

# Standard Wetland Permit Application

Exeter Rose Farm, LLC  
Oak Street Extension  
Exeter, NH

*Town Clerk's Office*

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**Remedial Action Plan** by StoneHill Environmental, Inc. dated December 21, 2017

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**Exeter Planning Board Approval** – Case 17-27, January 14, 2021

**Limited Invasive Species Plan** By TF Moran, Inc. dated August 9, 2018

**Warranty Deed** recorded August 1, 2017

**NH Fish & Game email correspondence** dated October 26, 2018

**Exeter-Squamscott Rivers Local Advisory Committee** email correspondence dated February 23, 2021

**Project Site Plans**

11” X 17” Drainage Structure Improvement Plans by Ross Engineering, LLC dated August 24, 2021, 7 sheets

11” X 17” NHDES Jurisdictional Areas & Impact Plan (Sheet W-01) by TF Moran, Inc. dated August 30, 2021

11’ X 17” Stream Crossing Impact Plan (Sheet W-02) by TF Moran, Inc. dated August 30, 2021

11’ X 17” Stream Crossing Section Plan (Sheet W-03) by TF Moran, Inc. dated August 30, 2021

24” X 36” (of the above plans included with hard copy to NHDES)

11” X 17” Subdivision Plans of Exeter Rose Farm by TF Moran, Inc. dated August 30, 2021 with various revision dates



Via First Class Mail – Certified – 7018 1130 0000 5724 2939

September 22, 2021

Mr. Eben Lewis  
NH Dept. of Environmental Services  
Land Resources Management – Wetlands Bureau  
Pease Tradeport  
222 International Drive, Suite 175  
Portsmouth, N.H. 03801

Re: Exeter Rose Farm, LLC  
Oak Street Extension and Forest Street  
Exeter, NH

Dear Mr. Lewis:

Attached please find a completed standard wetland permit application and supporting attachments for the above-referenced location for your review and approval.

With respect to Env-Wt 311.06(h), the application was discussed at great length with the Exeter Conservation Commission (ECC) in 2018 before it was approved by the Exeter Planning Board (EPB) with support from the ECC. Additional design details have been incorporated into the project design as a result of conditions associated with the local approvals and are described below.

Regarding, Env-Wt 311.06(j), we expect this project will be covered by the general permit but we have had no coordination with the U.S. Army Corps of Engineers regarding this project to date.

Compensatory mitigation per Env-Wt 800 is required because the project proposes impact to a priority resource area (PRA) as per Env-Wt 313.04(a)(1). We have reached out to the town and they are currently preparing a list of “shovel ready” culvert replacement projects. We anticipate that some of these projects may suffice as suitable compensatory mitigation for our project impacts, which primarily involve stream work. If not, or if the list is not ready in time for processing of our permit application, we will pursue mitigation that involves a payment into the Aquatic Resource Mitigation Fund, commonly referred to as the “in-lieu fee” program, and we will calculate the appropriate in-lieu fee that is commensurate with our project impacts.

The impacts to wetland areas B1, B2, B3, C, D, E, F and G are necessitated by the approved remedial action plan (RAP) and as such are conditionally authorized by rule as per NH RSA 482-A:11 VII and administrative rule Env-Wt 309.02(k). Refer to Table 1 below. We have attached a copy of the RAP to this application package. This letter and wetland permit application should be considered notification to the Department under Env-Wt 309.02(k)(2). We have not included these impacts in our calculation of total impacts as it relates to providing compensatory mitigation or calculating application fees.

**Table 1**

Wetland Impact Area	Surface Area in Square Feet (SF)
B1 (partial)	270
B2 (partial)	11
B3 (partial)	731
C	2,633
D	761
E	392
F	10,206
G	276
Total	15,280 SF

Direct wetland alteration proposed by the project includes 3,115 SF of permanent and 3,761 SF of temporary impacts. Wetland impacts are summarized below; organized by the engineering firm that prepared the site plans which depict each proposed impact area. Per our previous communications, we have tallied impacts to stream channels (in linear feet) as temporary where replacement of existing culverts is proposed and as permanent where new closed-bottom culverts are proposed. We have not considered replacement of culverts which existed prior to the current owner/applicant's acquisition of the property as after-the-fact impacts due to their likely age. Impacts to surface waters and banks were tallied as per Env-Wt 407.03(c)(1 and 2).

**TF Moran, Inc. Plans**

The majority of the requested impacts, 3,718 SF, are associated with construction of the primary access road and the crossing of Norris Brook, specifically the installation of the 5' X 24' open bottom box culvert. Approximately 2,045 SF of these impacts are permanent and the remainder, approximately 1,674 SF, are temporary and will be restored-in-place post-construction. The permanent impacts areas (PIA) and temporary impact areas (TIA) are identified as K1 and K2 on plan sheet W-01 prepared by TF Moran. Other impacts depicted on the TF Moran site plans are as follows:

Impact area K3 involves 74 SF of permanent impact and 57 SF of temporary impact associated with placement of and grading for the proposed sewer pump station. The location is dictated to a large degree by topography and the need to capture sewer flows via gravity. The size of this impact is also necessitated, at least in part, by the Town of Exeter's requirements regarding access and placement of a generator.

TIA's K4 and K5, at 21 SF and 10 SF respectfully, are necessitated by proposed stormwater treatment gravel wetland number 4. These temporary impacts involve the placement of the proposed perimeter siltation barriers. (Proposed perimeter siltation barriers for this project typically involve a double row of silt sock). TIA K6, at 32 SF, is necessitated by proposed stormwater treatment gravel wetland number 3. These temporary impacts also involve the placement of the proposed perimeter siltation barriers.

Oak Street Extension is in poor condition. TIA K7, at 12 SF, is necessitated by the proposed improvements to Oak Street Extension that resulted from the planning board process. Like temporary impacts K4-K6, these impacts also involve the placement of the proposed perimeter siltation barriers as needed to protect adjacent wetlands during construction.

Whenever proposed by this project, all temporary wetland impacts and exposed soils will be stabilized upon completion of construction. All temporary impacts will be seeded with New England Erosion Control / Restoration Mix for Moist Sites from New England Wetland Plants. The mix will be applied at the specified rate and mulched or blanketed as appropriate.

**Ross Engineering, LLC Plans**

Other impact quantities included in the total are identified on the site plans prepared by Ross Engineering, LLC. These impacts are summarized below by culvert/impact area and/or wetland (B, J or K). Culverts D2 – D4 involve the replacement of existing culverts beneath Oak Street Extension. The replacement of existing culverts D2 – D4, as

well as other work described below, is mandated by Condition 5 of the planning board approval (Case 17-27 dated January 14, 2019), which required inspection by an engineer and replacement as deemed necessary. The text of Condition 5 is pasted below. Temporary impacts are generally associated with grading to promote or maintain positive drainage and any exposed soils remaining after construction will be stabilized. Permanent impacts, where proposed, generally involve slope stabilization with geotextile fabric and riprap/stone. Refer to the attached stream crossing worksheets for additional information regarding culvert design.

5. The Norris Brook culvert and granite headwall referenced in comment # 17 in the IRC comment letter referenced above shall be further analyzed by a Structural Engineer beyond the initial Drainage Structure Inspection performed by Ross Engineering and dated August 8, 2018 and include design plans of needed repairs. The analysis and design plans shall consider an open box culvert and shall be equipped with a trash rack. The design plans shall be submitted to the Town Engineer for review and approval prior to signing the final plans. The granite headwall shall have a "rock ramp" or similar structure to allow the passage of American eels. The Applicant shall consult with New Hampshire Fish and Game Fisheries Biologists regarding the final design of the "rock ramp" or similar structure intended to improve on and allow for the passage of American eels into the upper Norris Brook watershed.

#### Culvert D1

The area below the outlet of this existing culvert has been the recipient of incidental soil materials from snow plowing and other activities. Additionally, the area is overgrown with dense vegetation. These features have combined to impede flow associated with this culvert. The project proposes to regrade the area to restore positive drainage as per condition 10 of the planning board approval, resulting in temporary wetland impacts of 118 SF in wetland 'K'. The area will be seeded and covered with erosion control blanket to stabilize exposed soils and minimize erosion.

#### Culvert D2

The existing 12" diameter corrugated metal pipe (CMP) that passes beneath Oak Street Extension will be upgraded to plastic pipe, resulting in temporary impacts of 142 SF in wetland 'J' associated with grading to restore positive drainage by removing a plume of accumulated sediment from many years of roadway maintenance.

#### Culvert D3

Temporary impacts of 222 SF in wetland 'J' (upstream) and 447 SF in wetland 'K' (downstream) are associated with the replacement of the existing 24" diameter reinforced concrete pipe (RCP) that passes beneath Oak Street Extension. The RCP sections have separated and will be replaced with another RCP which will be 37 feet in total length.

#### Culvert D4

The existing 36" RCP on Norris Brook has separated and partially collapsed. Additionally, the upstream invert (9.54') is lower than the downstream invert (10.83'), which has resulted in occasional flooding issues. The RCP will be replaced with a 3' X 4' box culvert which will be 45 feet in length. The culvert replacement results in temporary impacts of 195 SF and permanent impacts of 107 SF in wetland 'B' (upstream) and 337 SF of temporary impacts and 246 SF of permanent impacts in wetland 'K' (downstream). The permanent impacts are associated with slope stabilization using riprap/stone. The work is proposed to take place during low flow conditions but Norris Brook is perennial therefore stream bypass will likely be necessary and will be accomplished using a temporary diversion swale and 18" diameter culvert installed within Oak Street Extension. The swale will be stabilized using geotextile fabric and crushed stone. Removal of the existing culvert and replacement with a 3-tall by 4-wide box culvert is considered self-mitigating.

## Concrete Spillway

There is an existing concrete spillway and broad-crested weir on Norris Brook, which impounds the resulting pond. The spillway is in disrepair, and Norris Brook is bypassing the structure due to erosion at the southwest end. The project is proposing measures to repair the structure and restore function as well as to provide a fish ramp to encourage the passage of American eels (*Anguilla rostrata*), which the Natural Heritage Bureau has identified in their report for this location. (The structure currently has a vertical face, which is unfriendly to eels.) The proposed work results in 1,012 SF of temporary impact and 125 SF of permanent impact to wetland 'K'. (When quantifying impacts while completing the application, we have attributed half of the temporary impact to the pond and half to palustrine scrub-shrub (PSS) wetlands along the perimeter of the pond.)

The project proposes to pump down the pond prior to commencing work in this area. Additionally, since Norris Brook is perennial, accommodations for temporary bypass of Norris Brook will likely be needed depending upon how long the work will take and seasonal conditions existing at the time the work is performed. The work will be undertaken during low flow conditions and customary measures will be employed to protect water quality during stream bypass, which will involve pumps and hoses. Those measures will include protection of the hose inlet to minimize the potential to pass pond sediments and protection of the hose outlet to minimize turbidity and scouring as well as associated sedimentation of downstream wetlands and surface waters.

The following represents a general sequence of construction for the project as per Env-Wt 311.06(d). Refer to the site plans for additional details.

- Conduct a pre-construction meeting on site with the NHDES Wetlands Bureau staff, the project engineer, the contractor and any environmental monitor (minimally) to review the wetland permit and other construction documents.
- Notify NHDES and the Town of Exeter no more than 7 days but no less than 72 hours prior to commencing construction.
- Install perimeter siltation controls as per the site plans.
- Remove and replace the existing culverts beneath Oak Street Extension.
- Remediate contaminated areas. (Access will be provided by Oak Street Extension. This will result in permanent impact to several man-made isolated wetland areas.)
- Stabilize remediated areas as necessary with temporary vegetation.
- Commence construction of stormwater management facilities and stabilize same for use during construction of the new access road.
- Commence construction of the new access road. (Install additional perimeter siltation controls as needed. Due to the availability of Oak Street Extension, temporary impacts to Norris Brook to gain access for construction of the 24' box culvert will not be necessary. Excavation for footings etc will take place from uplands (or wetlands approved for impact) on each side of the crossing.)
- Stabilize exposed soils. Areas with exposed that can be final graded and are unlikely to be altered again will be identified quickly and stabilized with vegetation (or by other means as appropriate and/or as identified on the site plans) **incrementally** during construction. Areas of exposed soils will **not** be 'stockpiled' or saved up to be stabilized at the end of the project (for example, by hydroseeding).
- Restore the wildlife bench as needed below the box culvert.
- Implement agreed upon local mitigation measures.

## Invasive species

The site is infested with numerous areas of Japanese knotweed (*Polygonum cuspidatum*), an invasive species that is easily spread during construction activities. Some of these infestations will be impacted by work in wetlands and uplands. The infestations of knotweed (as of 2018) were delineated and subsequently surveyed and are depicted on the attached plan. Where construction work will involve areas that contain knotweed, the project is committed to undertaking work using best management practices identified in the 2008 NH Department of Transportation – *Best Management Practices for Roadside Invasive Plants* and the 2010 *Methods for Disposing of Non-native Invasive Plants* – UNH Cooperative Extension. The environmental monitor will review areas proposed for construction prior

to alteration to ascertain if new infestations exist or if existing infestations have expanded since 2018. Refer to the Limited Invasive Species plan prepared by TF Moran, Inc., dated August 9, 2018.

Whereas portions of the project site are considered a priority resource area (PRA) due to potential rare or threatened species or habitat, the project team continues to coordinate with the New Hampshire Fish and Game Department (NHF&G) to make the requested changes identified below which are reflected on the site plans.

- The project has agreed to utilize wildlife friendly erosion control blankets (jute matting or North American Green SC150BN or equivalent) where blankets are needed for establishing vegetation and stabilization of slopes or other exposed soils. No blankets or matting made with plastic netting or 'biodegradable' plastic netting will be used.
- The project will be utilizing compost filter socks (Filtrexx or equal) for perimeter siltation control.
- The project will instruct construction personnel regarding the potential to encounter Blanding's, spotted or wood turtles and to contact Melissa Doperalski at 271-1738 or Josh Megyesy at 271-1125 for further instructions if turtles are found laying eggs in the work area.
- The following statement has been added to the site plans: All observations of northern black racer snakes encountered from the end of September through the month of April must be immediately reported to the NHFG Department (Brendan Clifford 603-271-0463 or Melissa Doperalski 603-271-1738).
- Stand pipes are a minimum of 8 inches above the bottom of stormwater treatment / gravel wetlands and the openings will be screened to discourage wildlife from entering.
- The project utilizes sloped granite curbing to better accommodate turtles and other wildlife. (The town of Exeter would not approve the use of Cape Cod berm in lieu of vertical granite curbing, nor would they waive the requirement for deep sump catch basins, both of which are friendlier to turtles.)

Refer to Datacheck result 20-3776 from the Natural Heritage Bureau, a copy of which is attached to the application package. We are submitting project plans to the NHB and NHF&G for additional review. NHF&G has already conducted significant review of the subdivision plans for the Alteration of Terrain permit application but they have not had an opportunity to review the Ross Engineering, LLC plans as yet.

A number of conservation / mitigation measures were agreed upon during the local subdivision approval process. The applicant is deeding 6.3± acres of mature forest at the west end of the property to the town. The forest is bisected by Norris Brook and an intermittent stream as well as numerous trails. This land directly abuts and is therefore contiguous to the Henderson-Swasey Town Forest. The applicant has agreed to construct a new trail within this open space. (The trail will involve the crossing of an intermittent stream. It was determined during a previous site walk with the Natural Resource Planner that the stream could be completely spanned bank-to-bank with a foot bridge so this application does not request any impact for crossing of the intermittent stream.) Another 6.3± acres of common open space exists around the project, for a total of 12.6± acres of common open space. There is also significant recreational land available at the east end of the project on Lots 8 and 9. This is not officially open space but is subject to the rights of the homeowners association for passive recreational use and construction / maintenance of the trails and is contiguous to the open space discussed above.

Snow storage areas have been designed so that snow melt is captured by the stormwater management system. Additionally, to further protect water quality, the Homeowners Association documents specifically prohibit the use of conventional fertilizers within the Exeter Natural Resource Protection Districts (Wetland Conservation District and Shoreland Protection District).

The following measures will be undertaken within various open space or other recreation areas under the auspices of the Natural Resource Planner:

- Rehabilitation of the concrete weir /outlet structure that impounds Norris Brook, including the addition of a fish ramp to expedite the potential migration of American Eel as per condition 5 of the EPB approval.
- Aeration will be added to the pond identified as impact area 'F' as per condition 27 of the EPB approval. (The pond has a significant growth of duckweed (*Spirodela* sp.) and algae.
- Installation of nest boxes in several of the open spaces as per condition 28. Brush piles will be constructed to provide wildlife habitat within open space at the east and west ends of the project.
- The limits of cutting / disturbance will be flagged prior to construction and these flags shall be maintained throughout construction as per condition 14 in the EPB approval. (Additionally, due to the time that has lapsed during permitting etc., we are proposing to refresh wet flags along wetland-upland boundaries within proposed work areas prior to commencing construction within wetlands jurisdiction.)
- An environmental monitor, experienced in erosion and sediment control, will be provided for the duration of construction, until the site is suitably stabilized, as per condition 17 of the EPB approval.

Please note the application package has been prepared and printed in a manner that attempts to minimize the use of blank pages or similar to separate exhibits or attachments. This was done in the interest of the environment and minimizing the use of paper as well as for storage / filing considerations. A table of contents has been provided to assist with organization and review.

Upon your review of these materials please feel free to contact me directly with any questions.

Sincerely,

Marc Jacobs, CWS, CSS, CPESC

cc: Mr. Todd Baker  
Mr. Keith Pattison  
Mr. Dave Sharples, Planner, Town of Exeter  
Ms. Kristen Murphy, Natural Resources Planner, Town of Exeter



Exeter Rose Farm, LLC  
953 Islington Street #23D  
Portsmouth NH 03801

Primary Bank  
207 Route 101  
Bedford NH 03110

1317

54-210/114

9/21/2021

Pay to the Order of Treasurer State of New Hampshire

Memo: Wetland Permit App Fee

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Two Thousand Seven Hundred Fifty and 40/100\*\*\*\*\*  
\*\*\*\*\* Dollars

\*\*\*2,750.40\*

Treasurer State of New Hampshire  
29 Hazen Drive  
PO Box 95  
Concord, NH 03302-0095



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**STANDARD DREDGE AND FILL  
WETLANDS PERMIT APPLICATION**  
Water Division/Land Resources Management  
Wetlands Bureau  
[Check the Status of your Application](#)



**RSA/Rule:** RSA 482-A/Env-Wt 100-900

**APPLICANT'S NAME:** Exeter Rose Farm, LLC & Dagostino Revocable Trust      **TOWN NAME:** Exeter

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

A person may request a waiver of the requirements in Rules Env-Wt 100-900 to accommodate situations where strict adherence to the requirements would not be in the best interest of the public or the environment but is still in compliance with RSA 482-A. A person may also request a waiver of the standards for existing dwellings over water pursuant to RSA 482-A:26, III(b). For more information, please consult the [Waiver Request Form](#).

