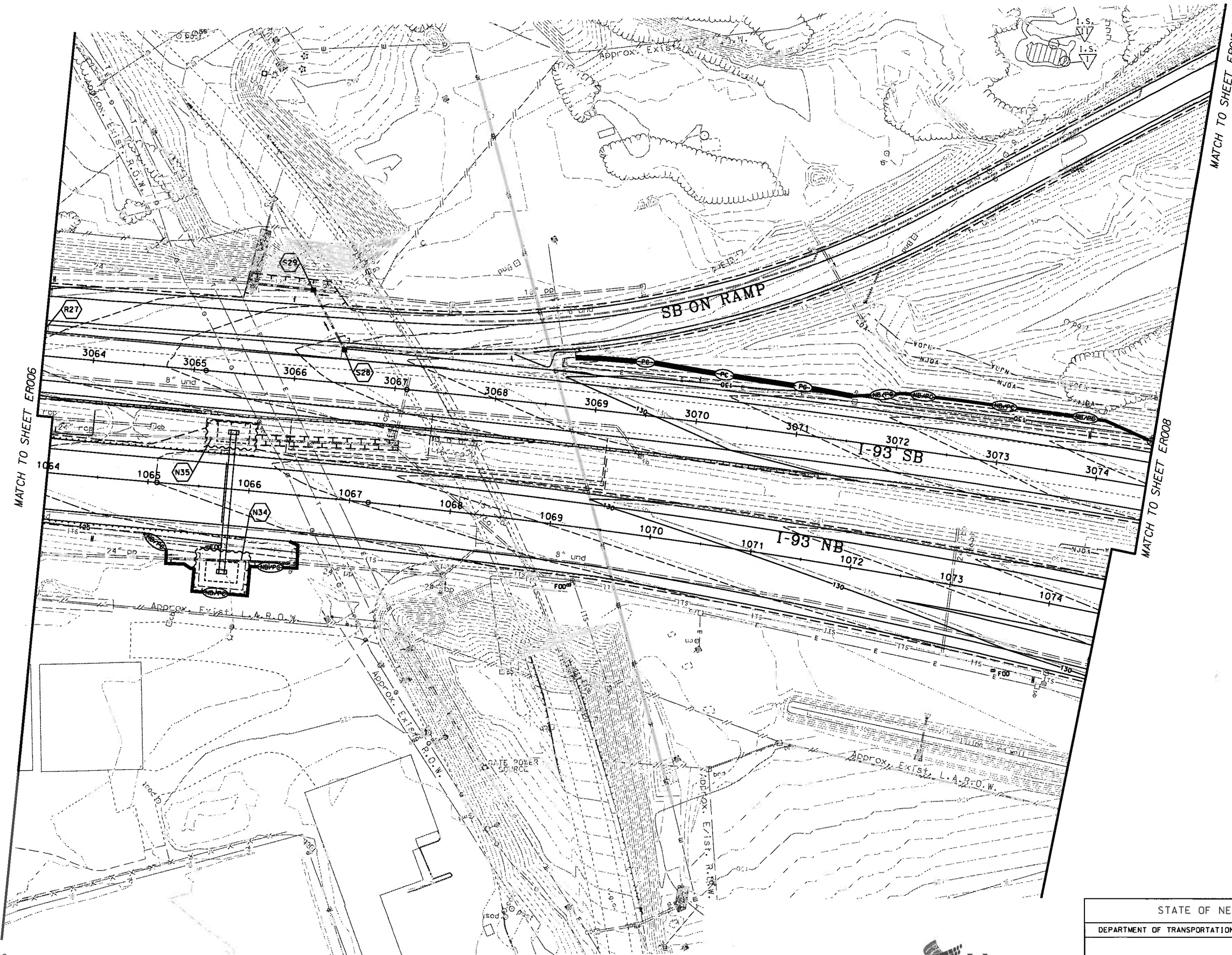
SDR PROCESSED	VHB TEAM	DATE	7/2018
NEW DESIGN	VHB TEAM	DATE	11/16/2018
SHEET CHECKED	J. HILTON	DATE	11/16/2018
AS BUILT DETAILS		DATE	



STATE OF NEW HAMPSHIRE						
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN						
EROSION CONTROL PLAN						
DATE PLOTTED	VHB PROJECT NO.	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
1/4/2019	52541.00	Ero05	13933AERO_Plans.dgn	13933A	20	25

SDR PROCESSED	VHB TEAM	DATE	7/2018
NEW DESIGN	VHB TEAM	DATE	11/16/2018
SHEET CHECKED	J. HILTON	DATE	11/16/2018
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION

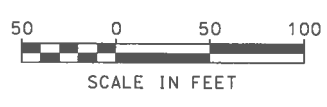
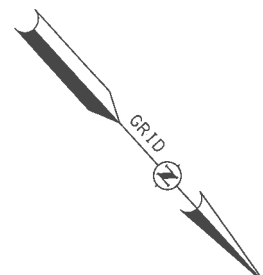
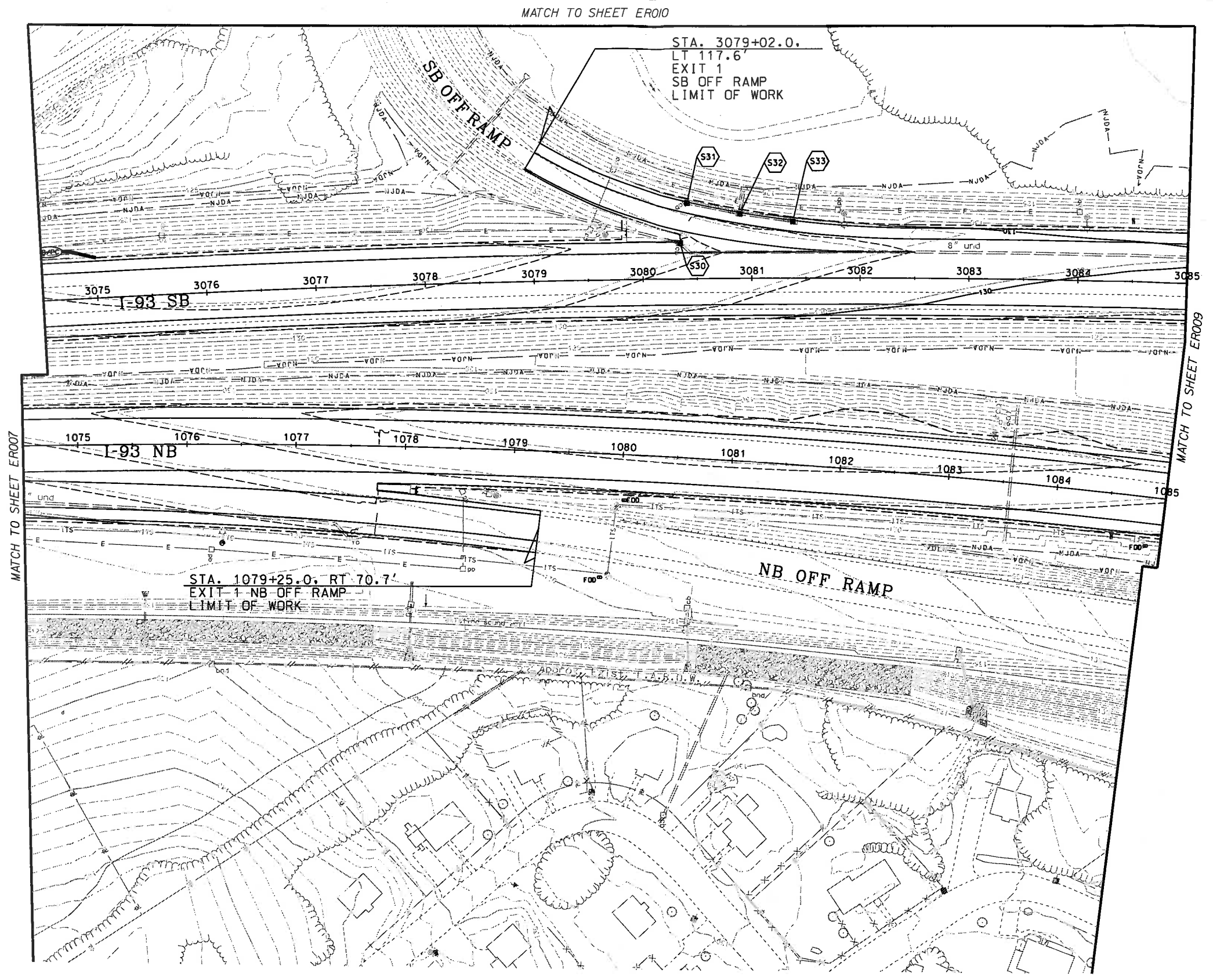


STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN

DATE PLOTTED	VHB PROJECT NO.	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
1/4/2019	52541.00	Ero07	13933AERO_Plans.dgn	13933A	22	25

SDR PROCESSED	VHB TEAM	DATE	7/2018
NEW DESIGN	VHB TEAM	DATE	11/16/2018
SHEET CHECKED	J. HILTON	DATE	11/16/2018
AS BUILT DETAILS		DATE	