<b>SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2))</b>	
Please use the <a href="#">Wetland Permit Planning Tool (WPPT)</a> , the Natural Heritage Bureau (NHB) <a href="#">DataCheck Tool</a> , the <a href="#">Aquatic Restoration Mapper</a> , or other sources to assist in identifying key features such as: <a href="#">priority resource areas (PRAs)</a> , <a href="#">protected species or habitats</a> , coastal areas, designated rivers, or designated prime wetlands.	
Has the required planning been completed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Does the property contain a PRA? If yes, provide the following information:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> <li>Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHF&amp;G) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04.</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> <li>Protected species or habitat?                             <ul style="list-style-type: none"> <li>If yes, species or habitat name(s): S.F. manna grass, A. Eel, Wood turtle, N.B. Racer snake</li> <li>NHB Project ID #: 20-3776</li> </ul> </li> </ul>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> <li>Bog?</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> <li>Floodplain wetland contiguous to a tier 3 or higher watercourse?</li> </ul>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> <li>Designated prime wetland or duly-established 100-foot buffer?</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> <li>Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone?</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is the property within a Designated River corridor? If yes, provide the following information:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> <li>Name of Local River Management Advisory Committee (LAC): Exeter-Squamscott</li> <li>A copy of the application was sent to the LAC on Month: 02 Day: 23 Year: 2021</li> </ul>	

[irm@des.nh.gov](mailto: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](http://www.des.nh.gov)

For dredging projects, is the subject property contaminated? • If yes, list contaminant:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
For stream crossing projects, provide watershed size (see <u>WPPT</u> or Stream Stats): three crossings - 89, 442 & 544 acres respectively	
<b>SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))</b>	
Provide a <b>brief</b> description of the project and the purpose of the project, outlining the scope of work to be performed and whether impacts are temporary or permanent. DO NOT reply "See attached"; please use the space provided below.	
<p>The project involves a proposed 41-lot residential subdivision of four combined properties, totaling approximately 50 acres, portions of which support existing residential development and portions which formerly supported commercial greenhouses / operations. The project requires construction of a new access road which meets town specifications. The new access road proposes a 24-foot wide open bottom box culvert spanning Norris Brook, a perennial stream. The project also necessitates improvements to an existing road, Oak Street Extension, which involves replacement of three existing culverts, one of which also conveys Norris Brook. The project also involves the repair, rehabilitation and improvement of an existing concrete outlet structure / broad crested weir which impounds Norris Brook. Finally, the project involves upland and wetland areas that are subject to alteration associated with the implementation of a Remedial Action Plan (RAP) due to lead and coal ash contamination resulting from the greenhouse operations. A copy of the RAP is attached.</p>	
<b>SECTION 3 - PROJECT LOCATION</b>	
Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.	
ADDRESS: Oak Street Extension and Forest Street	
TOWN/CITY: Exeter	
TAX MAP/BLOCK/LOT/UNIT: Map 54-Lots 5, 6 & 7, Map 63-Lot 205	
US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME: Norris Brook (tributary to the Squamscott River)	
<input type="checkbox"/> N/A	
(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places):	42.98902° North 70.95520° West

[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

**SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a))**

If the applicant is a trust or a company, then complete with the trust or company information.

NAME: Exeter Rose Farm LLC c/o Todd Baker

MAILING ADDRESS: 24 Oak St. Ext.

TOWN/CITY: Exeter

STATE: NH

ZIP CODE: 03833

EMAIL ADDRESS: todd@bakerprop.com

FAX: NA

PHONE: 603-425-8598

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

**SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c))** N/A

LAST NAME, FIRST NAME, M.I.: Jacobs, Marc E.

COMPANY NAME: Certified Wetland Scientist

MAILING ADDRESS: P.O. Box 417

TOWN/CITY: Greenland

STATE: NH

ZIP CODE: 03840

EMAIL ADDRESS: jacobs2wetsoil2004@yahoo.com

FAX: NA

PHONE: 603-534-SOIL (7645)

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

**SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b))**

If the owner is a trust or a company, then complete with the trust or company information.

 Same as applicant

NAME: Exeter Rose Farm, LLC (see above) &amp; Benjamin &amp; Joan Dagostino Revocable Trust (Lot 205)

MAILING ADDRESS: 1 Forest Street

TOWN/CITY: Exeter

STATE: NH

ZIP CODE: 03833

EMAIL ADDRESS:

FAX:

PHONE:

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

**SECTION 7 - RESOURCE-SPECIFIC CRITERIA ESTABLISHED IN Env-Wt 400, Env-Wt 500, Env-Wt 600, Env-Wt 700, OR Env-Wt 900 HAVE BEEN MET (Env-Wt 313.01(a)(3))**

Describe how the resource-specific criteria have been met for each chapter listed above (please attach information about stream crossings, coastal resources, prime wetlands, or non-tidal wetlands and surface waters):  
 Project impacts a PRA and does not qualify for a PTE under Env-Wt 407.04 and is therefore classified as a major project regardless of impact size (SF). Project provides stormwater tx per NH Alteration of Terrain and does not use wetlands or surface waters for stormwater tx as per Env-Wt 524.04(b). Except as otherwise permitted, the project meets stringent local setbacks and water quality protection measures inc. customary erosion/sediment controls to protect private /public drinking water supplies/source water protection areas/fisheries per Env-Wt-524.04(c). The new project crossing maintains hydrologic connection/flows by spanning Norris Brook. Two proposed culvert replacements restore/maintain hydrologic connections/flows as necessary to preserve adjacent wetland/riparian functions as per Env-Wt 524.04(d). Proposed crossings and prop. rehabilitation of the pond outlet structure maintain/improve existing fishery passage as per Env-Wt 524.04(e). Proposed wetland crossings maintain/improve existing wetland-dependent wildlife habitat and associated migratory pathways per Env-Wt 524.04(f). The project has communicated with NHF&G and their input has been incorporated into the project design. Refer to the attached correspondence. The project does not propose direct impacts to tidal wetlands so Env-Wt 600 does not apply. (The project proposes permanent impact (1,107 SF) to the tip of the 100-year flood plain adjacent to Norris Brook. The flood plain along Norris Brook extends from the Squamscott River, which is approx. 1,300' down stream and is tidally influenced.) The project does not impact prime wetlands so Env-Wt 700 does not apply.

**SECTION 8 - AVOIDANCE AND MINIMIZATION**

Impacts within wetland jurisdiction must be avoided to the maximum extent practicable (Env-Wt 313.03(a)).\* Any project with unavoidable jurisdictional impacts must then be minimized as described in the [Wetlands Best Management Practice Techniques For Avoidance and Minimization](#) and the [Wetlands Permitting: Avoidance, Minimization and Mitigation Fact Sheet](#). For minor or major projects, a functional assessment of all wetlands on the project site is required (Env-Wt 311.03(b)(10)).\*

Please refer to the application checklist to ensure you have attached all documents related to avoidance and minimization, as well as functional assessment (where applicable). Use the [Avoidance and Minimization Checklist](#), the [Avoidance and Minimization Narrative](#), or your own avoidance and minimization narrative.

\*See Env-Wt 311.03(b)(6) and Env-Wt 311.03(b)(10) for shoreline structure exemptions.

**SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)**

If unavoidable jurisdictional impacts require mitigation, a mitigation [pre-application meeting](#) must occur at least 30 days but not more than 90 days prior to submitting this Standard Dredge and Fill Permit Application.

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

( N/A - Mitigation is not required)

**SECTION 10 - THE PROJECT MEETS COMPENSATORY MITIGATION REQUIREMENTS (Env-Wt 313.01(a)(1)c)**

Confirm that you have submitted a compensatory mitigation proposal that meets the requirements of Env-Wt 800 for all permanent unavoidable impacts that will remain after avoidance and minimization techniques have been exercised to the maximum extent practicable:  I confirm submittal.

( N/A – Compensatory mitigation is not required)

**SECTION 11 - IMPACT AREA (Env-Wt 311.04(g))**

For each jurisdictional area that will be/has been impacted, provide square feet (SF) and, if applicable, linear feet (LF) of impact, and note whether the impact is after-the-fact (ATF; i.e., work was started or completed without a permit).

For intermittent and ephemeral streams, the linear footage of impact is measured along the thread of the channel. *Please note, installation of a stream crossing in an ephemeral stream may be undertaken without a permit per Rule Env-Wt 309.02(d), however other dredge or fill impacts should be included below.*

For perennial streams/ivers, the linear footage of impact is calculated by summing the lengths of disturbances to the channel and banks.

Permanent impacts are impacts that will remain after the project is complete (e.g., changes in grade or surface materials).

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

JURISDICTIONAL AREA		PERMANENT			TEMPORARY		
		SF	LF	ATF	SF	LF	ATF
Wetlands	Forested Wetland	891		<input type="checkbox"/>	1748		<input type="checkbox"/>
	Scrub-shrub Wetland	2224		<input type="checkbox"/>	313		<input type="checkbox"/>
	Emergent Wetland	0		<input type="checkbox"/>	0		<input type="checkbox"/>
	Wet Meadow	0		<input type="checkbox"/>	857		<input type="checkbox"/>
	Vernal Pool	0		<input type="checkbox"/>	0		<input type="checkbox"/>
	Designated Prime Wetland	0		<input type="checkbox"/>	0		<input type="checkbox"/>
	Duly-established 100-foot Prime Wetland Buffer	0		<input type="checkbox"/>	0		<input type="checkbox"/>
Surface Water	Intermittent / Ephemeral Stream	0	155	<input type="checkbox"/>	0	67	<input type="checkbox"/>
	Perennial Stream or River	0	0	<input type="checkbox"/>	0	82	<input type="checkbox"/>
	Lake / Pond	0	0	<input type="checkbox"/>	843	0	<input type="checkbox"/>
	Docking - Lake / Pond	0	0	<input type="checkbox"/>	0	0	<input type="checkbox"/>
	Docking - River	0	0	<input type="checkbox"/>	0	0	<input type="checkbox"/>
Banks	Bank - Intermittent Stream	0	155	<input type="checkbox"/>	0	67	<input type="checkbox"/>
	Bank - Perennial Stream / River	0	0	<input type="checkbox"/>	0	246	<input type="checkbox"/>
	Bank / Shoreline - Lake / Pond	0	25	<input type="checkbox"/>	0	23	<input type="checkbox"/>
Tidal	Tidal Waters	0	0	<input type="checkbox"/>	0	0	<input type="checkbox"/>
	Tidal Marsh	0	0	<input type="checkbox"/>	0	0	<input type="checkbox"/>
	Sand Dune	0		<input type="checkbox"/>	0		<input type="checkbox"/>
	Undeveloped Tidal Buffer Zone (TBZ)	0		<input type="checkbox"/>	0		<input type="checkbox"/>
	Previously-developed TBZ	0		<input type="checkbox"/>	0		<input type="checkbox"/>
	Docking - Tidal Water	0		<input type="checkbox"/>	0		<input type="checkbox"/>
<b>TOTAL</b>		<b>3115</b>	<b>335</b>		<b>3761</b>	<b>485</b>	

**SECTION 12 - APPLICATION FEE (RSA 482-A:3, I)**

**MINIMUM IMPACT FEE:** Flat fee of \$400.

**NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION:** Flat fee of \$400 (refer to RSA 482-A:3, 1(c) for restrictions).

**MINOR OR MAJOR IMPACT FEE:** Calculate using the table below:

Permanent and temporary (non-docking):	6876 SF	× \$0.40 =	\$ 2750.40
Seasonal docking structure:	0 SF	× \$2.00 =	\$ 0
Permanent docking structure:	0 SF	× \$4.00 =	\$ 0
Projects proposing shoreline structures (including docks) add \$400 =			\$
Total =			\$ 2750.40

[irm@des.nh.gov](mailto: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](http://www.des.nh.gov)

<p><b>The application fee for minor or major impact is the above calculated total or \$400, whichever is greater = \$</b></p>		
<p><b>SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)</b>                  Indicate the project classification.</p>		
<input type="checkbox"/> Minimum Impact Project	<input type="checkbox"/> Minor Project	<input checked="" type="checkbox"/> Major Project
<p><b>SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)</b></p>		
<p><b>Initial each box below to certify:</b></p>		
Initials: TB BD MJ	To the best of the signer's knowledge and belief, all required notifications have been provided.	
Initials: TB BD MJ	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.	
Initials: TB BD MJ	The signer understands that: <ul style="list-style-type: none"> <li>• The submission of false, incomplete, or misleading information constitutes grounds for NHDES to:                         <ol style="list-style-type: none"> <li>1. Deny the application.</li> <li>2. Revoke any approval that is granted based on the information.</li> <li>3. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1.</li> </ol> </li> <li>• The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.</li> <li>• The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.</li> </ul>	
Initials: TB BD MJ	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.	
<p><b>SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)</b></p>		
SIGNATURE (OWNER): _____	PRINT NAME LEGIBLY: Ben Dagostino	DATE:
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER): _____	PRINT NAME LEGIBLY: Todd Baker (owner and applicant)	DATE:
SIGNATURE (AGENT, IF APPLICABLE): _____	PRINT NAME LEGIBLY: Marc E. Jacobs	DATE:
<p><b>SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))</b></p>		
As required by RSA 482-A:3, I(a)(1), 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.		
TOWN/CITY CLERK SIGNATURE: _____	PRINT NAME LEGIBLY:	



TOWN/CITY:	DATE:
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**DIRECTIONS FOR TOWN/CITY CLERK:**

Per RSA 482-A:3, I(a)(1)

1. IMMEDIATELY sign the original application form and four copies in the signature space provided above.
2. 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.
3. 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.
4. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

**DIRECTIONS FOR APPLICANT:**

Submit the 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 at the address at the bottom of this page. Make check or money order payable to "Treasurer – State of NH".

[irm@des.nh.gov](mailto: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](http://www.des.nh.gov)

**SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)**  
 Indicate the project classification.

Minimum Impact Project     
  Minor Project     
  Major Project

**SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)**

Initial each box below to certify:

Initials: <input type="checkbox"/> TB <input type="checkbox"/> BD <input type="checkbox"/> MJ	To the best of the signer's knowledge and belief, all required notifications have been provided.
--	--

Initials: <input type="checkbox"/> TB <input type="checkbox"/> BD <input type="checkbox"/> MJ	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.
--	--

Initials: <input type="checkbox"/> TB <input type="checkbox"/> BD <input type="checkbox"/> MJ	The signer understands that: <ul style="list-style-type: none"> <li>• The submission of false, incomplete, or misleading information constitutes grounds for NHDES to:                         <ol style="list-style-type: none"> <li>1. Deny the application.</li> <li>2. Revoke any approval that is granted based on the information.</li> <li>3. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1.</li> </ol> </li> <li>• The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.</li> <li>• The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.</li> </ul>
--	--

Initials: <input type="checkbox"/> TB <input type="checkbox"/> BD <input type="checkbox"/> MJ	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.
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**SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)**

SIGNATURE (OWNER): 	PRINT NAME LEGIBLY: Ben Dagostino	DATE: 
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER): 	PRINT NAME LEGIBLY: Todd Baker (owner and applicant)	DATE: 9-1-2021
SIGNATURE (AGENT, IF APPLICABLE): 	PRINT NAME LEGIBLY: Marc E. Jacobs	DATE: 09/22/2021

**SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))**

As required by RSA 482-A:3, I(a)(1), 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.

TOWN/CITY CLERK SIGNATURE: 	PRINT NAME LEGIBLY: 
TOWN/CITY:	DATE:

**SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)**

Indicate the project classification.

Minimum Impact Project

Minor Project

Major Project

**SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)**

Initial each box below to certify:

Initials:

TB

BD LDD

MJ

To the best of the signer's knowledge and belief, all required notifications have been provided.

Initials:

TB

BD LDD

MJ

The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.

The signer understands that:

- The submission of false, incomplete, or misleading information constitutes grounds for NHDES to:
  1. Deny the application.
  2. Revoke any approval that is granted based on the information.
  3. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1.
- The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.
- The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.

Initials:

TB

BD LDD

MJ

Initials:

TB

BD LDD

MJ

If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.

**SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)**

SIGNATURE (OWNER): <i>Benjamin J. Dagostino, Jr. &amp; Lyn D. Drake, Trustees</i>	PRINT NAME LEGIBLY: Benjamin J. Dagostino, Jr. & Lyn D. Drake, Trustees The Joan Dagostino Revocable Trust (owner) and The Benjamin J. Dagostino, Sr. Revocable Trust (owner)	DATE: 9/1/11
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER): _____	PRINT NAME LEGIBLY: Todd Baker (owner and applicant)	DATE:
SIGNATURE (AGENT, IF APPLICABLE): _____	PRINT NAME LEGIBLY: Marc E. Jacobs	DATE:

**SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))**

As required by RSA 482-A:3, I(a)(1), 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.

TOWN/CITY CLERK SIGNATURE: _____	PRINT NAME LEGIBLY:
TOWN/CITY:	DATE:





STANDARD DREDGE AND FILL  
WETLANDS PERMIT APPLICATION  
ATTACHMENT A: MINOR AND MAJOR PROJECTS



Water Division/Land Resources Management  
Wetlands Bureau

[Check the Status of your Application](#)

**RSA/ Rule:** RSA 482-A/ Env-Wt 311.10; Env-Wt 313.01(a)(1); Env-Wt 313.03

**APPLICANT'S NAME:** Exeter Rose Farm, LLC      **TOWN NAME:** Exeter

Attachment A is required for *all minor and major projects*, and must be completed *in addition* to the [Avoidance and Minimization Narrative](#) or [Checklist](#) that is required by Env-Wt 307.11.

For projects involving construction or modification of non-tidal shoreline structures over areas of surface waters having an absence of wetland vegetation, only Sections I.X through I.XV are required to be completed.

**PART I: AVOIDANCE AND MINIMIZATION**

In accordance with Env-Wt 313.03(a), the Department shall not approve any alteration of any jurisdictional area unless the applicant demonstrates that the potential impacts to jurisdictional areas have been avoided to the maximum extent practicable and that any unavoidable impacts have been minimized, as described in the [Wetlands Best Management Practice Techniques For Avoidance and Minimization](#).

**SECTION I.I - ALTERNATIVES (Env-Wt 313.03(b)(1))**

Describe how there is no practicable alternative that would have a less adverse impact on the area and environments under the Department's jurisdiction.

OAK ST EXT ESSENTIALLY CONSTITUTES A DRIVEWAY, WHICH CANNOT BE IMPROVED TO MEET CURRENT DESIGN STANDARDS AND WHICH LACKS SAFE SIGHT DISTANCE DUE TO EXISTING DEVELOPMENT PROXIMAL TO THE ROAD, ORIGINAL CONSTRUCTION OF WHICH SIGNIFICANTLY PREDATES CURRENT REGULATIONS, THEREFORE A NEW ROAD MUST BE CONSTRUCTED TO GAIN ACCESS TO THE SITE. THE DAGOSTINO PROPERTY WAS THEREFORE PURCHASED. NORRIS BROOK BISECTS THE BULK OF THE AVAILABLE UPLAND FROM FOREST ST SO THERE IS NO ACCESS W/O A STREAM CROSSING. TOPOGRAPHY ADJACENT TO NORRIS BROOK IS DRAMATIC AND LIMITS SUITABLE CROSSING LOCATIONS. THE NEW PROPOSED CROSSING SPANS NORRIS BROOK USING A LARGE OPEN BOTTOM BOX CULVERT, THUS MINIMIZING SIDE SLOPE GRADING, BUT IMPACTS TO WETLANDS ADJACENT TO THE BROOK WITHIN THE ROAD ALIGNMENT ARE UNAVOIDABLE W/O A BRIDGE. EARLY ROAD LAYOUTS INVOLVED CROSSING NORRIS BROOK FURTHER DOWNSTREAM, RESULTING IN CONSIDERABLY MORE WETLAND IMPACT, ESPECIALLY FLOODPLAIN WETLANDS. ALSO, EARLY PROJECT DESIGNS INVOLVED SIGNIFICANTLY MORE ROAD LENGTH & ASSOCIATED IMPERVIOUS SURFACE AS WELL AS TWO ADDITIONAL STREAM CROSSINGS TO ACCESS ADDITIONAL BUILDABLE AREA. THE PLANNING BOARD YIELD PLAN AND DESIGN REVIEW PROCESS, WITH ABUTTER INPUT OVER A LENGTHY PERIOD OF TIME, RESULTED IN THE CURRENT DESIGN. WHEREAS OAK ST EXT WILL CONNECT TO THE NEW SUBDIVISION ROAD AND PROVIDE DRIVEWAY ACCESS TO NEW DWELLING UNITS, PLANNING BOARD APPROVAL REQUIRES REPLACEMENT OF EXISTING CULVERTS BENEATH OAK STREET EXT. (OAK ST EXT WILL CONTINUE TO PROVIDE VEHICLE ACCESS TO THE "JAILHOUSE" SPRING, BUT WILL BE GATED TO PROHIBIT ROUTINE VEHICLE THROUGH-TRAFFIC.) SEVERAL ISOLATED MAN-MADE WETLANDS ARE CONTAMINATED WITH LEAD. THEIR LOSS IS UNAVOIDABLE DURING SITE REMEDIATION. ADDITIONALLY, A MAN-MADE POND WILL BE DREDGED DUE TO LEAD CONTAMINATION BUT IS INTENDED TO REMAIN.

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**SECTION I.II - MARSHES (Env-Wt 313.03(b)(2))**

Describe how the project avoids and minimizes impacts to tidal marshes and non-tidal marshes where documented to provide sources of nutrients for finfish, crustacean, shellfish, and wildlife of significant value.

No marshes are proposed to be impacted by the project.

**SECTION I.III - HYDROLOGIC CONNECTION (Env-Wt 313.03(b)(3))**

Describe how the project maintains hydrologic connections between adjacent wetland or stream systems.

The project proposes a 24-foot X 5-foot open bottom box culvert to cross Norris Brook with the new subdivision roadway. The existing 36" diameter reinforced concrete pipe (RCP) on Norris Brook upstream of the proposed new crossing will be replaced with a 3' X 4' box culvert. Two other existing culverts beneath Oak Street Extension will be replaced. Sections of the 24-inch diameter RCP closer to the Jailhouse Spring have separated and the culvert will therefore be replaced as required by the planning board. The culvert which drains the discharge from the spring beneath Oak Street Extension will also be replaced. These actions will either maintain or improve existing hydrologic conditions.

**SECTION I.IV - JURISDICTIONAL IMPACTS (Env-Wt 313.03(b)(4))**

Describe how the project avoids and minimizes impacts to wetlands and other areas of jurisdiction under RSA 482-A, especially those in which there are exemplary natural communities, vernal pools, protected species and habitat, documented fisheries, and habitat and reproduction areas for species of concern, or any combination thereof.

The project avoids and minimizes jurisdictional resources but cannot avoid permanent impact to 1,107 square feet of 100-year floodplain . (The Exeter Natural Resources Inventory (NRI) identifies floodplain forest which comes to the outlet of the existing concrete outlet structure that impounds Norris Brook. The NRI also depicts the flood plain forest extending well into adjacent uplands that are not subject to flooding. This is likely a function of the scale of the mapping. Refer to the Wetland Functional Assessment.) Other resource maps depict the 100-year flood plain differently. We have used elevation 8 to identify the limit of the flood plain. The flood plain depicted is based upon extensive on-the-ground data. The project does not involve any vernal pool habitat. The project has worked closely with the NHF&G to minimize impacts on sensitive turtles. Surveys for potential Black racer snakes have been undertaken. Refer to the ATTACHED reports. The project is proposing to repair the concrete outlet structure that impounds the Norris Brook and add a fish ramp to permit passage of potential American eel. See the ATTACHED correspondence with NHF&G. The project continues to coordinate with the Natural Heritage Bureau regarding sensitive plants.

**SECTION I.V - PUBLIC COMMERCE, NAVIGATION, OR RECREATION (Env-Wt 313.03(b)(5))**

Describe how the project avoids and minimizes impacts that eliminate, depreciate or obstruct public commerce, navigation, or recreation.

Regarding recreation, some unauthorized mountain bike trails on this private property will be rerouted to allow continued use. Navigation is not applicable to this project or setting. Oak Street Extension once provided access to commercial greenhouse operation but now supports residential traffic. Public commerce is no longer applicable to this property.

**SECTION I.VI - FLOODPLAIN WETLANDS (Env-Wt 313.03(b)(6))**

Describe how the project avoids and minimizes impacts to floodplain wetlands that provide flood storage.

The proposed subdivision roadway impacts 1,107 square feet of floodplain wetlands (elevation 8), which generally terminate at the base of the existing concrete outlet structure that impounds Norris Brook and extend a short distance upstream of the confluence with another stream which discharges just below the structure. The project proposes an open bottom box culvert with a 24-foot span to cross Norris Brook in this area. The associated box culvert retaining walls will significantly limit side slope grading and associated impacts to either side of the crossing but wetlands and floodplain directly within the road alignment will be lost. Whereas the flood storage lost is approximately 220 cubic feet, the project is not proposing to replace the lost flood storage. Moving the road upstream would impact the pond/Norris Brook. Moving the proposed road further downstream would impact a greater extent of flood plain and wetlands. Moving the proposed road alignment so that it intercepts Oak Street Extension upstream of the man-made pond on Norris Brook, an alternative discussed and abandoned during the planning board process (and not mentioned in our avoidance and minimization discussions elsewhere), would result in massive grading to achieve the slope required by current road design standards and will also increase direct wetland impacts.

**SECTION I.VII - RIVERINE FORESTED WETLAND SYSTEMS AND SCRUB-SHRUB – MARSH COMPLEXES (Env-Wt 313.03(b)(7))**

Describe how the project avoids and minimizes impacts to natural riverine forested wetland systems and scrub-shrub – marsh complexes of high ecological integrity.

The project minimizes impacts to natural riverine forested wetland systems. The proposed subdivision roadway and box culvert will impact some scrub-shrub wetlands located to either side of Norris Brook immediately below the existing concrete outlet structure. There is a narrow fringe of forested wetlands at the periphery of scrub-shrub wetlands where they transition to uplands. Wet meadow/marsh wetlands can be found further downstream below the proposed crossing (in much of the area denoted by the Exeter NRI as floodplain forest) and these emergent wetlands are not proposed for impact. (Most wetland impacts throughout this projects involve wetlands which have been previously altered to various degrees.)



**SECTION I.VIII - DRINKING WATER SUPPLY AND GROUNDWATER AQUIFER LEVELS (Env-Wt 313.03(b)(8))**

Describe how the project avoids and minimizes impacts to wetlands that would be detrimental to adjacent drinking water supply and groundwater aquifer levels.

The existing residences in the area are served by municipal water. Those homes proposed by the subdivision will be served by municipal water. Existing soil data, generally verified by onsite soil testing for the stormwater management system design, confirm that the property and soils do not embody a groundwater drinking aquifer or support a drinking water supply. The site provides minimal groundwater recharge, but exhibits significant groundwater discharge, which drains to the Norris Brook and the Squamscott River, which is approximately 1,000 feet distant.

**SECTION I.IX - STREAM CHANNELS (Env-Wt 313.03(b)(9))**

Describe how the project avoids and minimizes adverse impacts to stream channels and the ability of such channels to handle runoff of waters.

The 24-foot wide X 5-foot high box culvert which will span the Norris Brook at the proposed subdivision road is open bottom and will provide significantly more than 1.2 times the average bankful width. The box culvert is aligned with the stream channel and maintains hydraulic compatibility and aquatic organism passage. The existing 36-inch diameter reinforced concrete pipe beneath Oak Street Extension, which has settled and is acting to impede the flow of Norris Brook, will be removed and replaced with a 3-foot by 4-foot box culvert. The 24-inch diameter culvert beneath Oak Street Extension, which has also settled and separated, will be removed and replaced with a culvert set at the proper elevation. The two proposed culvert replacements, as requested by the town, are therefore self-mitigating.

**SECTION I.X - SHORELINE STRUCTURES - CONSTRUCTION SURFACE AREA (Env-Wt 313.03(c)(1))**

Describe how the project has been designed to use the minimum construction surface area over surface waters necessary to meet the stated purpose of the structures.

Not applicable

**SECTION I.XI - SHORELINE STRUCTURES - LEAST INTRUSIVE UPON PUBLIC TRUST (Env-Wt 313.03(c)(2))**

Describe how the type of construction proposed is the least intrusive upon the public trust that will ensure safe docking on the frontage.

Not applicable

**SECTION I.XII - SHORELINE STRUCTURES – ABUTTING PROPERTIES (Env-Wt 313.03(c)(3))**

Describe how the structures have been designed to avoid and minimize impacts on ability of abutting owners to use and enjoy their properties.

Not applicable

**SECTION I.XIII - SHORELINE STRUCTURES – COMMERCE AND RECREATION (Env-Wt 313.03(c)(4))**

Describe how the structures have been designed to avoid and minimize impacts to the public's right to navigation, passage, and use of the resource for commerce and recreation.

Not applicable

**SECTION I.XIV - SHORELINE STRUCTURES – WATER QUALITY, AQUATIC VEGETATION, WILDLIFE AND FINFISH HABITAT (Env-Wt 313.03(c)(5))**

Describe how the structures have been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.

Not applicable

**SECTION I.XV - SHORELINE STRUCTURES – VEGETATION REMOVAL, ACCESS POINTS, AND SHORELINE STABILITY (Env-Wt 313.03(c)(6))**

Describe how the structures have been designed to avoid and minimize the removal of vegetation, the number of access points through wetlands or over the bank, and activities that may have an adverse effect on shoreline stability.

Not applicable

**PART II: FUNCTIONAL ASSESSMENT**

**REQUIREMENTS**

Ensure that project meets the requirements of Env-Wt 311.10 regarding functional assessment (Env-Wt 311.04(j); Env-Wt 311.10).

**FUNCTIONAL ASSESSMENT METHOD USED:**

Highway Methodology (except for the Ecological Integrity function which utilized the Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire - 2011)

**NAME OF CERTIFIED WETLAND SCIENTIST (FOR NON-TIDAL PROJECTS) OR QUALIFIED COASTAL PROFESSIONAL (FOR TIDAL PROJECTS) WHO COMPLETED THE ASSESSMENT: MARC JACOBS**

**DATE OF ASSESSMENT: 2018 AND 2021**

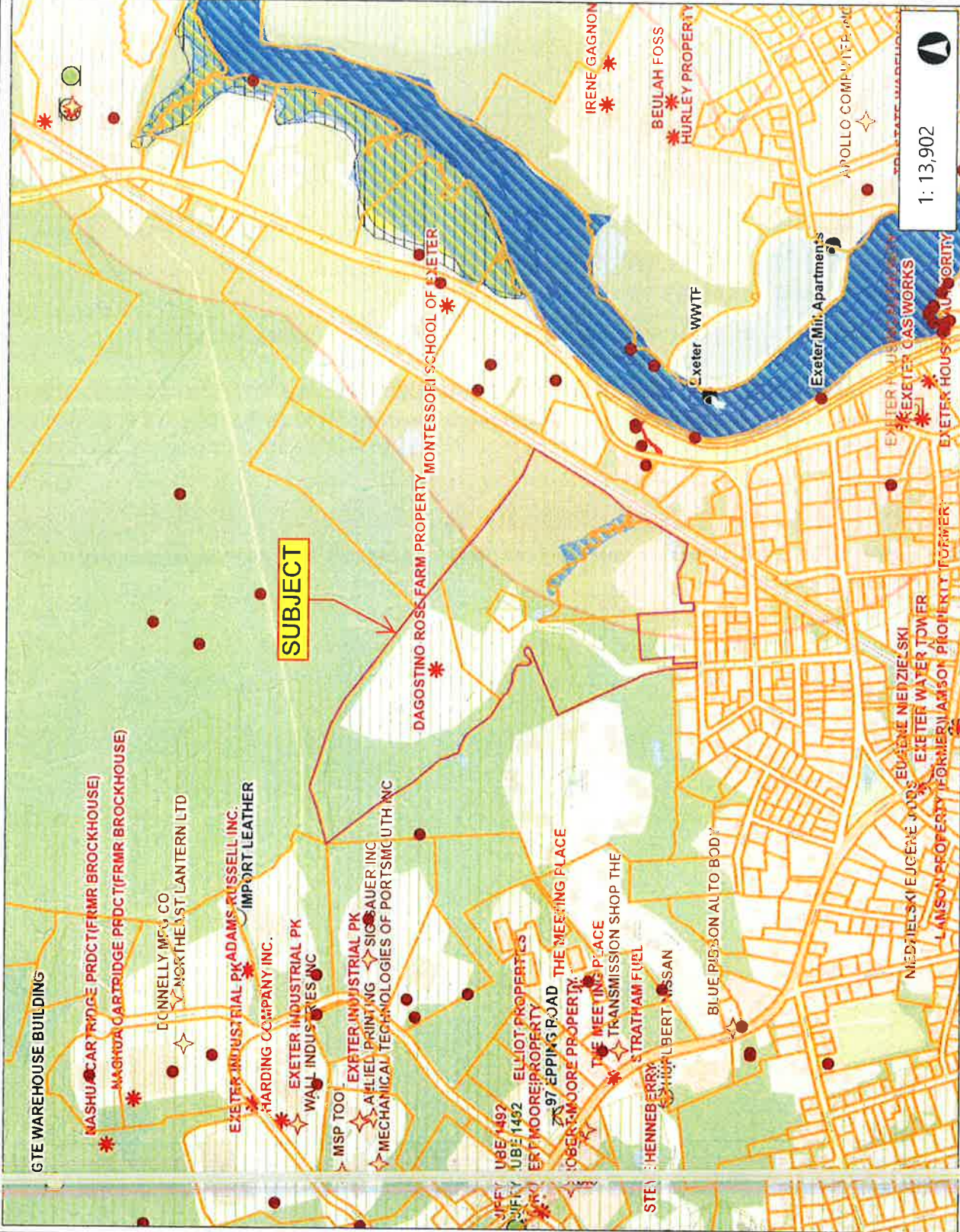
Check this box to confirm that the application includes a NARRATIVE ON FUNCTIONAL ASSESSMENT:



For minor or major projects requiring a standard permit without mitigation, the applicant shall submit a wetland evaluation report that includes completed checklists and information demonstrating the RELATIVE FUNCTIONS AND VALUES OF EACH WETLAND EVALUATED. Check this box to confirm that the application includes this information, if applicable:



Note: The Wetlands Functional Assessment worksheet can be used to compile the information needed to meet functional assessment requirements.



1: 13,902

0.4 Miles



This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

WGS 1984 Web\_Mercator\_Auxiliary\_Sphere  
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*mcg*

THIS MAP IS NOT TO BE USED FOR NAVIGATION

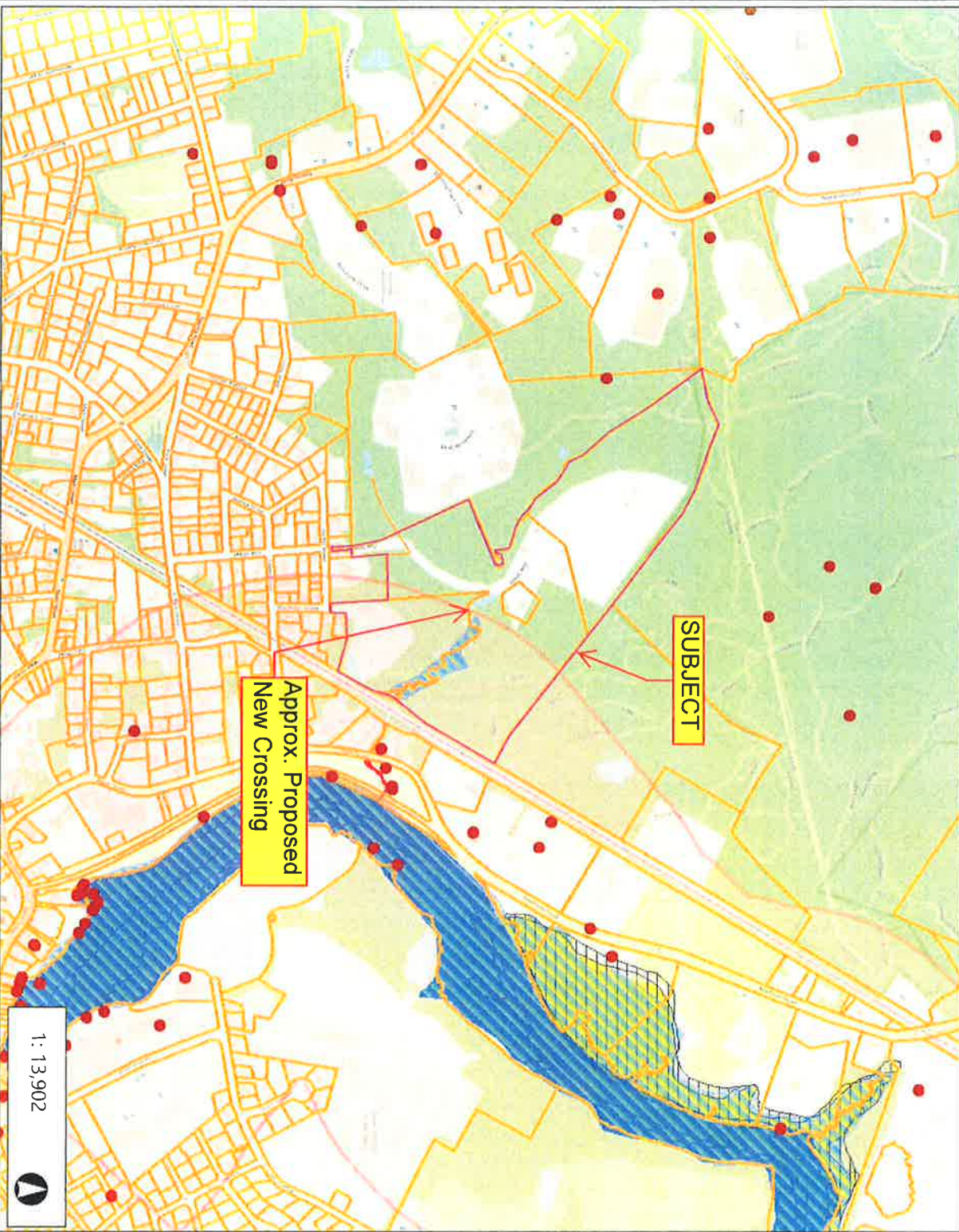
Legend

- Wetland\_Permits\_points
- Parcel Polygons
- Parcel Polygons
- Attributes for Additional Lines
- Parcel Lines
- Aboveground Storage Tank Site
- Asbestos Disposal Sites
- Automobile Salvage Yards
- Hazardous Waste Generators
- NPDES Outfalls
- Outstanding Resource Water
- Remediation Sites
- Solid Waste Facilities
- Underground Storage Tank Site
- Flood Plain Wetlands Adjacent
- Prime Wetlands with 100 ft Buffer
- Prime Wetlands
- Peatlands
- Designated Rivers
- Subject to SWQPA
- Not Subject to SWQPA
- Sand Dunes
- backdune
- foredune
- interdune
- other

Notes

POTENTIALLY CONTAMINATED SITES,  
OUTSTANDING RESOURCE WATERS,  
IMPAIRED WATERS

**ATTACHMENT A2**



1 : 13,902



0.4 0 0.22 0.4 Miles

WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
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*MCG*

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**THIS MAP IS NOT TO BE USED FOR NAVIGATION**

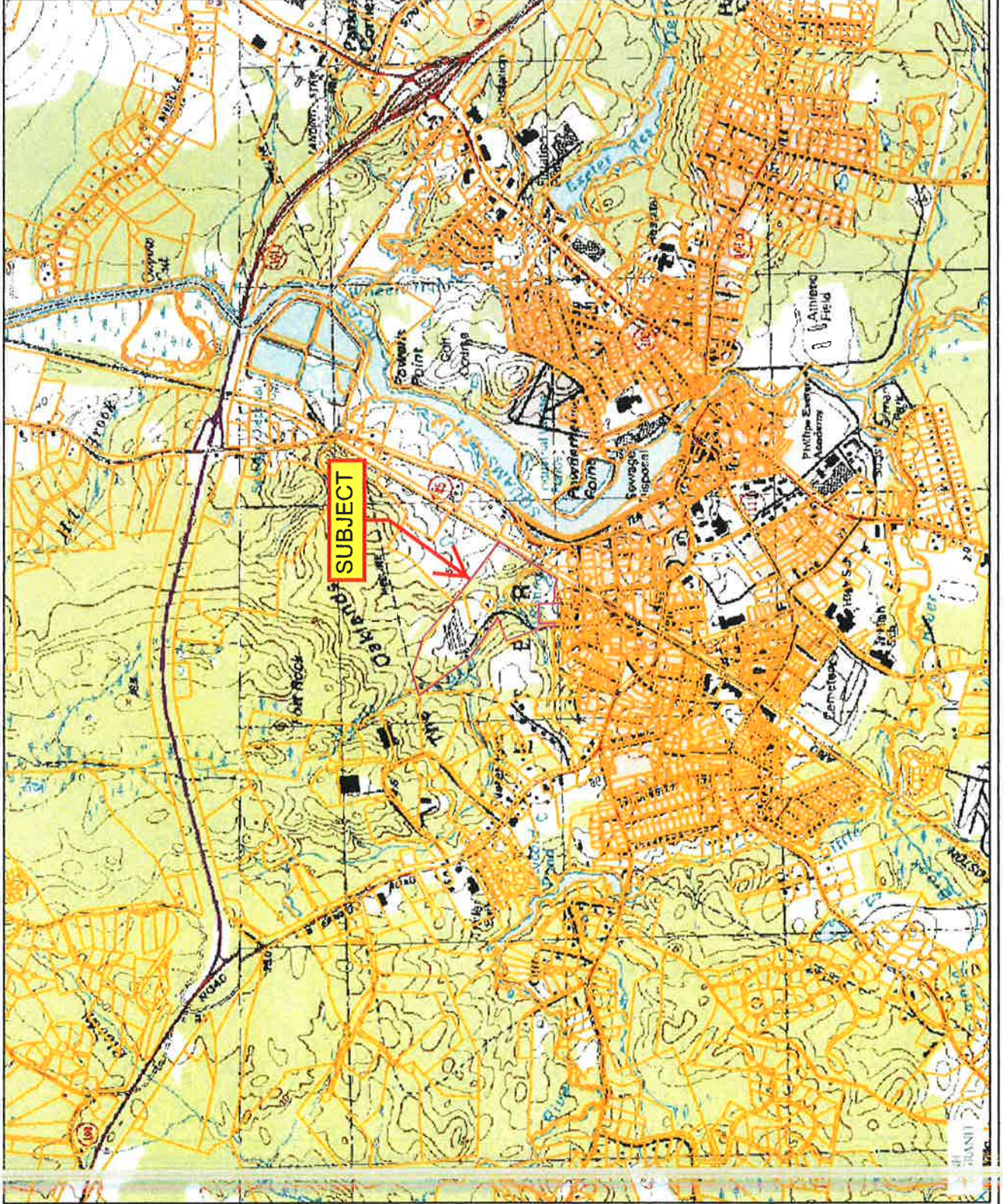
**Legend**

- Wetland\_Permits\_points
- Parcel Polygons
- Parcel Polygons
- Attributes for Additional Lines
- Parcel Lines
- Rivers and Streams
- Rivers and Streams
- Rivers and Streams
- Rivers and Streams
- Rivers and Streams
- Rivers and Streams
- Flood Plain Wetlands Adjacent
- Prime Wetlands with 100 ft Bul
- Prime Wetlands
- Peatlands
- Designated Rivers
- Subject to SWQPA
- Not Subject to SWQPA
- Sand Dunes
- backdune
- foredune
- interdune
- other
- Tidal Waters / Tidal Wetlands
- Tidal wetland
- Transitional salt marsh
- Salt marsh