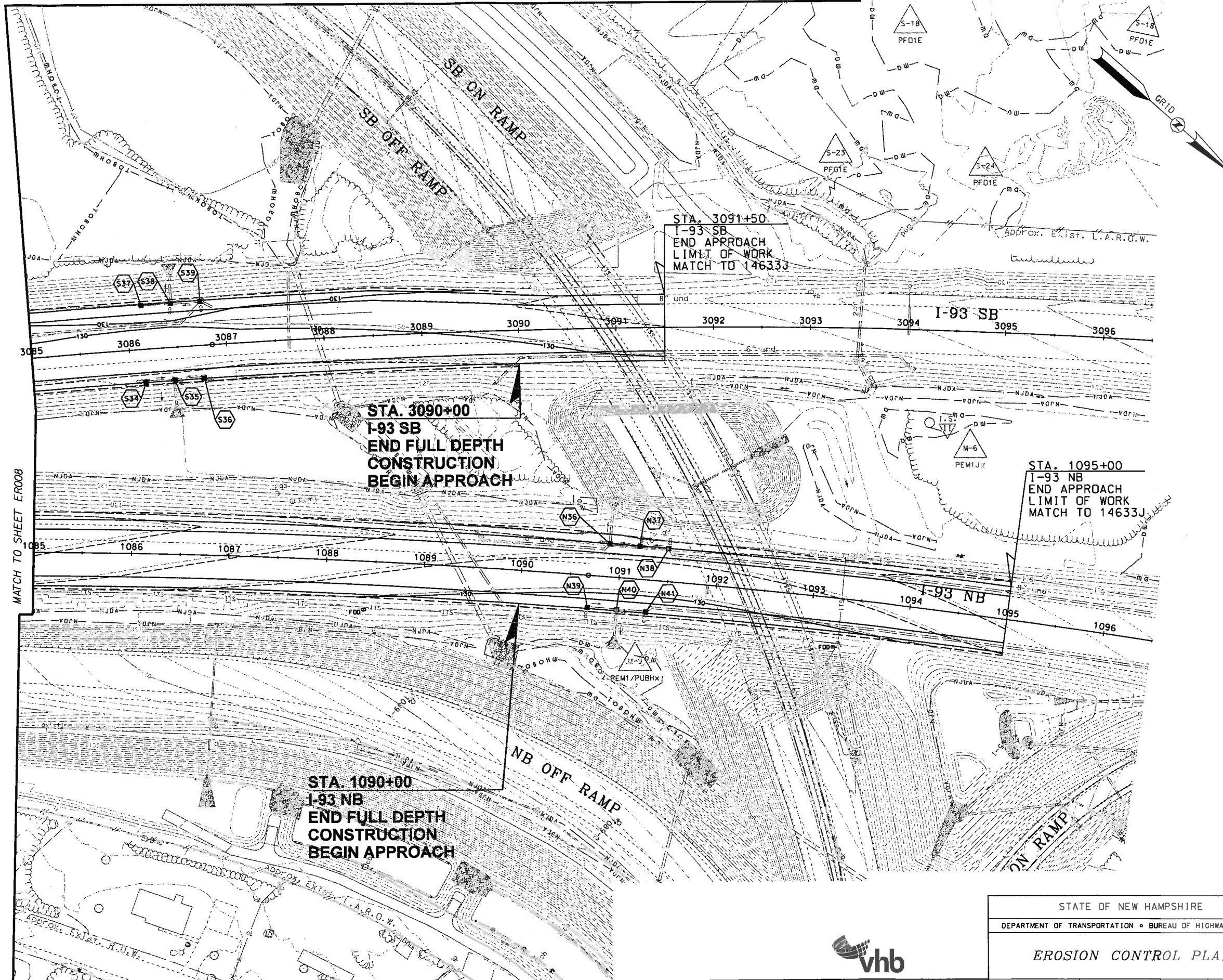


STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN

DATE PLOTTED	VHB PROJECT NO.	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
1/4/2019	52541.00	Ero08	13933AERD_Plans.dgn	13933A	23	25

MATCH TO SHEET ERO10



SDR PROCESSED	DATE	7/2018
	NEW DESIGN	DATE
VHB TEAM	DATE	11/16/2018
	SHEET CHECKED	J. HILTON
AS BUILT DETAILS	DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION

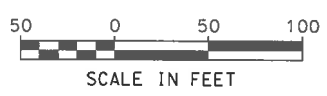
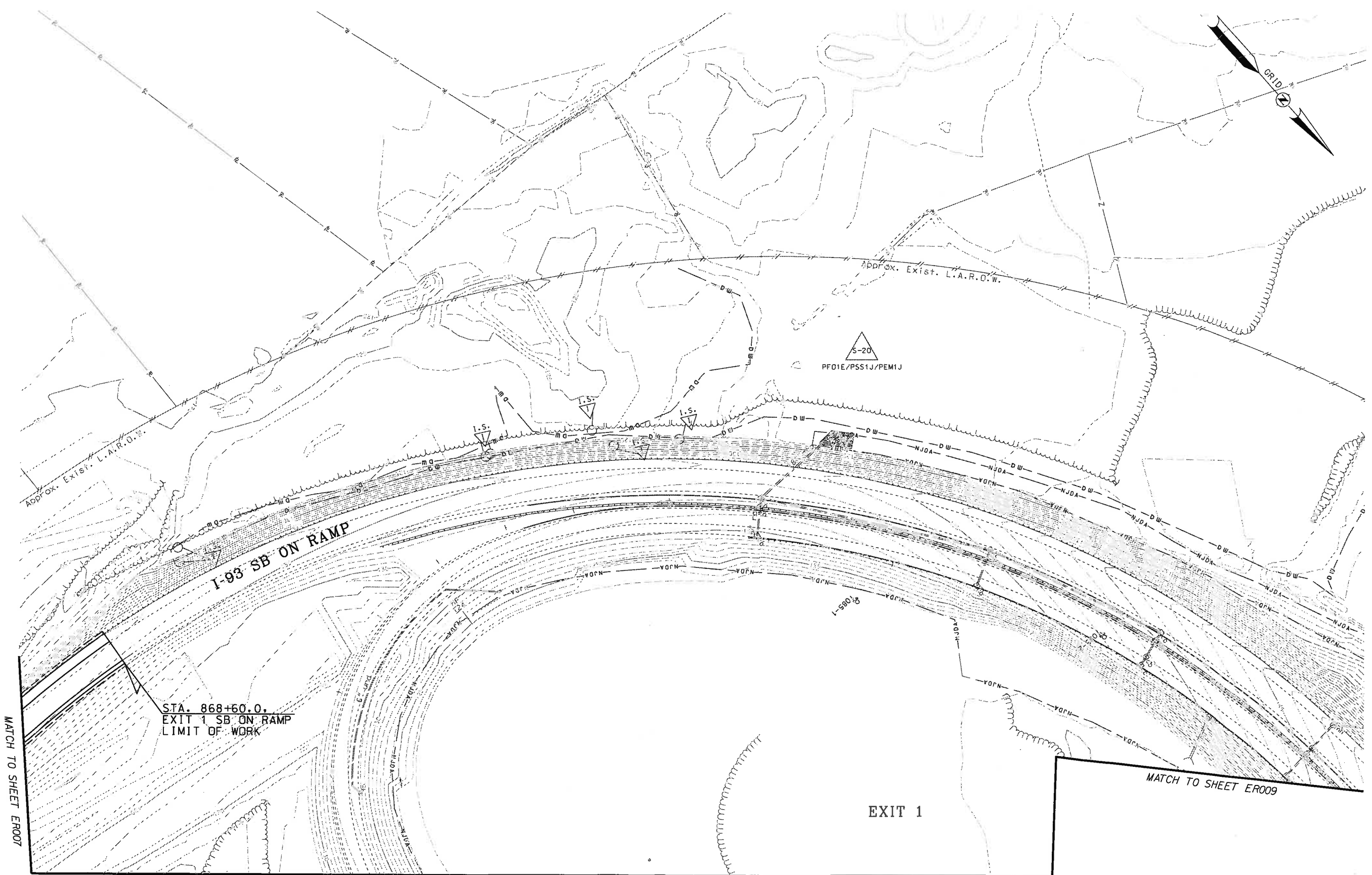


DATE PLOTTED	VHB PROJECT NO.	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
1/4/2019	52541.00	Er009	13933AERO_Plans.dgn	13933A	24	25

STATE OF NEW HAMPSHIRE
 DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN
EROSION CONTROL PLAN

SDR PROCESSED	VHB TEAM	DATE	7/2018
NEW DESIGN	VHB TEAM	DATE	11/16/2018
SHEET CHECKED	J. HILTON	DATE	11/16/2018
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
EROSION CONTROL PLAN			
DATE PLOTTED	VHB PROJECT NO.	MODEL	DGN
1/4/2019	52541.00	Ero010	13933AERO.Plans.dgn
STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS	
13933A	25	25	

MATCH TO SHEET ERO07

MATCH TO SHEET ERO09

MATCH TO SHEET ERO08