**Notes**

PRA'S FISHERIES-SPECIES OF CONSERVATION CONCERN, DESIGNATED RIVERS

# EXETER ROSE FARM, LLC



## Legend

- Parcels
- Parcel Polygons
- Attributes for Additional Lines
- State
- County
- City/Town

ATTACHMENT A3



Map Scale  
1: 24,000

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Map Generated: 9/20/2021

## Notes

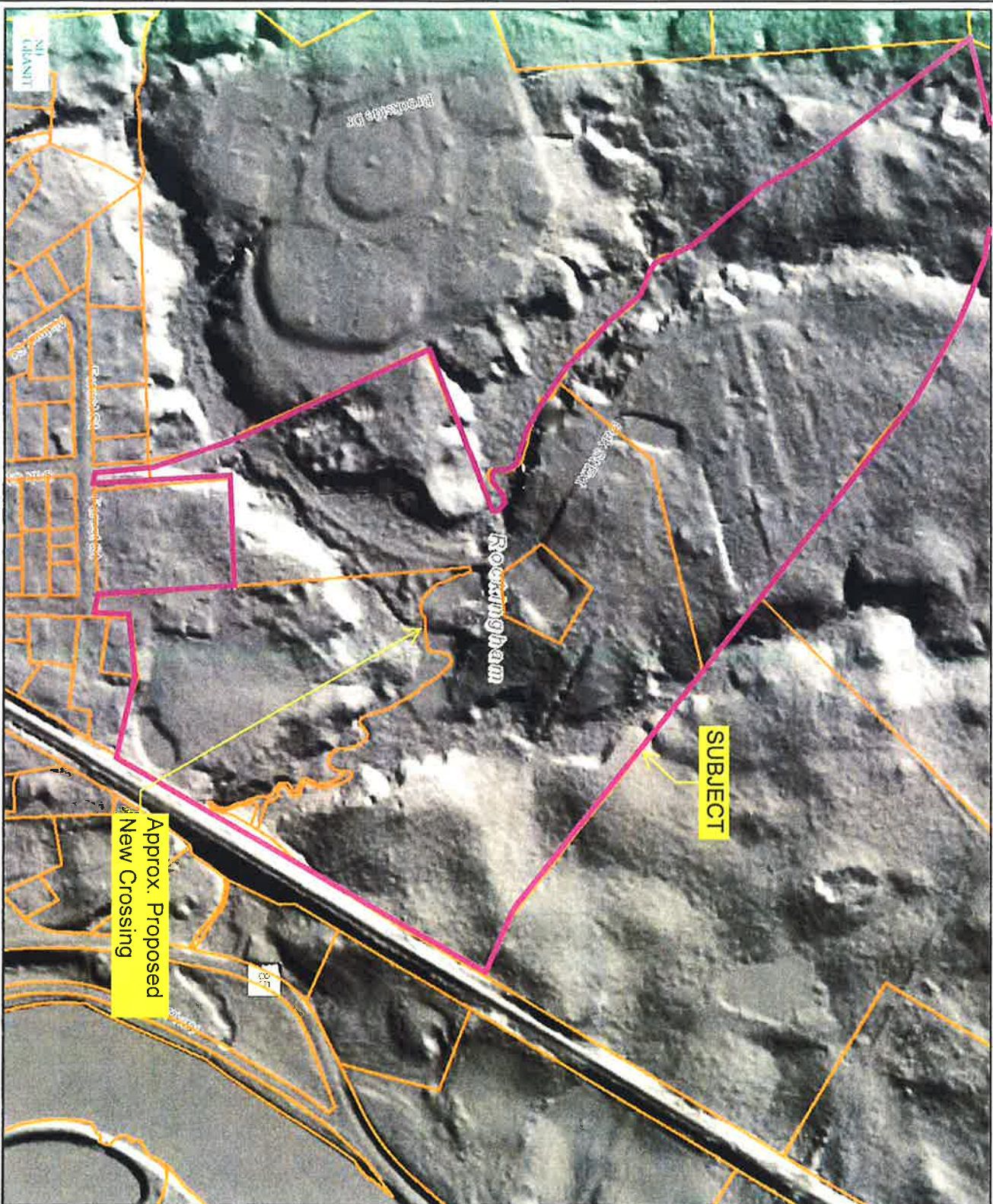
7.5 MINUTE USGS EXETER  
QUADRANGLE

*MEJ*





# EXETER ROSE FARM, LLC



## Legend

- Parcels
- Parcel Polygons
- Attributes for Additional Lines
- State
- County
- City/Town
- LIDAR-Based Bare Earth Hill
- High : 1906
- Low : -1

**ATTACHMENT A4**

Map Scale  
1 : 3,921



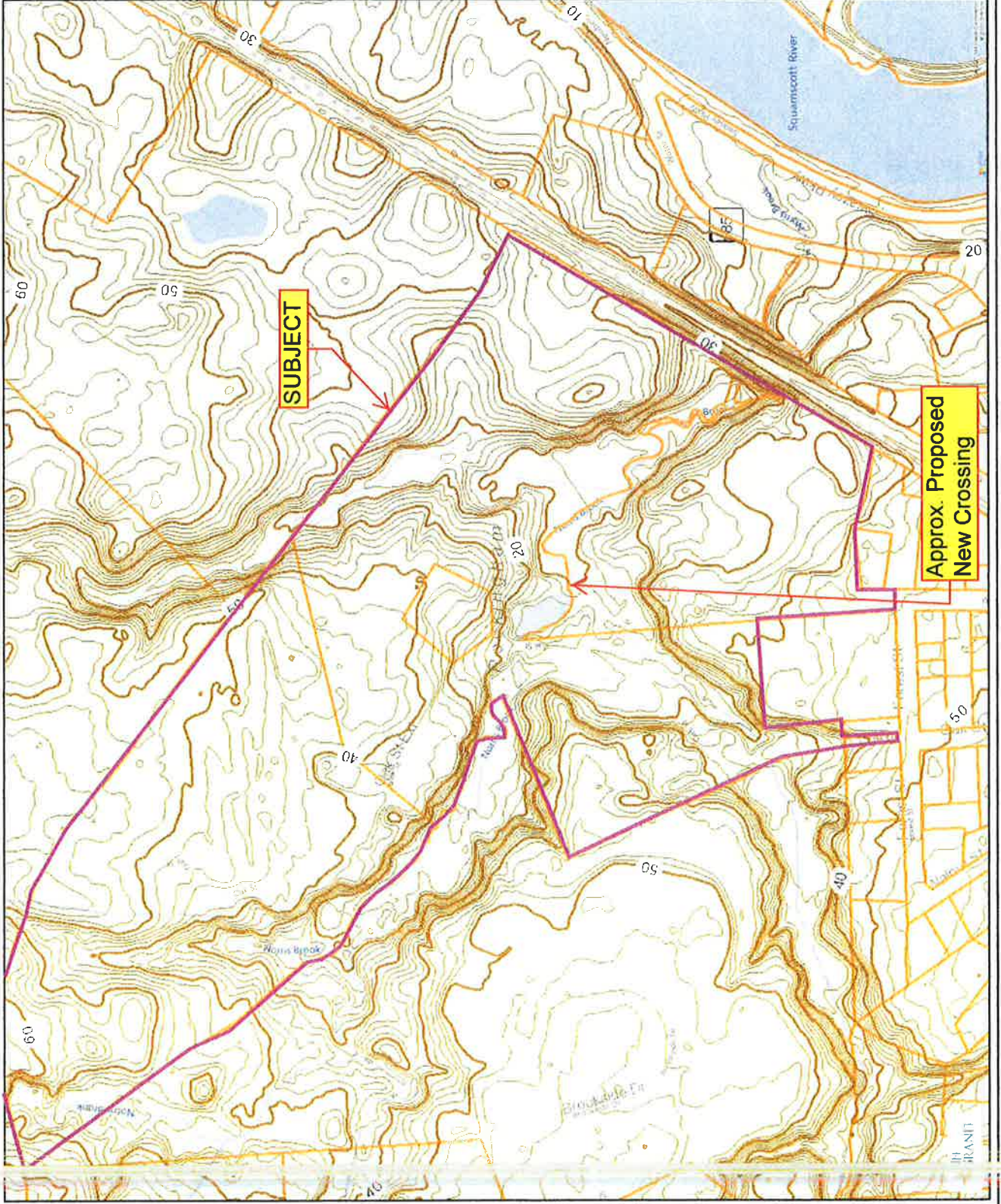
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Map Generated: 9/20/2021

## Notes

LIDAR-BASED BARE EARTH HILLSHADE



EXETER ROSE FARM, LLC



Legend

- Contour\_2ft\_0108020201\_s
- Contour\_2ft\_0108020202\_s
- Contour\_2ft\_0108020201\_s
- Contour\_2ft\_0108020202\_s
- Contour\_2ft\_0108020101\_s
- Contour\_2ft\_0108020102\_s
- Contour\_2ft\_0108020103\_s
- Contour\_2ft\_0108020104\_s
- Contour\_2ft\_0108020105\_s
- Contour\_2ft\_0108020101\_s
- Contour\_2ft\_0108020102\_s
- Contour\_2ft\_0108020103\_s
- Contour\_2ft\_0108020104\_s
- Contour\_2ft\_0108020105\_s
- Contour\_2ft\_0108010702\_s
- Contour\_2ft\_0108010705\_s
- Contour\_2ft\_0108010702\_s
- Contour\_2ft\_0108010705\_s
- Contour\_2ft\_0108010601\_s
- Contour\_2ft\_0108010603\_s
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- Contour\_2ft\_0108010607\_s
- Contour\_2ft\_0108010601\_s
- Contour\_2ft\_0108010603\_s
- Contour\_2ft\_0108010604\_s

Map Scale  
1: 3,921

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Map Generated: 9/20/2021

Notes

LIDAR DERIVED 2-FOOT CONTOURS

ATTACHMENT A5

*MEJ*





AVOIDANCE AND MINIMIZATION  
WRITTEN NARRATIVE  
Water Division/Land Resources Management  
Wetlands Bureau  
[Check the Status of your Application](#)



RSA/ Rule: RSA 482-A/ Env-Wt 311.04(j); Env-Wt 311.07; Env-Wt 313.01(a)(1)b; Env-Wt 313.01(c)

APPLICANT'S NAME: Exeter Rose Farm, LLC

TOWN NAME: Exeter

An applicant for a standard permit shall submit with the permit application a written narrative that explains how all impacts to functions and values of all jurisdictional areas have been avoided and minimized to the maximum extent practicable. This attachment can be used to guide the narrative (attach additional pages if needed). Alternatively, the applicant may attach a completed [Avoidance and Minimization Checklist \(NHDES-W-06-050\)](#) to the permit application.

**SECTION 1 - WATER ACCESS STRUCTURES (Env-Wt 311.07(b)(1))**

Is the primary purpose of the proposed project to construct a water access structure?

No

**SECTION 2 - BUILDABLE LOT (Env-Wt 311.07(b)(1))**

Does the proposed project require access through wetlands to reach a buildable lot or portion thereof?

Yes

**SECTION 3 - AVAILABLE PROPERTY (Env-Wt 311.07(b)(2))\***

For any project that proposes permanent impacts of more than one acre, or that proposes permanent impacts to a PRA, or both, are any other properties reasonably available to the applicant, whether already owned or controlled by the applicant or not, that could be used to achieve the project's purpose without altering the functions and values of any jurisdictional area, in particular wetlands, streams, and PRAs?

*\*Except as provided in any project-specific criteria and except for NH Department of Transportation projects that qualify for a categorical exclusion under the National Environmental Policy Act.*

The applicant is purchasing the Dagostino property to provide access (which meets town standards) to other buildable land in order to subdivide. This access requires construction of the new road, which results in impacts to the Priority Resource Area.

**SECTION 4 - ALTERNATIVES (Env-Wt 311.07(b)(3))**

Could alternative designs or techniques, such as different layouts, different construction sequencing, or alternative technologies be used to avoid impacts to jurisdictional areas or their functions and values as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization?

Oak Street Extension essentially constitutes a driveway, which cannot be improved to meet current design standards and which lacks safe sight distance due to existing development proximal to the road, original construction of which significantly predates current regulations and design/safety standards, therefore a new road must be constructed to gain access to the site. The Dagostino property was therefore purchased to provide suitable access. Norris Brook bisects the bulk of the available upland from Forest Street so there is no access without a stream crossing. Topography adjacent to Norris Brook is dramatic and limits suitable crossing locations. The new proposed crossing spans Norris Brook using a large open bottom box culvert and retaining walls, thus minimizing side slope grading, but impacts to wetlands adjacent to the brook within the road alignment are unavoidable without a bridge. Early road layouts involved crossing Norris Brook further to the east/downstream, resulting in considerably more impact to wetlands, especially floodplain wetlands. Additionally, early project designs involved significantly more road length and associated impervious surface as well as two additional stream crossings to access additional buildable area. The planning board yield plan and design review process, with significant abutter input over a lengthy period of time, resulted in the current design. Whereas Oak St Extension will connect to the new subdivision road and provide driveway access to a handful of new residential dwelling units, the planning board approval requires replacement of existing culverts beneath Oak St Ext. (Oak St Ext will continue to provide vehicle access to the "Jailhouse" spring, but will be gated to prohibit routine vehicle through-traffic.) Several isolated man-made wetlands are contaminated with lead and their loss is unavoidable during site remediation. Additionally, a man-made pond will be dredged due to lead contamination but is intended to remain after site remediation efforts are complete.

**SECTION 5 - CONFORMANCE WITH Env-Wt 311.10(c) (Env-Wt 311.07(b)(4))\*\***

How does the project conform to Env-Wt 311.10(c)?

*\*\*Except for projects solely limited to construction or modification of non-tidal shoreline structures only need to complete relevant sections of Attachment A.*

The project has used the wetland functional assessment, as influenced by the local design review process and adjacent topography, to select the stream crossing location which results in the least environmental impact to areas under the department's jurisdiction. The proposed open bottom box culvert minimizes impacts and is the suitable choice for this location. The proposed replacement of existing culverts will generally improve hydraulic characteristics elsewhere. Remediation of the man-made wetlands which are contaminated with lead cannot be overlooked and their loss is unavoidable.



RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT PROJECT-SPECIFIC WORKSHEET FOR STANDARD APPLICATION



Water Division/Land Resources Management Wetlands Bureau Check the Status of your Application

RSA/Rule: RSA 482/ Env-Wt 524

APPLICANT LAST NAME, FIRST NAME, M.I.: Baker, Todd - Exeter Rose Farm LLC

This worksheet summarizes the criteria and requirements for a Standard Permit for "Residential, Commercial, and Industrial Development", one of the 18 specific project types in Chapter Env-Wt 500. In addition to the project-specific criteria and requirements on this worksheet, all Standard Dredge and Fill Applications must meet the criteria and requirements listed in the Standard Dredge and Fill Application form (NHDES-W-06-012).

SECTION 1 - APPLICABILITY (Env-Wt 509.02(b); Env-Wt 524.01)

The information in this worksheet applies to residential, commercial, and industrial development projects, including associated roadways, in non-tidal wetlands. Do not use this worksheet if the project is located in a coastal (tidal) area.

SECTION 2 - APPROVAL CRITERIA FOR RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT PROJECTS (Env-Wt 524.02)

- An application for a residential, commercial or industrial development project must meet the following criteria:
[X] The project must meet the applicable criteria established in Env-Wt 300;
[ ] An off-site alternatives analysis is conducted for any project that will result in more than one acre of permanent wetland impacts;
[X] The project avoids and minimizes impacts to wetlands, watercourses, and sensitive and valuable wetlands in accordance with Env-Wt 313.03;
[X] The project complies with the design criteria specified in Env-Wt 524.04 and the construction criteria specified in Env-Wt 524.05; and
[X] Compensatory mitigation is provided for any new residential, commercial, or industrial development in a Priority Resource Area.

SECTION 3 - APPLICATION REQUIREMENTS FOR RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT PROJECTS (Env-Wt 524.03)

- [X] For all projects requiring subdivision approval, a plan prepared and stamped by a land surveyor licensed in the State of New Hampshire pursuant to RSA 310-A showing existing and proposed topography and the location of all proposed lot lines;
[X] For all projects requiring subdivision approval, the following clearly delineated on the plan required above: the boundaries of all wetlands and surface waters and the footprint of all proposed impacts;

- For minor and major projects requiring subdivision approval, wetlands classifications clearly indicated in accordance with Env-Wt 400 on the plan required above; and
- For a project that is associated with one or more phases of a multi-phase subdivision, a project impact plan that also shows all wetlands on remaining property proposed for future phases of development.

Please note that permits for subdivisions of 4 or more lots shall not be effective until the permittee records the permit with the appropriate registry of deeds and a copy of the registered permit has been received by the department.

An application for a residential, commercial or industrial development project must include the following information:

- If the project includes components that are subject to multiple project-specific requirements in Chapter Env-Wt 500, a narrative statement and plan that describes how each project-specific component meets the requirements of the applicable part in Chapter Env-Wt 500 and how the project as a whole impacts jurisdictional areas.

**SECTION 4 - DESIGN REQUIREMENTS FOR RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT PROJECTS (Env-Wt 524.04)**

In addition to meeting the applicable design requirements established in Env-Wt 300, a residential, commercial, or industrial development project must be designed to meet the following criteria:

- The project complies with all applicable requirements of Env-Wt 400, Env-Wt 700, Env-Wt 800, Env-Wt 900, and other applicable project-specific criteria in Chapter Env-Wt 500;
- The project does not use wetlands or surface waters to serve as stormwater or water quality treatment to mitigate impacts;
- The project provides setbacks and water quality protection measures sufficient to protect private and public drinking water supplies, source water protection areas, and fisheries;
- The project maintains or restores hydrologic connections to maintain flows necessary to preserve adjacent wetland and riparian functions;
- The project maintains existing fishery spawning, feeding, or cover habitat and fish passage necessary to maintain fishery or habitat or populations; and
- The project maintains existing wetland-dependent wildlife habitat and its associated migratory pathways, reproductive sites, and associated wetland complex or wetland community system.

[irm@des.nh.gov](mailto: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](http://www.des.nh.gov)

## **SECTION 5 - CONSTRUCTION REQUIREMENTS FOR RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT PROJECTS (Env-Wt 525.05)**

In addition to meeting all applicable construction standards specified in Env-Wt 307 and other applicable project-specific standards in Chapter Env-Wt 500, the following requirements apply to residential, commercial, or industrial development projects:

- A construction notice shall be filed with the department at least 48 hours prior to commencing work; and
- All work shall be conducted in accordance with the approved plan.

## **SECTION 6 - CLASSIFICATION OF RESIDENTIAL AND COMMERCIAL OR INDUSTRIAL DEVELOPMENT PROJECTS (Env-Wt 524.06)**

Residential and commercial or industrial development projects shall be classified under Env-Wt 407 and as follows:

### ***(a) A project shall be a minimum impact project only if:***

- (1) All stream-crossing components of the project meet the requirements for minimum impact classification specified in Env-Wt 903;
- (2) All other components of the project meet the requirements for minimum impact classification specified in Env-Wt 407 and this chapter;
- (3) The project is not part of a new subdivision of 4 or more lots; and
- (4) The project does not meet the criteria listed in (d) below.

### ***(b) A project shall be an expedited minimum impact project only if:***

- (1) It is a minimum impact project to construct a new subdivision of 3 lots or less;
- (2) The applicant has attended a pre-design submission meeting with the department at least 7 days prior to application submission and included department feedback in the design plan; and
- (3) The project does not meet the criteria listed in (d) below.

### ***(c) A project shall be a minor impact project if the project does not meet the criteria listed in (d) below and if any of the following apply:***

- (1) Any single stream-crossing component of the project meets the requirements for minor impact classification specified in Env-Wt 903;
- (2) The project is part of a new subdivision of 4 or more lots;
- (3) Any single component of the project meets the requirements for minor impact classification specified in Env-Wt 407, Env-Wt 903, or Chapter Env-Wt 500; or
- (4) No component of the project meets the requirements for major impact classification specified in Env-Wt 407, Env-Wt 903, or Chapter Env-Wt 500.

### ***(d) A project shall be a major impact project if:***

- (1) The project exceeds the minor impact criteria;
- (2) The project requires mitigation or meets the requirements for major impact classification specified in Env-Wt 407, Env-Wt 903, or any other associated project classification that is part of the overall project; or
- (3) The project is elevated based on an aggregation undertaken by a developer or is part of a series of developments under Env-Wt 400.







# WETLANDS PERMIT APPLICATION STREAM CROSSING WORKSHEET

Water Division/Land Resources Management  
Wetlands Bureau



RSA/Rule RSA 482-A/ Env-Wt-900

This worksheet can be used to accompany Wetlands Permit Applications when proposing stream crossings.

### SECTION 1 - TIER CLASSIFICATIONS

Determine the contributing watershed size at [USGS StreamStats](#).

Note: Plans for tier 2 and 3 crossings shall be designed and stamped by a professional engineer who is licensed under RSA 310-A to practice in New Hampshire.

Size of contributing watershed at the crossing location: 544 acres

**Tier 1:** A tier 1 stream crossing is a crossing located on a watercourse where the contributing watershed size is less than or equal to 200 acres.

**Tier 2:** A tier 2 stream crossing is a crossing located on a watercourse where the contributing watershed size is greater than 200 acres and less than 640 acres.

**Tier 3:** A tier 3 stream crossing is a crossing that meets **any** of the following criteria:

On a watercourse where the contributing watershed is more than 640 acres.

Within a [designated river corridor](#) unless:

a. The crossing would be a tier 1 stream based on contributing watershed size, or

b. The structure does not create a direct surface water connection to the designated river as depicted on the national hydrography dataset as found on GRANIT.

Within a [100-year floodplain](#) (see Section 2 below).

In a jurisdictional area having any protected species or habitat ([NHB DataCheck](#)).

In a prime wetland or within a duly-established 100-foot buffer, unless a waiver has been granted pursuant to RSA 482-A:11, IV(b) and Env-Wt 706. Review the [Wetlands Permit Planning Tool \(WPPT\)](#) for town prime wetland and prime wetland buffer maps to determine if your project is within these areas.

**Tier 4:** A tier 4 stream crossing is a crossing located on a tidal watercourse.

### SECTION 2 - 100-YEAR FLOODPLAIN

Use the [FEMA Map Service Center](#) to determine if the crossing is located within a 100-year floodplain. Please answer the questions below:

**No:** The proposed stream crossing *is not* within the FEMA 100-year floodplain.

**Yes:** The proposed project *is* within the FEMA 100-year floodplain. Zone = AE

Elevation of the 100-year floodplain at the inlet: 8 feet (FEMA El. or Modeled El.)

### SECTION 3 - CALCULATING PEAK DISCHARGE

Existing 100-year peak discharge (Q) calculated in cubic feet per second (CFS): 210 CFS

Calculation method: Stream Stats

Estimated bankfull discharge at the crossing location: 9.39 CFS

Calculation method: Manning

[lrn@des.nh.gov](mailto:lrn@des.nh.gov) or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

[www.des.nh.gov](http://www.des.nh.gov)

➔ *Note: If tier 1, then skip to Section 10* ➔

**SECTION 4 - PREDICTED CHANNEL GEOMETRY BASED ON REGIONAL HYDRAULIC CURVES**

*For tier 2, tier 3 and tier 4 crossings only.*

Bankfull Width: 16 feet

Mean Bankfull Depth: 4.75 feet

Bankfull Cross Sectional Area: 76 square feet (SF)

**SECTION 5 - CROSS SECTIONAL CHANNEL GEOMETRY: MEASUREMENTS OF THE EXISTING STREAM WITHIN A REFERENCE REACH**

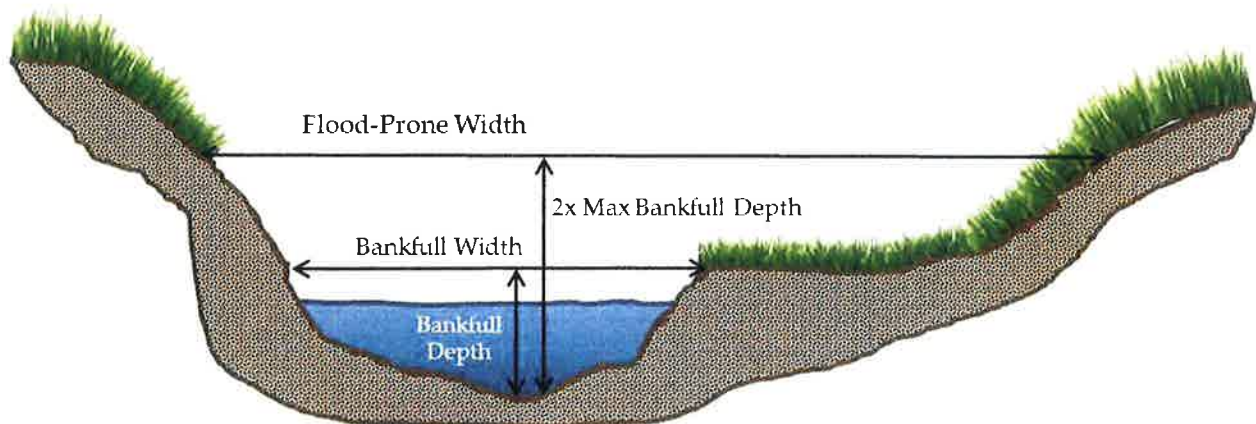
*For tier 2, tier 3 and tier 4 crossings only.*

Describe the reference reach location: 200' Upstream of Oak Street Ext to 100' Downstream

Reference reach watershed size: 544 acres

Parameter	Cross Section 1 Describe bed form 200' Upstream <i>(e.g. pool, riffle, glide)</i>	Cross Section 2 Describe bed form 100' Upstream <i>(e.g. pool, riffle, glide)</i>	Cross Section 3 Describe bed form 100' Downstream <i>(e.g. pool, riffle, glide)</i>	Range
<a href="#">Bankfull Width</a>	11.4 feet	9.9 feet	13.5 feet	9.9-13.5 feet
<a href="#">Bankfull Cross Sectional Area</a>	15.2 SF	3.9 SF	8.4 SF	3.9-15.2 SF
Mean <a href="#">Bankfull Depth</a>	2.1 feet	0.6 feet	1.3 feet	0.6-2.1 feet
<a href="#">Width to Depth Ratio</a>	5.5	17.1	10.2	5.5-17.1
Max <a href="#">Bankfull Depth</a>	4.1 feet	1.2 feet	2.6 feet	1.2-4.1 feet
<a href="#">Flood Prone Width</a>	99 feet	59 feet	65.5 feet	55.8-99 feet
<a href="#">Entrenchment Ratio</a>	8.7	6.0	4.9	4.9-8.7

Use **Figure 1** below to determine the measurements of the Reference Reach Attributes



**Figure 1:** Determining the Reference Reach Attributes.

**SECTION 6 - LONGITUDINAL PARAMETERS OF THE REFERENCE REACH AND CROSSING LOCATION**

*For tier 2, tier 3 and tier 4 crossings only.*

Average Channel Slope of the Reference Reach: 0.008 ft/ft

Average Channel Slope at the Crossing Location: 0.030 ft/ft

**SECTION 7 - PLAN VIEW GEOMETRY**

Note: Sinuosity is measured a distance of at least 20 times bankfull width, or 2 meander belt widths.

*For tier 2, tier 3 and tier 4 crossings only.*

Sinuosity of the Reference Reach: 1.4	
Sinuosity of the Crossing Location: 1.0	
<b>SECTION 8 - SUBSTRATE CLASSIFICATION BASED ON FIELD OBSERVATIONS</b>	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
% of reach that is bedrock:	0 %
% of reach that is boulder:	0 %
% of reach that is cobble:	0 %
% of reach that is gravel:	5 (brick mostly) %
% of reach that is sand:	0 %
% of reach that is silt:	95 %
<b>SECTION 9 - STREAM TYPE OF REFERENCE REACH</b>	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
Stream Type of Reference Reach:	E

Refer to Rosgen Classification Chart (**Figure 2**) below:

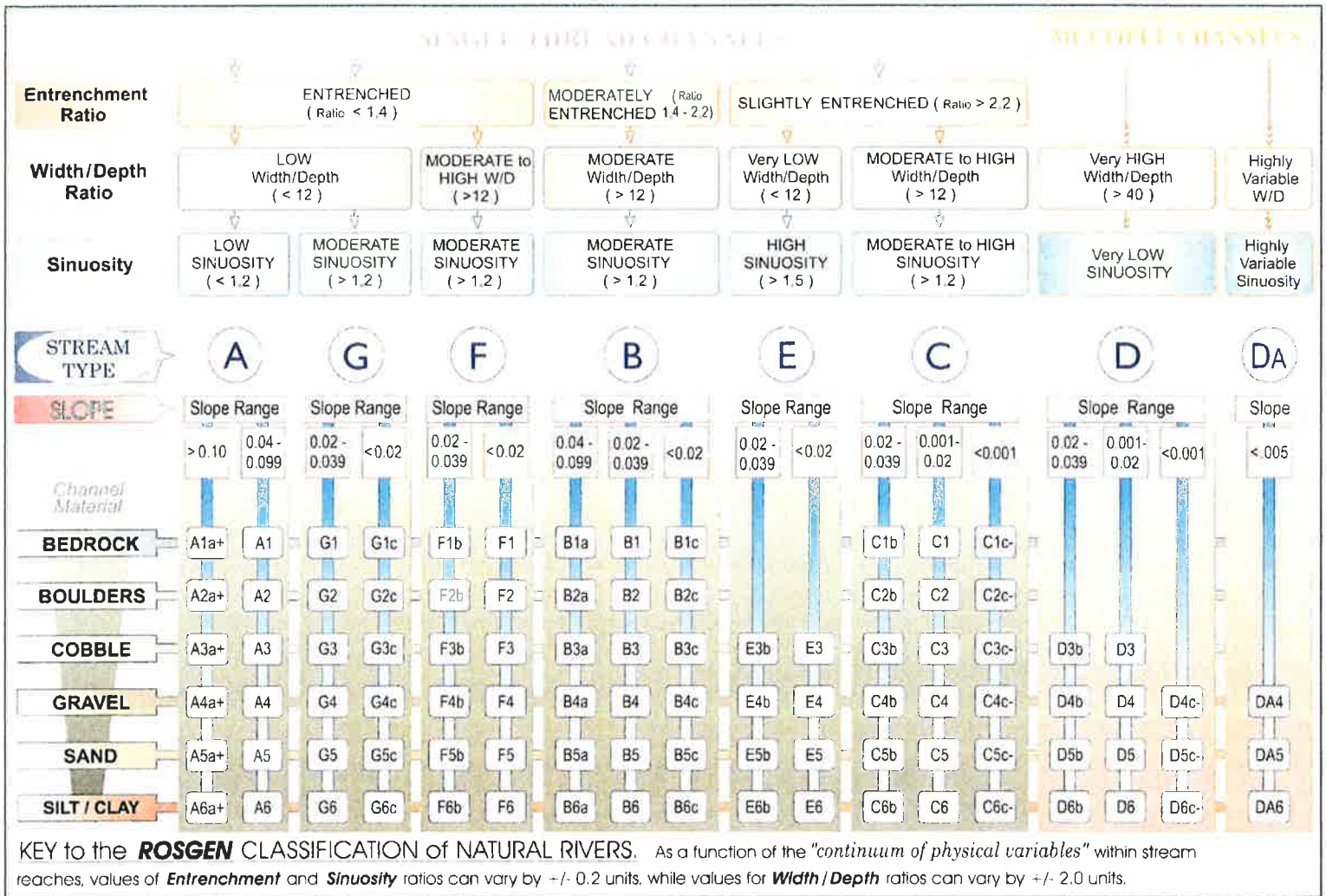


Figure 2: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 10 - CROSSING STRUCTURE METRICS						
<b>Existing Conditions</b>	<b>Existing Structure Type:</b>	<input type="checkbox"/> Bridge span <input type="checkbox"/> Pipe arch <input type="checkbox"/> Open-bottom culvert <input type="checkbox"/> Closed-bottom culvert <input type="checkbox"/> Closed-bottom culvert with stream simulation <input checked="" type="checkbox"/> Other: Open Channel				
	<b>Existing Crossing Span:</b> <i>(perpendicular to flow)</i>	11.7 feet	<b>Culvert Diameter:</b> Channel feet			
	<b>Existing Crossing Length:</b> <i>(parallel to flow)</i>	40 feet	<b>Inlet Elevation:</b> El. 6.18 feet			
<b>Proposed Conditions</b>	<b>Existing Crossing Length:</b> <i>(parallel to flow)</i>	40 feet	<b>Outlet Elevation:</b> El. 4.98 feet			
	<b>Proposed Structure Type:</b>		<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Alternative Design</b>
	Bridge Span		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Pipe Arch		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Closed-bottom Culvert		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Open-bottom Culvert		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Closed-bottom Culvert with stream simulation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Proposed Structure Span:</b>	24 feet	<b>Culvert Diameter:</b> 24'x5.75' feet				

(perpendicular to flow)	Inlet Elevation: El. 6.18 feet
Proposed Structure Length: 37.5 feet (parallel to flow)	Outlet Elevation: El. 4.98 feet Culvert Slope: 0.032 ft/ft
<b>Proposed Entrenchment Ratio* 1.4</b> For <b>Tier 2, Tier 3 and Tier 4</b> Crossings Only. To accommodate the entrenchment ratio, floodplain drainage structures may be utilized.	

\* Note: Proposed Entrenchment Ratio must meet the minimum ratio for each stream type listed in **Figure 3**, otherwise the applicant must address the Alternative Design criteria listed in Env-Wt 904.10.

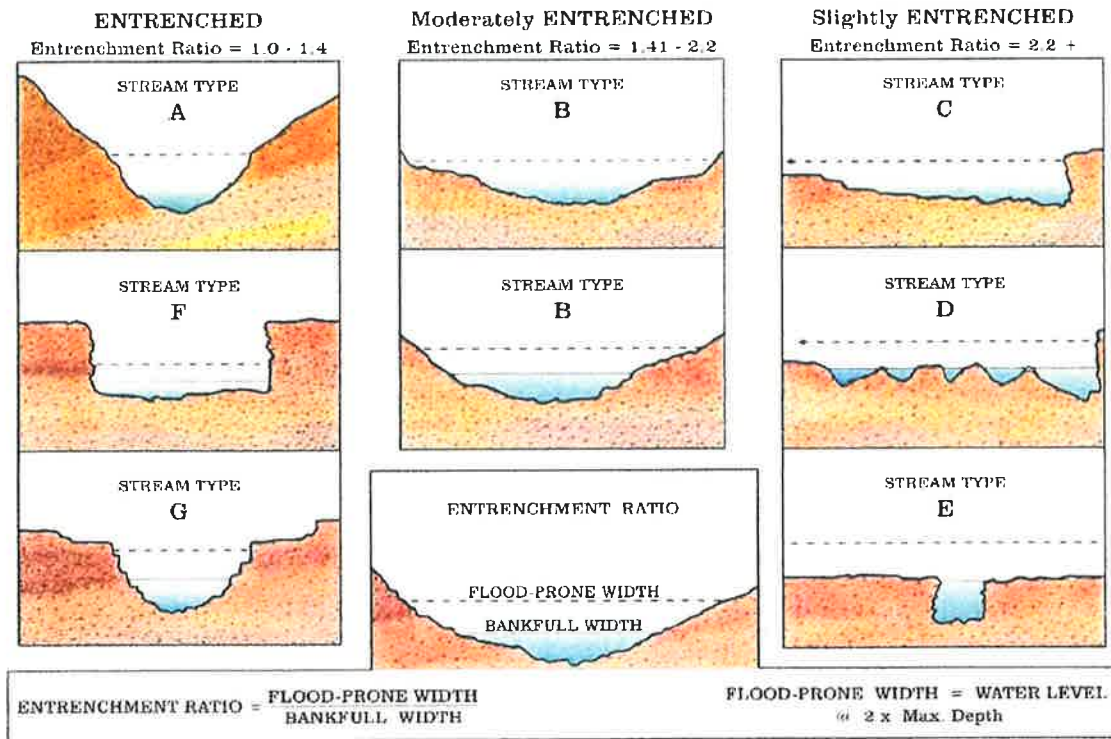


Figure 3: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 11 - CROSSING STRUCTURE HYDRAULICS		
	Existing	Proposed
100 year flood stage elevation at inlet:	7.86	10.25
Flow velocity at outlet in feet per second (FPS):	8.08	2.15
Calculated 100 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		210
Calculated 50 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		169
SECTION 12 - CROSSING STRUCTURE OPENNESS RATIO		
<i>For tier 2, tier 3 and tier 4 crossings only.</i>		
<b>Crossing Structure Openness Ratio* = 3.5</b>		
* Openness box culvert = (height x width)/length		
Openness round culvert = (3.14 x radius <sup>2</sup> )/length		

### SECTION 13 - GENERAL DESIGN CONSIDERATIONS

Env-Wt 904.01 requires all stream crossings to be designed and constructed according to the following requirements. Check each box if the project meets these general design considerations.

All stream crossings shall be designed and constructed so as to:

- Not be a barrier to sediment transport.
- Prevent the restriction of high flows and maintain existing low flows.
- Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.
- Not cause an increase in the frequency of flooding or overtopping of banks.
- Maintain or enhance geomorphic compatibility by:
  - a. Minimizing the potential for inlet obstruction by sediment, wood, or debris, and
  - b. Preserving the natural alignment of the stream channel.
- Preserve watercourse connectivity where it currently exists.
- Restore watercourse connectivity where:
  - a. Connectivity previously was disrupted as a result of human activity(ies), and
  - b. Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both.
- Not cause erosion, aggradation, or scouring upstream or downstream of the crossing.
- Not cause water quality degradation.

### SECTION 14 - TIER-SPECIFIC DESIGN CRITERIA

Stream crossings must be designed in accordance with the tier specific design criteria listed in Part Env-Wt 904.

- The proposed project meets the tier specific design criteria listed in Part Env-Wt 904 and each requirement has been addressed in the plans and as part of the wetland application.

### SECTION 15 - ALTERNATIVE DESIGN

**NOTE:** If the proposed crossing does not meet all of the general design considerations, the tier specific design criteria, or the minimum entrenchment ratio for each given stream type listed in **Figure 3**, then an alternative design plan and associated requirements must be addressed pursuant to Env-Wt 904.10.

- I have submitted an alternative design and addressed each requirement listed in Env-Wt 904.10.

**47175-00\_Stream-Cross\_Norris Brook-Pre\_2021-05-27**

Pre-Development Storm - New Crossing

*Storm depth is zero*

Prepared by {enter your company name here}

Printed 6/1/2021

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Reach ER2-050: Existing** Avg. Flow Depth=1.59' Max Vel=8.11 fps Inflow=169.00 cfs 14,366,145 cf  
n=0.030 L=37.5' S=0.0328 '/ Capacity=10,065.09 cfs Outflow=169.00 cfs 14,365,127 cf

**Reach ER2-100: Existing** Avg. Flow Depth=1.68' Max Vel=8.08 fps Inflow=210.00 cfs 17,877,487 cf  
n=0.030 L=37.5' S=0.0328 '/ Capacity=10,065.09 cfs Outflow=210.00 cfs 17,876,316 cf

**47175-00\_Stream-Cross\_Norris\_Brook-Post\_2021-05-27**

Post-Development Storm - New Crossing

Storm depth is zero

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**Summary for Pond PC3-050: Norris Brook Crossing**

Inflow = 169.00 cfs @ 6.96 hrs, Volume= 14,364,312 cf, Incl. 33.00 cfs Base Flow  
 Outflow = 169.00 cfs @ 6.97 hrs, Volume= 14,361,030 cf, Atten= 0%, Lag= 0.6 min  
 Primary = 169.00 cfs @ 6.97 hrs, Volume= 14,361,030 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 9.98' @ 6.98 hrs Surf.Area= 2,597 sf Storage= 3,281 cf

Plug-Flow detention time= 0.3 min calculated for 14,355,049 cf (100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 731.9 - 731.8 )

Volume #1	Invert 7.00'	Avail.Storage 14,494 cf	Storage Description Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
7.00	55	32.0	0	0	55	
8.00	678	147.3	309	309	1,703	
9.00	1,427	268.7	1,030	1,338	5,727	
10.00	2,625	496.6	1,996	3,334	19,611	
11.00	5,340	564.8	3,903	7,237	25,396	
12.00	9,360	657.0	7,257	14,494	34,381	

Device #1	Routing Primary	Invert 6.18'	Outlet Devices
<b>192.0" W x 57.0" H Box 16x5'-9" Box Culvert</b>			
L= 40.0' Box, headwall w/3 square edges, Ke= 0.500			
Inlet / Outlet Invert= 6.18' / 4.98' S= 0.0300 '/ Cc= 0.900			
n= 0.012 Concrete pipe, finished, Flow Area= 76.00 sf			

Primary OutFlow Max=169.00 cfs @ 6.97 hrs HW=9.98' TW=9.62' (Dynamic Tailwater)  
 1=16x5'-9" Box Culvert (Inlet Controls 169.00 cfs @ 2.78 fps)

**Summary for Pond PC3-100: Norris Brook Crossing**

Inflow = 210.00 cfs @ 6.13 hrs, Volume= 17,884,445 cf, Incl. 41.00 cfs Base Flow  
 Outflow = 210.00 cfs @ 6.13 hrs, Volume= 17,879,586 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 210.00 cfs @ 6.13 hrs, Volume= 17,879,586 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 10.48' @ 6.17 hrs Surf.Area= 3,801 sf Storage= 4,858 cf

Plug-Flow detention time= 0.4 min calculated for 17,872,137 cf (100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 730.7 - 730.5 )

Volume #1	Invert 7.00'	Avail.Storage 14,494 cf	Storage Description Custom Stage Data (Irregular) Listed below (Recalc)			
-----------	--------------	-------------------------	---	--	--	--



**47175-00\_Stream-Cross\_Norris Brook-Post\_2021-05-27**

Storm depth is zero

Prepared by {enter your company name here}

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
7.00	55	32.0	0	0	55
8.00	678	147.3	309	309	1,703
9.00	1,427	268.7	1,030	1,338	5,727
10.00	2,625	496.6	1,996	3,334	19,611
11.00	5,340	564.8	3,903	7,237	25,396
12.00	9,360	657.0	7,257	14,494	34,381

Device	Routing	Invert	Outlet Devices
#1	Primary	6.18'	<b>192.0" W x 57.0" H Box 16x5'-9" Box Culvert</b> L= 37.5' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 6.18' / 4.98' S= 0.0320 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 76.00 sf

**Primary OutFlow** Max=210.00 cfs @ 6.13 hrs HW=10.48' TW=10.05' (Dynamic Tailwater)  
 ↳ **1=16x5'-9" Box Culvert** (Inlet Controls 210.00 cfs @ 3.05 fps)

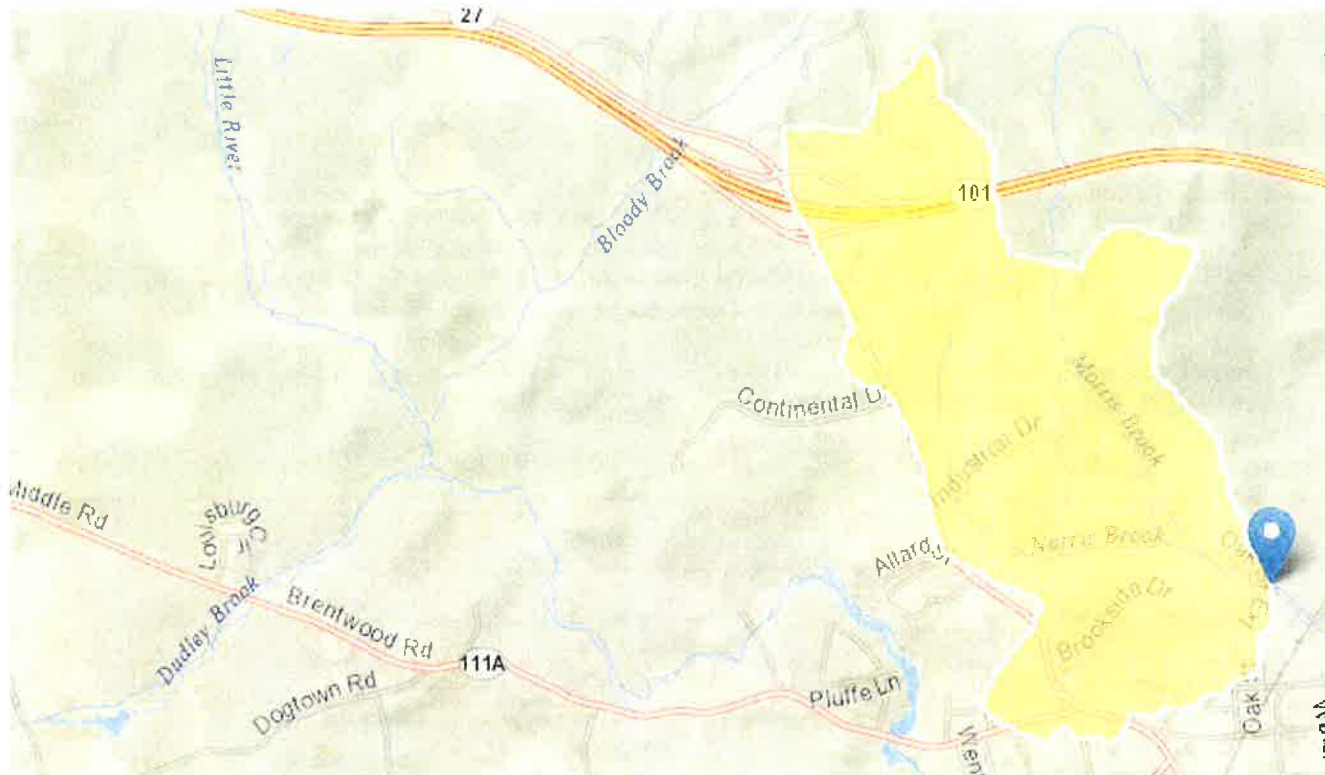
# StreamStats Report

Region ID: NH

Workspace ID: NH20210525152200184000

Clicked Point (Latitude, Longitude): 42.98927, -70.95501

Time: 2021-05-25 11:22:16 -0400



## Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.85	square miles
APRAVPRE	Mean April Precipitation	4.243	inches
WETLAND	Percentage of Wetlands	2.22	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	54.8	feet per mi

## Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.85	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	4.243	inches	2.79	6.23
WETLAND	Percent Wetlands	2.22	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	54.8	feet per mi	5.43	543

## Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	Plu	SEp	Equiv. Yrs.
50-percent AEP flood	39	ft <sup>3</sup> /s	23.4	65.1	30.1	3.2
20-percent AEP flood	69.5	ft <sup>3</sup> /s	40.9	118	31.1	4.7
10-percent AEP flood	96.6	ft <sup>3</sup> /s	55.6	168	32.3	6.2
4-percent AEP flood	136	ft <sup>3</sup> /s	75.4	245	34.3	8
2-percent AEP flood	169	ft <sup>3</sup> /s	90.6	315	36.4	9
1-percent AEP flood	210	ft <sup>3</sup> /s	108	407	38.6	9.8
0.2-percent AEP flood	317	ft <sup>3</sup> /s	150	670	44.1	11

*Peak-Flow Statistics Citations*

**Olson, S.A., 2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S. Geological Survey Scientific Investigations Report 2008-5206, 57 p. (<http://pubs.usgs.gov/sir/2008/5206/>)**

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USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.5.3

StreamStats Services Version: 1.2.22

NSS Services Version: 2.1.2



## WETLANDS PERMIT APPLICATION STREAM CROSSING WORKSHEET

Water Division/Land Resources Management  
Wetlands Bureau



RSA/Rule RSA 482-A/ Env-Wt-900

This worksheet can be used to accompany Wetlands Permit Applications when proposing stream crossings.

### SECTION 1 - TIER CLASSIFICATIONS

Determine the contributing watershed size at [USGS StreamStats](#).

Note: Plans for tier 2 and 3 crossings shall be designed and stamped by a professional engineer who is licensed under RSA 310-A to practice in New Hampshire.

Size of contributing watershed at the crossing location: 442 acres

- Tier 1: A tier 1 stream crossing is a crossing located on a watercourse where the contributing watershed size is less than or equal to 200 acres.
- Tier 2: A tier 2 stream crossing is a crossing located on a watercourse where the contributing watershed size is greater than 200 acres and less than 640 acres.
- Tier 3: A tier 3 stream crossing is a crossing that meets **any** of the following criteria:
  - On a watercourse where the contributing watershed is more than 640 acres.
  - Within a [designated river corridor](#) unless:
    - a. The crossing would be a tier 1 stream based on contributing watershed size, or
    - b. The structure does not create a direct surface water connection to the designated river as depicted on the national hydrography dataset as found on GRANIT.
  - Within a [100-year floodplain](#) (see Section 2 below).
  - In a jurisdictional area having any protected species or habitat ([NHB DataCheck](#)).
  - In a prime wetland or within a duly-established 100-foot buffer, unless a waiver has been granted pursuant to RSA 482-A:11, IV(b) and Env-Wt 706. Review the [Wetlands Permit Planning Tool \(WPPT\)](#) for town prime wetland and prime wetland buffer maps to determine if your project is within these areas.
- Tier 4: A tier 4 stream crossing is a crossing located on a tidal watercourse.

### SECTION 2 - 100-YEAR FLOODPLAIN

Use the [FEMA Map Service Center](#) to determine if the crossing is located within a 100-year floodplain. Please answer the questions below:

- No: The proposed stream crossing *is not* within the FEMA 100-year floodplain.
- Yes: The proposed project *is* within the FEMA 100-year floodplain. Zone =  
Elevation of the 100-year floodplain at the inlet:            feet (FEMA El. or Modeled El.)

### SECTION 3 - CALCULATING PEAK DISCHARGE

Existing 100-year peak discharge (Q) calculated in cubic feet per second (CFS): 169 CFS	Calculation method: Stream Stats
Estimated bankfull discharge at the crossing location: 80.2 CFS	Calculation method: Inlet Control

[irm@des.nh.gov](mailto: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](http://www.des.nh.gov)

➔ **Note: If tier 1, then skip to Section 10** ➔

**SECTION 4 - PREDICTED CHANNEL GEOMETRY BASED ON REGIONAL HYDRAULIC CURVES**

*For tier 2, tier 3 and tier 4 crossings only.*

Bankfull Width: 3 feet

Mean Bankfull Depth: 3 feet

Bankfull Cross Sectional Area: 7.1 square feet (SF)

**SECTION 5 - CROSS SECTIONAL CHANNEL GEOMETRY: MEASUREMENTS OF THE EXISTING STREAM WITHIN A REFERENCE REACH**

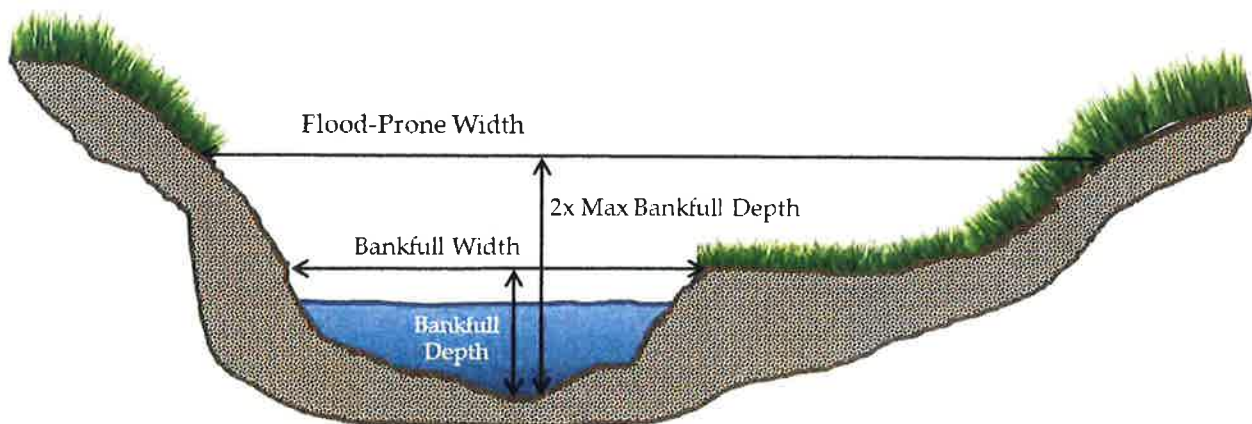
*For tier 2, tier 3 and tier 4 crossings only.*

Describe the reference reach location: 200' Upstream of Oak Street Ex to 100' Downstream

Reference reach watershed size: 442 acres

Parameter	Cross Section 1 Describe bed form 200' Upstream (e.g. pool, riffle, glide)	Cross Section 2 Describe bed form 100' Upstream (e.g. pool, riffle, glide)	Cross Section 3 Describe bed form 100' Downstream (e.g. pool, riffle, glide)	Range
<a href="#">Bankfull Width</a>	11.4 feet	10.4 feet	13.5 feet	10.4-13.5 feet
<a href="#">Bankfull Cross Sectional Area</a>	15.2 SF	5.5 SF	8.4 SF	5.5-15.2 SF
Mean <a href="#">Bankfull Depth</a>	2.1 feet	1.1 feet	1.3 feet	1.1-2.1 feet
<a href="#">Width to Depth Ratio</a>	5.5	9.2	10.2	5.5-10.2
Max <a href="#">Bankfull Depth</a>	4.1 feet	2.3 feet	2.6 feet	2.3-4.1 feet
<a href="#">Flood Prone Width</a>	99 feet	63 feet	68 feet	63-99 feet
<a href="#">Entrenchment Ratio</a>	8.7	6.1	5.1	5.1-8.7

Use **Figure 1** below to determine the measurements of the Reference Reach Attributes



**Figure 1:** Determining the Reference Reach Attributes.

**SECTION 6 - LONGITUDINAL PARAMETERS OF THE REFERENCE REACH AND CROSSING LOCATION**

*For tier 2, tier 3 and tier 4 crossings only.*

Average Channel Slope of the Reference Reach: 0.005 ft/ft

Average Channel Slope at the Crossing Location: 0.008 ft/ft

**SECTION 7 - PLAN VIEW GEOMETRY**

Note: Sinuosity is measured a distance of at least 20 times bankfull width, or 2 meander belt widths.

<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
Sinuosity of the Reference Reach:	
Sinuosity of the Crossing Location:	
<b>SECTION 8 - SUBSTRATE CLASSIFICATION BASED ON FIELD OBSERVATIONS</b>	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
% of reach that is bedrock:	<b>0 %</b>
% of reach that is boulder:	<b>0 %</b>
% of reach that is cobble:	<b>0 %</b>
% of reach that is gravel:	<b>0 %</b>
% of reach that is sand:	<b>20 (due to erosion) %</b>
% of reach that is silt:	<b>80 %</b>
<b>SECTION 9 - STREAM TYPE OF REFERENCE REACH</b>	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
Stream Type of Reference Reach:	<b>E</b>

Refer to Rosgen Classification Chart (**Figure 2**) below:

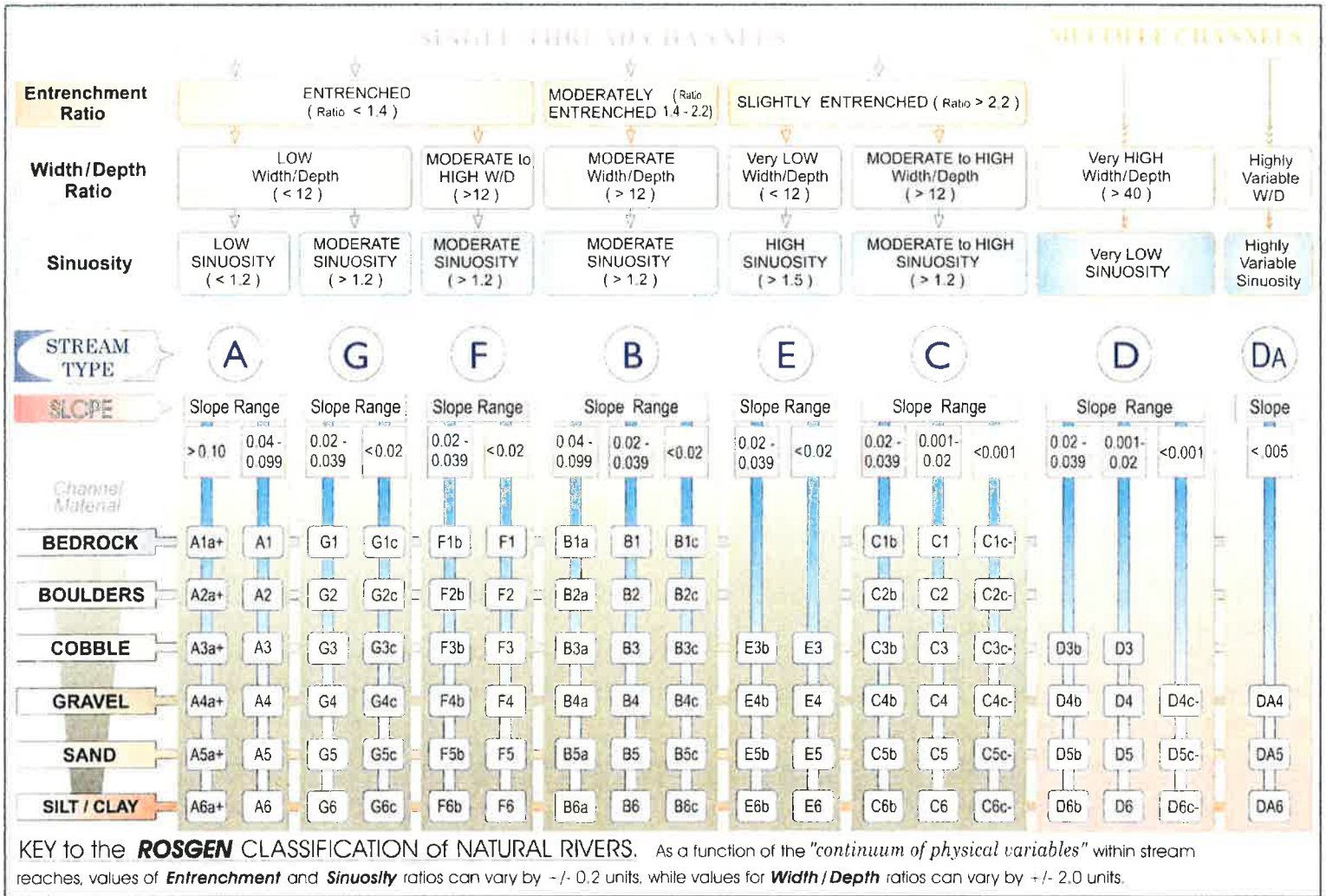


Figure 2: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 10 - CROSSING STRUCTURE METRICS						
<b>Existing Conditions</b>	<b>Existing Structure Type:</b>		<input type="checkbox"/> Bridge span <input type="checkbox"/> Pipe arch <input type="checkbox"/> Open-bottom culvert <input type="checkbox"/> Closed-bottom culvert <input type="checkbox"/> Closed-bottom culvert with stream simulation <input checked="" type="checkbox"/> Other: 36" RCP Culvert			
	<b>Existing Crossing Span:</b> (perpendicular to flow)		40 feet	<b>Culvert Diameter:</b> 3 feet		
	<b>Existing Crossing Length:</b> (parallel to flow)		40 feet	<b>Inlet Elevation:</b> El. 9.54 feet		
<b>Proposed Conditions</b>	<b>Proposed Structure Type:</b>		<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Alternative Design</b>
	Bridge Span		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Pipe Arch		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Closed-bottom Culvert		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Open-bottom Culvert		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Closed-bottom Culvert with stream simulation		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Proposed Structure Span:</b>		4 feet	<b>Culvert Diameter:</b> 4x3 feet			



(perpendicular to flow)	<b>Inlet Elevation:</b> El. 11.30 (top of rock) feet
<b>Proposed Structure Length:</b> 45 feet	<b>Outlet Elevation:</b> El. 10.40 (top of rock) feet
(parallel to flow)	<b>Culvert Slope:</b> 0.02
<b>Proposed Entrenchment Ratio:* 15.7</b>	
For <b>Tier 2, Tier 3 and Tier 4</b> Crossings Only. To accommodate the entrenchment ratio, floodplain drainage structures may be utilized.	

\* Note: Proposed Entrenchment Ratio must meet the minimum ratio for each stream type listed in **Figure 3**, otherwise the applicant must address the Alternative Design criteria listed in Env-Wt 904.10.

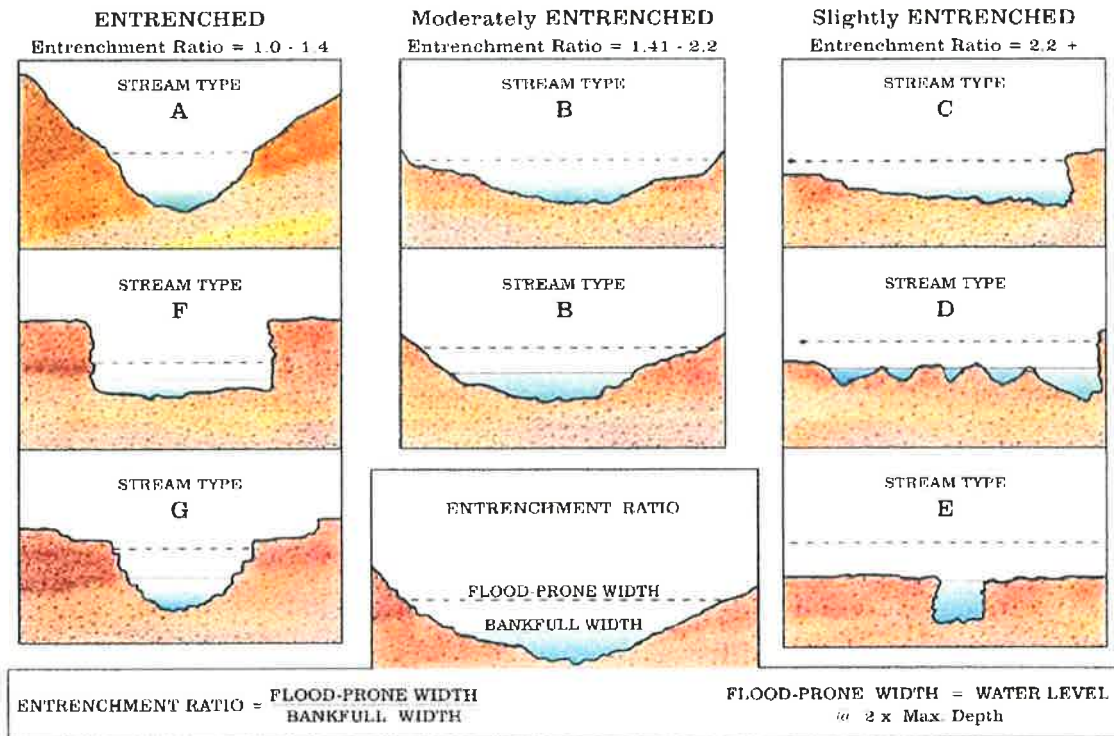


Figure 3: Reference from Applied River Morphology, Rosgen, 1996.

<b>SECTION 11 - CROSSING STRUCTURE HYDRAULICS</b>		
	<b>Existing</b>	<b>Proposed</b>
100 year flood stage elevation at inlet:	16.9	16.67
Flow velocity at outlet in feet per second (FPS):	11.54	11.15
Calculated 100 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		111.5
Calculated 50 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		109.9
<b>SECTION 12 - CROSSING STRUCTURE OPENNESS RATIO</b>		
For <b>tier 2, tier 3 and tier 4</b> crossings only.		
<b>Crossing Structure Openness Ratio*</b> = (2.5'x 4')/45 = 0.2		
* Openness box culvert = (height x width)/length		
Openness round culvert = (3.14 x radius <sup>2</sup> )/length		

### SECTION 13 - GENERAL DESIGN CONSIDERATIONS

Env-Wt 904.01 requires all stream crossings to be designed and constructed according to the following requirements. Check each box if the project meets these general design considerations.

All stream crossings shall be designed and constructed so as to:

- Not be a barrier to sediment transport.
- Prevent the restriction of high flows and maintain existing low flows.
- Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.
- Not cause an increase in the frequency of flooding or overtopping of banks.
- Maintain or enhance geomorphic compatibility by:
  - a. Minimizing the potential for inlet obstruction by sediment, wood, or debris, and
  - b. Preserving the natural alignment of the stream channel.
- Preserve watercourse connectivity where it currently exists.
- Restore watercourse connectivity where:
  - a. Connectivity previously was disrupted as a result of human activity(ies), and
  - b. Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both.
- Not cause erosion, aggradation, or scouring upstream or downstream of the crossing.
- Not cause water quality degradation.

### SECTION 14 - TIER-SPECIFIC DESIGN CRITERIA

Stream crossings must be designed in accordance with the tier specific design criteria listed in Part Env-Wt 904.

- The proposed project meets the tier specific design criteria listed in Part Env-Wt 904 and each requirement has been addressed in the plans and as part of the wetland application.

### SECTION 15 - ALTERNATIVE DESIGN

**NOTE:** If the proposed crossing does not meet all of the general design considerations, the tier specific design criteria, or the minimum entrenchment ratio for each given stream type listed in **Figure 3**, then an alternative design plan and associated requirements must be addressed pursuant to Env-Wt 904.10.

- I have submitted an alternative design and addressed each requirement listed in Env-Wt 904.10.

**47175-00\_Stream-Cross\_Norris Brook-Pre\_2021-05-27**

Storm depth is zero

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Page 1

**Summary for Pond EC4-050: Cross Pipe At Oak St Extension**

Inflow = 136.00 cfs @ 0.00 hrs, Volume= 11,755,296 cf, Incl. 136.00 cfs Base Flow  
 Outflow = 136.00 cfs @ 6.62 hrs, Volume= 11,547,911 cf, Atten= 0%, Lag= 397.2 min  
 Primary = 80.23 cfs @ 1.47 hrs, Volume= 6,902,476 cf  
 Secondary = 55.77 cfs @ 6.62 hrs, Volume= 4,645,435 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 16.55' @ 6.61 hrs Surf.Area= 99,354 sf Storage= 207,385 cf

Plug-Flow detention time= 25.5 min calculated for 11,540,961 cf (98% of inflow)  
 Center-of-Mass det. time= 12.5 min ( 732.5 - 720.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	9.50'	301,305 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
9.50	4	15.0	0	0	4
10.00	4	15.1	2	2	12
11.00	387	154.8	143	145	1,902
12.00	2,182	215.5	1,163	1,308	3,700
14.00	32,458	1,775.8	28,704	30,012	250,958
15.00	57,893	1,918.0	44,566	74,578	292,797
16.00	99,354	2,769.6	77,696	152,274	610,476
17.50	99,354	2,769.6	149,031	301,305	614,630

Device	Routing	Invert	Outlet Devices
#1	Primary	10.83'	<b>36.0" Round RCP_Round 36"</b> L= 40.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 9.54' / 10.83' S= -0.0323 ' / S= -0.0323 ' / Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Secondary	16.00'	<b>50.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=80.23 cfs @ 1.47 hrs HW=16.55' TW=12.99' (Dynamic Tailwater)  
 ↑1=RCP\_Round 36" (Inlet Controls 80.23 cfs @ 11.35 fps)

**Secondary OutFlow** Max=55.77 cfs @ 6.62 hrs HW=16.55' TW=13.00' (Dynamic Tailwater)  
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 55.77 cfs @ 2.01 fps)

**Summary for Pond EC4-100: Cross Pipe At Oak St Extension**

Inflow = 169.00 cfs @ 0.00 hrs, Volume= 14,607,684 cf, Incl. 169.00 cfs Base Flow  
 Outflow = 169.00 cfs @ 6.01 hrs, Volume= 14,370,211 cf, Atten= 0%, Lag= 360.6 min  
 Primary = 81.55 cfs @ 5.47 hrs, Volume= 7,024,288 cf  
 Secondary = 87.45 cfs @ 6.01 hrs, Volume= 7,345,923 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

**47175-00\_Stream-Cross\_Norris Brook-Pre\_2021-05-27**

Storm depth is zero

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Page 2

Peak Elev= 16.86' @ 6.00 hrs Surf.Area= 99,354 sf Storage= 237,473 cf

Plug-Flow detention time= 23.5 min calculated for 14,367,522 cf (98% of inflow)  
Center-of-Mass det. time= 11.6 min ( 731.6 - 720.0 )

Volume	Invert	Avail.Storage	Storage Description			
#1	9.50'	301,305 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
9.50	4	15.0	0	0	4	
10.00	4	15.1	2	2	12	
11.00	387	154.8	143	145	1,902	
12.00	2,182	215.5	1,163	1,308	3,700	
14.00	32,458	1,775.8	28,704	30,012	250,958	
15.00	57,893	1,918.0	44,566	74,578	292,797	
16.00	99,354	2,769.6	77,696	152,274	610,476	
17.50	99,354	2,769.6	149,031	301,305	614,630	

Device	Routing	Invert	Outlet Devices
#1	Primary	10.83'	<b>36.0" Round RCP_Round 36"</b> L= 40.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 9.54' / 10.83' S= -0.0323 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Secondary	16.10'	<b>50.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=81.55 cfs @ 5.47 hrs HW=16.86' TW=13.18' (Dynamic Tailwater)

↳1=RCP\_Round 36" (Inlet Controls 81.55 cfs @ 11.54 fps)

**Secondary OutFlow** Max=87.45 cfs @ 6.01 hrs HW=16.86' TW=13.18' (Dynamic Tailwater)

↳2=Broad-Crested Rectangular Weir (Weir Controls 87.45 cfs @ 2.31 fps)

**47175-00\_Stream-Cross\_Norris Brook-Post\_2021-05-27**

Storm depth is zero

Prepared by {enter your company name here}

Printed 6/1/2021

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Page 1

**Summary for Pond PC4-050: Cross Pipe At Oak St Extension**

Inflow = 136.00 cfs @ 0.00 hrs, Volume= 11,755,296 cf, Incl. 136.00 cfs Base Flow  
 Outflow = 136.00 cfs @ 6.99 hrs, Volume= 11,545,513 cf, Atten= 0%, Lag= 419.4 min  
 Primary = 91.27 cfs @ 6.92 hrs, Volume= 7,840,543 cf  
 Secondary = 44.73 cfs @ 6.99 hrs, Volume= 3,704,970 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 16.58' @ 6.98 hrs Surf.Area= 99,354 sf Storage= 209,783 cf

Plug-Flow detention time= 25.7 min calculated for 11,538,532 cf (98% of inflow)  
 Center-of-Mass det. time= 12.6 min ( 732.6 - 720.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	9.50'	301,305 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
9.50	4	15.0	0	0	4
10.00	4	15.1	2	2	12
11.00	387	154.8	143	145	1,902
12.00	2,182	215.5	1,163	1,308	3,700
14.00	32,458	1,775.8	28,704	30,012	250,958
15.00	57,893	1,918.0	44,566	74,578	292,797
16.00	99,354	2,769.6	77,696	152,274	610,476
17.50	99,354	2,769.6	149,031	301,305	614,630

Device	Routing	Invert	Outlet Devices
#1	Primary	11.30'	<b>48.0" W x 36.0" H Box Box Culvert 48x36 w/ 12.0" inside fill</b> L= 40.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 10.30' / 9.90' S= 0.0100 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 8.00 sf
#2	Secondary	16.10'	<b>50.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=91.27 cfs @ 6.92 hrs HW=16.58' TW=12.96' (Dynamic Tailwater)  
 ↳1=Box Culvert 48x36 (Inlet Controls 91.27 cfs @ 11.41 fps)

**Secondary OutFlow** Max=44.73 cfs @ 6.99 hrs HW=16.58' TW=12.96' (Dynamic Tailwater)  
 ↳2=Broad-Crested Rectangular Weir (Weir Controls 44.73 cfs @ 1.87 fps)

**Summary for Pond PC4-100: Cross Pipe At Oak St Extension**

Inflow = 169.00 cfs @ 0.00 hrs, Volume= 14,607,684 cf, Incl. 169.00 cfs Base Flow  
 Outflow = 169.00 cfs @ 6.15 hrs, Volume= 14,376,622 cf, Atten= 0%, Lag= 369.0 min  
 Primary = 91.92 cfs @ 6.02 hrs, Volume= 7,911,270 cf  
 Secondary = 77.08 cfs @ 6.15 hrs, Volume= 6,465,352 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 16.79' @ 6.15 hrs Surf.Area= 99,354 sf Storage= 231,062 cf

Plug-Flow detention time= 22.9 min calculated for 14,367,911 cf (98% of inflow)  
 Center-of-Mass det. time= 11.2 min ( 731.2 - 720.0 )

Volume	Invert	Avail.Storage	Storage Description			
#1	9.50'	301,305 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
9.50	4	15.0	0	0	4	
10.00	4	15.1	2	2	12	
11.00	387	154.8	143	145	1,902	
12.00	2,182	215.5	1,163	1,308	3,700	
14.00	32,458	1,775.8	28,704	30,012	250,958	
15.00	57,893	1,918.0	44,566	74,578	292,797	
16.00	99,354	2,769.6	77,696	152,274	610,476	
17.50	99,354	2,769.6	149,031	301,305	614,630	

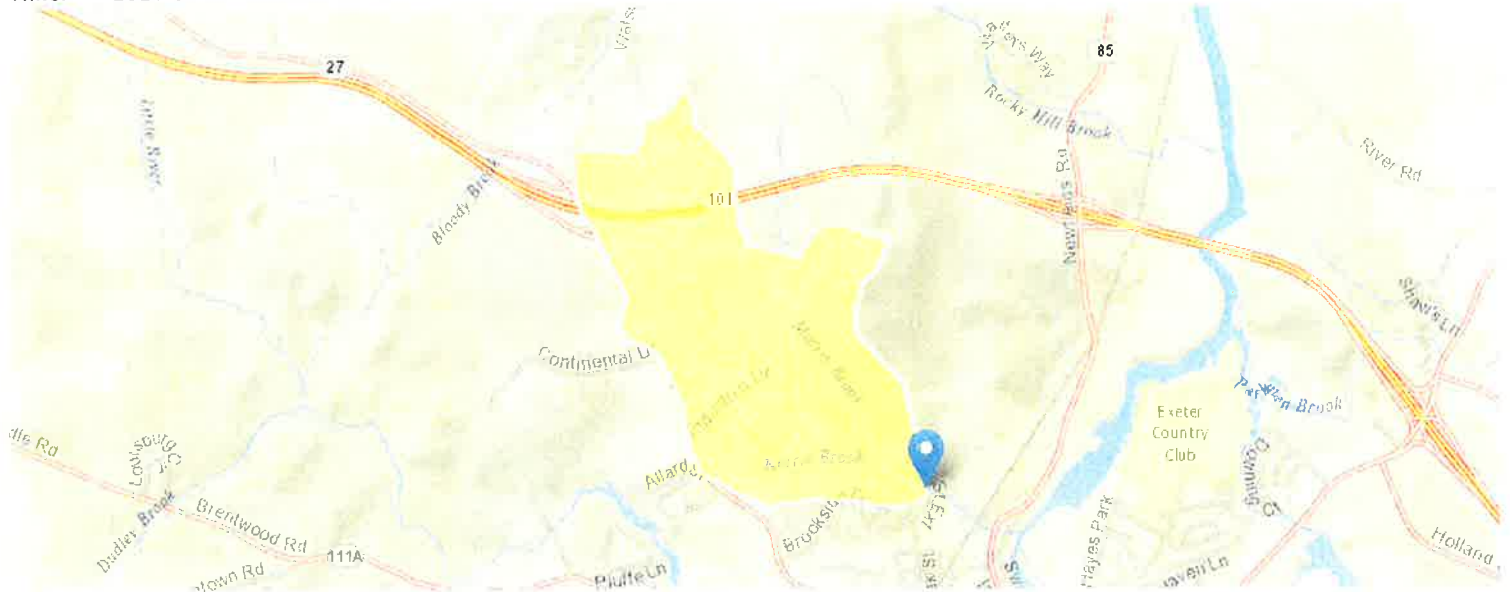
Device	Routing	Invert	Outlet Devices
#1	Primary	11.30'	<b>48.0" W x 36.0" H Box Box Culvert 48x36 w/ 12.0" inside fill</b> L= 40.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 10.30' / 9.90' S= 0.0100 ' / Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 8.00 sf
#2	Secondary	16.10'	<b>50.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=91.92 cfs @ 6.02 hrs HW=16.79' TW=13.14' (Dynamic Tailwater)  
 ↳1=Box Culvert 48x36 (Inlet Controls 91.92 cfs @ 11.49 fps)

**Secondary OutFlow** Max=77.08 cfs @ 6.15 hrs HW=16.79' TW=13.14' (Dynamic Tailwater)  
 ↳2=Broad-Crested Rectangular Weir (Weir Controls 77.08 cfs @ 2.22 fps)

# StreamStats Report

Region ID: NH  
 Workspace ID: NH20210525144620617000  
 Clicked Point (Latitude, Longitude): 42.98950, -70.95608  
 Time: 2021-05-25 10:46:38 -0400



## Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.69	square miles
APRAVPRE	Mean April Precipitation	4.241	inches
WETLAND	Percentage of Wetlands	2.7348	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	53.7	feet per mi

## Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.69	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	4.241	inches	2.79	6.23
WETLAND	Percent Wetlands	2.7348	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	53.7	feet per mi	5.43	543

## Peak-Flow Statistics Disclaimers [Peak Flow Statewide SIR2008 5206]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

## Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

Statistic	Value	Unit
50-percent AEP flood	30.9	ft <sup>3</sup> /s

<b>Statistic</b>	<b>Value</b>	<b>Unit</b>
20-percent AEP flood	55.3	ft <sup>3</sup> /s
10-percent AEP flood	77.2	ft <sup>3</sup> /s
4-percent AEP flood	109	ft <sup>3</sup> /s
2-percent AEP flood	136	ft <sup>3</sup> /s
1-percent AEP flood	169	ft <sup>3</sup> /s
0.2-percent AEP flood	257	ft <sup>3</sup> /s

*Peak-Flow Statistics Citations*

**Olson, S.A., 2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S. Geological Survey Scientific Investigations Report 2008-5206, 57 p. (<http://pubs.usgs.gov/sir/2008/5206/>)**

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Application Version: 4.5.3

StreamStats Services Version: 1.2.22

NSS Services Version: 2.1.2





# WETLANDS PERMIT APPLICATION STREAM CROSSING WORKSHEET

Water Division/Land Resources Management  
Wetlands Bureau



RSA/Rule RSA 482-A/ Env-Wt-900

This worksheet can be used to accompany Wetlands Permit Applications when proposing stream crossings.

### SECTION 1 - TIER CLASSIFICATIONS

Determine the contributing watershed size at [USGS StreamStats](#).

Note: Plans for tier 2 and 3 crossings shall be designed and stamped by a professional engineer who is licensed under RSA 310-A to practice in New Hampshire.

Size of contributing watershed at the crossing location: 89 acres

- Tier 1:** A tier 1 stream crossing is a crossing located on a watercourse where the contributing watershed size is less than or equal to 200 acres.
- Tier 2:** A tier 2 stream crossing is a crossing located on a watercourse where the contributing watershed size is greater than 200 acres and less than 640 acres.
- Tier 3:** A tier 3 stream crossing is a crossing that meets **any** of the following criteria:
  - On a watercourse where the contributing watershed is more than 640 acres.
  - Within a [designated river corridor](#) unless:
    - a. The crossing would be a tier 1 stream based on contributing watershed size, or
    - b. The structure does not create a direct surface water connection to the designated river as depicted on the national hydrography dataset as found on GRANIT.
  - Within a [100-year floodplain](#) (see Section 2 below).
  - In a jurisdictional area having any protected species or habitat ([NHB DataCheck](#)).
  - In a prime wetland or within a duly-established 100-foot buffer, unless a waiver has been granted pursuant to RSA 482-A:11, IV(b) and Env-Wt 706. Review the [Wetlands Permit Planning Tool \(WPPT\)](#) for town prime wetland and prime wetland buffer maps to determine if your project is within these areas.
- Tier 4:** A tier 4 stream crossing is a crossing located on a tidal watercourse.

### SECTION 2 - 100-YEAR FLOODPLAIN

Use the [FEMA Map Service Center](#) to determine if the crossing is located within a 100-year floodplain. Please answer the questions below:

- No:** The proposed stream crossing *is not* within the FEMA 100-year floodplain.
- Yes:** The proposed project *is* within the FEMA 100-year floodplain. Zone =  
Elevation of the 100-year floodplain at the inlet:                      feet (FEMA El. or Modeled El.)

### SECTION 3 - CALCULATING PEAK DISCHARGE

Existing 100-year peak discharge (Q) calculated in cubic feet per second (CFS): 49.9 CFS	Calculation method: Stream Stats
Estimated bankfull discharge at the crossing location: 49.7 CFS	Calculation method: Inlet Control

[irm@des.nh.gov](mailto: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](http://www.des.nh.gov)

➔ **Note: If tier 1, then skip to Section 10** ➔

**SECTION 4 - PREDICTED CHANNEL GEOMETRY BASED ON REGIONAL HYDRAULIC CURVES**

*For tier 2, tier 3 and tier 4 crossings only.*

Bankfull Width: 2 feet      Mean Bankfull Depth: 2 feet

Bankfull Cross Sectional Area: 3.14 square feet (SF)

**SECTION 5 - CROSS SECTIONAL CHANNEL GEOMETRY: MEASUREMENTS OF THE EXISTING STREAM WITHIN A REFERENCE REACH**

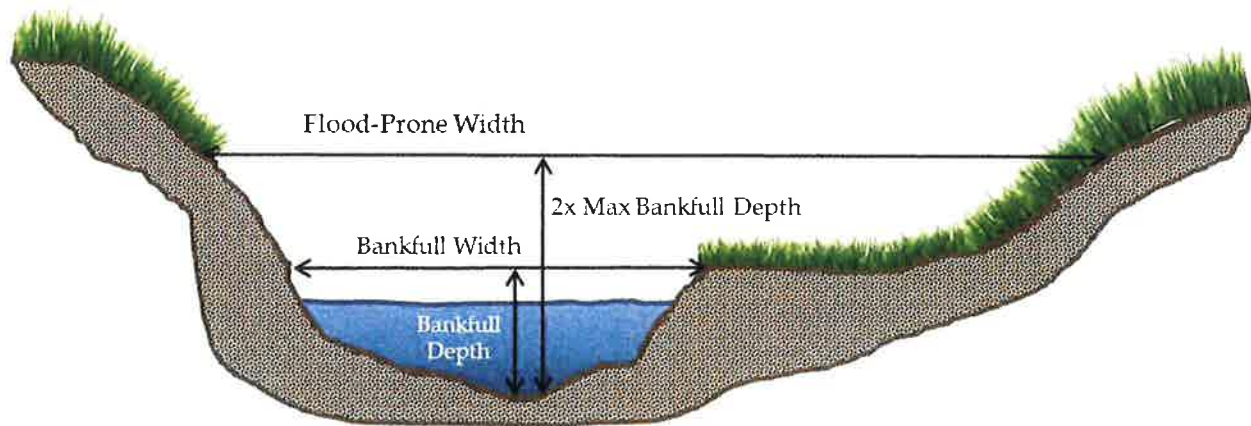
*For tier 2, tier 3 and tier 4 crossings only.*

Describe the reference reach location: 200 feet upstream to 100 feet down stream

Reference reach watershed size: 89 acres

Parameter	Cross Section 1 Describe bed form 200' Upstream <i>(e.g. pool, riffle, glide)</i>	Cross Section 2 Describe bed form 100' Upstream <i>(e.g. pool, riffle, glide)</i>	Cross Section 3 Describe bed form 100' Downstream <i>(e.g. pool, riffle, glide)</i>	Range
Bankfull Width	10.4 feet	5.6 feet	15.2 feet	5.6-15.2 feet
Bankfull Cross Sectional Area	3.4 SF	1.5 SF	8.5 SF	1.5-8.5 SF
Mean Bankfull Depth	0.6 feet	0.6 feet	1.0 feet	0.6-1.0 feet
Width to Depth Ratio	17.6	9.8	15.2	9.8-17.6
Max Bankfull Depth	1.2 feet	1.1 feet	2.0 feet	1.1-2.0 feet
Flood Prone Width	18.4 feet	96.7 feet	109.4 feet	18.4-109.4 feet
Entrenchment Ratio	1.8	17.3	7.2	1.8-17.2

Use **Figure 1** below to determine the measurements of the Reference Reach Attributes



**Figure 1:** Determining the Reference Reach Attributes.

**SECTION 6 - LONGITUDINAL PARAMETERS OF THE REFERENCE REACH AND CROSSING LOCATION**

*For tier 2, tier 3 and tier 4 crossings only.*

Average Channel Slope of the Reference Reach: 0.015 ft/ft

Average Channel Slope at the Crossing Location: 0.018 ft/ft

**SECTION 7 - PLAN VIEW GEOMETRY**

Note: Sinuosity is measured a distance of at least 20 times bankfull width, or 2 meander belt widths.

*For tier 2, tier 3 and tier 4 crossings only.*

Sinuosity of the Reference Reach: NA	
Sinuosity of the Crossing Location: NA	
<b>SECTION 8 - SUBSTRATE CLASSIFICATION BASED ON FIELD OBSERVATIONS</b>	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
% of reach that is bedrock:	0 %
% of reach that is boulder:	0 %
% of reach that is cobble:	0 %
% of reach that is gravel:	0 %
% of reach that is sand:	20 (due to erosion) %
% of reach that is silt:	80 %
<b>SECTION 9 - STREAM TYPE OF REFERENCE REACH</b>	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
Stream Type of Reference Reach:	E

Refer to Rosgen Classification Chart (Figure 2) below:

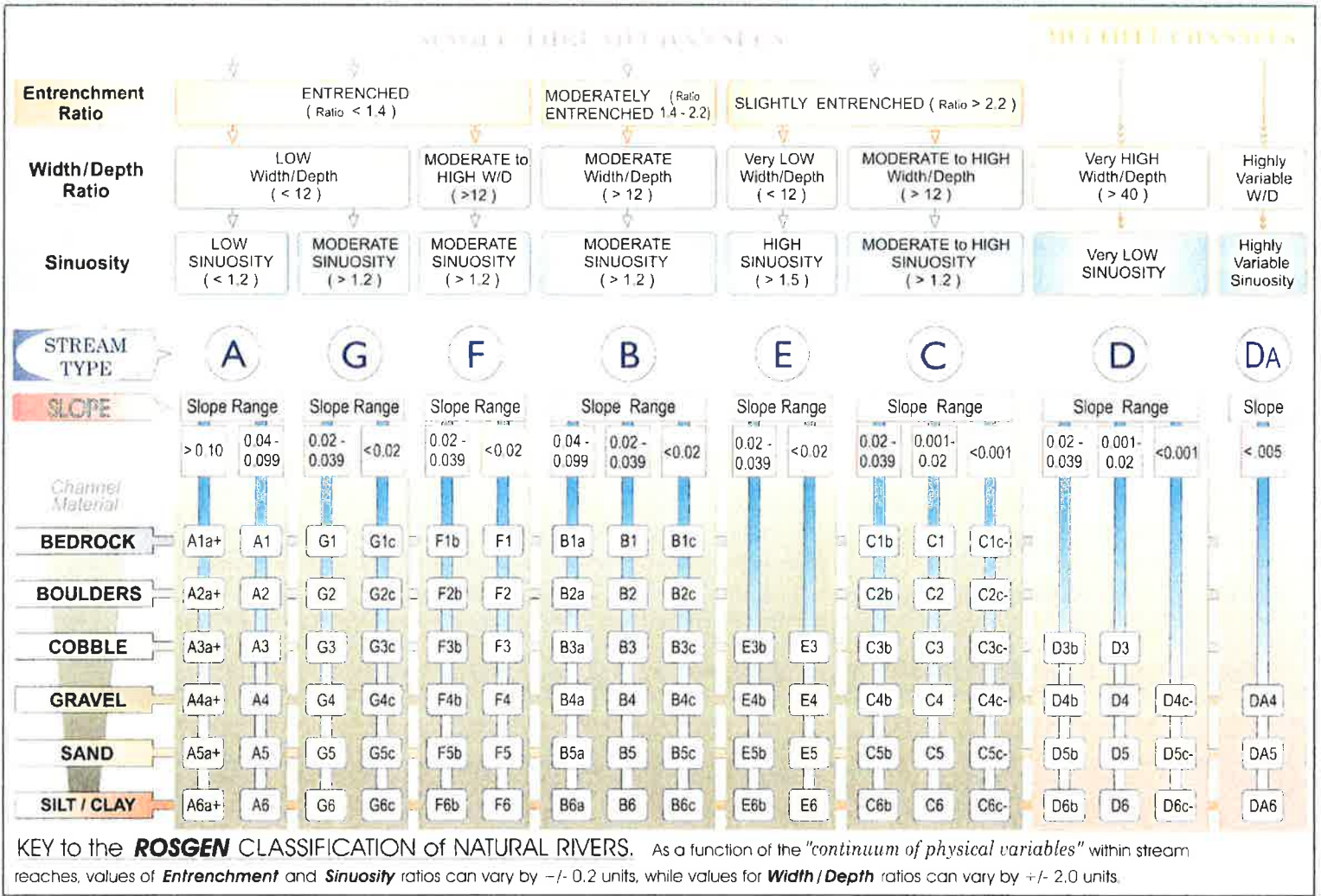


Figure 2: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 10 - CROSSING STRUCTURE METRICS						
Existing Conditions	Existing Structure Type:		<input type="checkbox"/> Bridge span <input type="checkbox"/> Pipe arch <input type="checkbox"/> Open-bottom culvert <input type="checkbox"/> Closed-bottom culvert <input type="checkbox"/> Closed-bottom culvert with stream simulation <input checked="" type="checkbox"/> Other: 24" RCP Culvert			
	Existing Crossing Span: (perpendicular to flow)		feet	Culvert Diameter: 2 feet Inlet Elevation: El. 19.21 feet		
	Existing Crossing Length: (parallel to flow)		37 feet	Outlet Elevation: El. 18.52 feet Culvert Slope: 0.02		
Proposed Conditions	Proposed Structure Type:		Tier 1	Tier 2	Tier 3	Alternative Design
	Bridge Span		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Pipe Arch		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Closed-bottom Culvert		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Open-bottom Culvert		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Closed-bottom Culvert with stream simulation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proposed Structure Span:		2 feet	Culvert Diameter: 2 feet			

(perpendicular to flow)	Inlet Elevation: El. 19.2 feet
Proposed Structure Length: 37 feet (parallel to flow)	Outlet Elevation: El. 18.5 feet Culvert Slope: 0.18
Proposed Entrenchment Ratio:* 48.3 For Tier 2, Tier 3 and Tier 4 Crossings Only. To accommodate the entrenchment ratio, floodplain drainage structures may be utilized.	

\* Note: Proposed Entrenchment Ratio must meet the minimum ratio for each stream type listed in Figure 3, otherwise the applicant must address the Alternative Design criteria listed in Env-Wt 904.10.

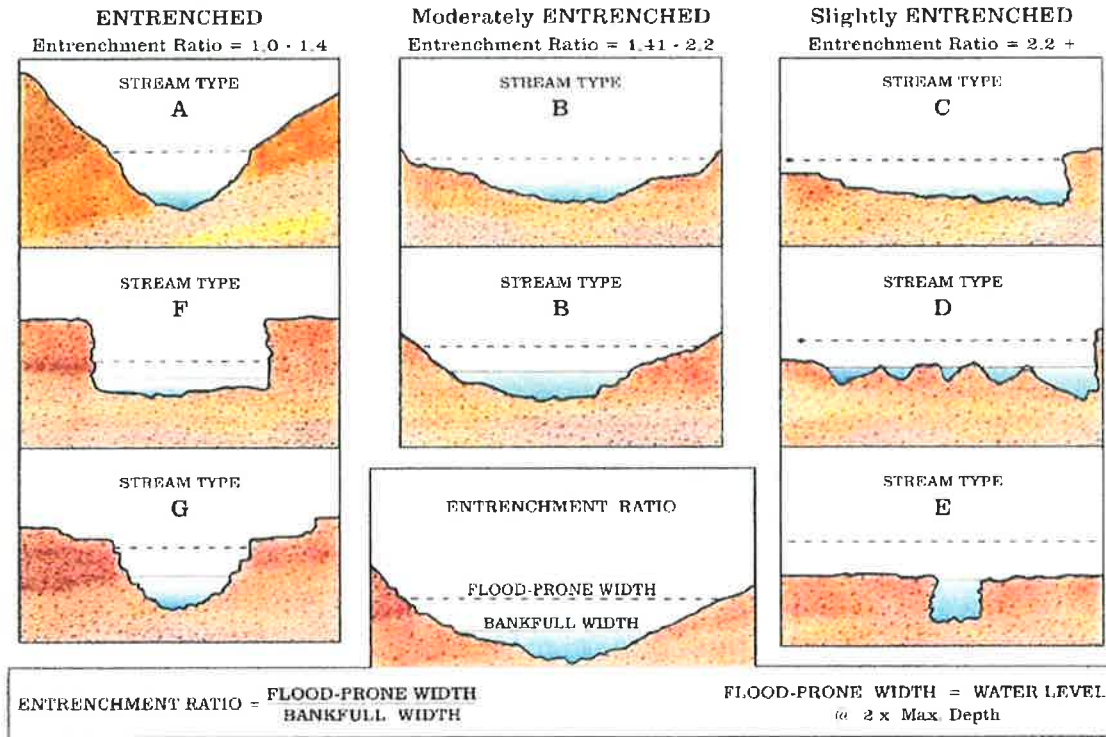


Figure 3: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 11 - CROSSING STRUCTURE HYDRAULICS		
	Existing	Proposed
100 year flood stage elevation at inlet:	27.11	27.11
Flow velocity at outlet in feet per second (FPS):	12.48	12.48
Calculated 100 year peak discharge (Q) for the proposed structure in CFS:		79.7
Calculated 50 year peak discharge (Q) for the proposed structure in CFS:		39.2
SECTION 12 - CROSSING STRUCTURE OPENNESS RATIO		
For tier 2, tier 3 and tier 4 crossings only.		
Crossing Structure Openness Ratio* = 0.085		
* Openness box culvert = (height x width)/length		
Openness round culvert = (3.14 x radius <sup>2</sup> )/length		

### SECTION 13 - GENERAL DESIGN CONSIDERATIONS

Env-Wt 904.01 requires all stream crossings to be designed and constructed according to the following requirements. Check each box if the project meets these general design considerations.

All stream crossings shall be designed and constructed so as to:

- Not be a barrier to sediment transport.
- Prevent the restriction of high flows and maintain existing low flows.
- Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.
- Not cause an increase in the frequency of flooding or overtopping of banks.
- Maintain or enhance geomorphic compatibility by:
  - a. Minimizing the potential for inlet obstruction by sediment, wood, or debris, and
  - b. Preserving the natural alignment of the stream channel.
- Preserve watercourse connectivity where it currently exists.
- Restore watercourse connectivity where:
  - a. Connectivity previously was disrupted as a result of human activity(ies), and
  - b. Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both.
- Not cause erosion, aggradation, or scouring upstream or downstream of the crossing.
- Not cause water quality degradation.

### SECTION 14 - TIER-SPECIFIC DESIGN CRITERIA

Stream crossings must be designed in accordance with the tier specific design criteria listed in Part Env-Wt 904.

- The proposed project meets the tier specific design criteria listed in Part Env-Wt 904 and each requirement has been addressed in the plans and as part of the wetland application.

### SECTION 15 - ALTERNATIVE DESIGN

**NOTE:** If the proposed crossing does not meet all of the general design considerations, the tier specific design criteria, or the minimum entrenchment ratio for each given stream type listed in **Figure 3**, then an alternative design plan and associated requirements must be addressed pursuant to Env-Wt 904.10.

- I have submitted an alternative design and addressed each requirement listed in Env-Wt 904.10.

**47175-00\_Stream-Cross\_Norris Brook-Pre\_2021-05-27**

Storm depth is zero

Prepared by {enter your company name here}

Printed 6/1/2021

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Page 1

**Summary for Pond EC5-050: 50-Year**

Inflow = 39.20 cfs @ 0.00 hrs, Volume= 3,388,291 cf, Incl. 39.20 cfs Base Flow  
 Outflow = 39.20 cfs @ 24.00 hrs, Volume= 3,345,584 cf, Atten= 0%, Lag= 1,440.0 min  
 Primary = 39.20 cfs @ 24.00 hrs, Volume= 3,345,584 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 24.51' @ 24.00 hrs Surf.Area= 16,928 sf Storage= 42,708 cf

Plug-Flow detention time= 17.7 min calculated for 3,345,202 cf (99% of inflow)  
 Center-of-Mass det. time= 8.5 min ( 728.5 - 720.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	19.20'	93,356 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.20	4	4.0	0	0	4
20.00	103	79.6	34	34	508
21.00	502	159.1	277	311	2,023
22.00	9,253	579.6	3,970	4,281	26,744
23.00	16,928	651.0	12,899	17,180	33,763
27.50	16,928	651.0	76,176	93,356	36,693

Device	Routing	Invert	Outlet Devices
#1	Primary	19.21'	<b>24.0" Round Culvert</b> L= 37.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 19.21' / 15.52' S= 0.0997 ' / Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	27.10'	<b>50.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=39.20 cfs @ 24.00 hrs HW=24.51' TW=0.00' (Dynamic Tailwater)  
 ←1=Culvert (Inlet Controls 39.20 cfs @ 12.48 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=21.10' TW=0.00' (Dynamic Tailwater)  
 ←2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Summary for Pond EC5-100: 100-Year**

Inflow = 49.90 cfs @ 0.00 hrs, Volume= 4,313,156 cf, Incl. 49.90 cfs Base Flow  
 Outflow = 49.90 cfs @ 10.23 hrs, Volume= 4,226,337 cf, Atten= 0%, Lag= 613.8 min  
 Primary = 49.68 cfs @ 10.22 hrs, Volume= 4,211,840 cf  
 Secondary = 0.22 cfs @ 10.23 hrs, Volume= 14,497 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 27.11' @ 10.20 hrs Surf.Area= 16,928 sf Storage= 86,819 cf

Plug-Flow detention time= 28.1 min calculated for 4,225,776 cf (98% of inflow)

**47175-00\_Stream-Cross\_Norris Brook-Pre\_2021-05-27**

Storm depth is zero

Prepared by {enter your company name here}

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Page 2

Center-of-Mass det. time= 13.5 min ( 733.5 - 720.0 )

Volume	Invert	Avail.Storage	Storage Description			
#1	19.20'	93,356 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
19.20	4	4.0	0	0	4	
20.00	103	79.6	34	34	508	
21.00	502	159.1	277	311	2,023	
22.00	9,253	579.6	3,970	4,281	26,744	
23.00	16,928	651.0	12,899	17,180	33,763	
27.50	16,928	651.0	76,176	93,356	36,693	

Device	Routing	Invert	Outlet Devices
#1	Primary	19.21'	<b>24.0" Round Culvert</b> L= 37.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 19.21' / 18.52' S= 0.0186 '/ Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	27.10'	<b>50.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=49.68 cfs @ 10.22 hrs HW=27.11' TW=0.00' (Dynamic Tailwater)↳ **1=Culvert** (Inlet Controls 49.68 cfs @ 15.81 fps)**Secondary OutFlow** Max=0.22 cfs @ 10.23 hrs HW=27.11' TW=0.00' (Dynamic Tailwater)↳ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.22 cfs @ 0.32 fps)



**47175-00\_Stream-Cross\_Norris Brook-Post\_2021-05-27**

Storm depth is zero

Prepared by {enter your company name here}

Printed 6/1/2021

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**Summary for Pond PC5-050: 50-Year**

Inflow = 39.20 cfs @ 0.00 hrs, Volume= 3,388,291 cf, Incl. 39.20 cfs Base Flow  
 Outflow = 39.20 cfs @ 24.00 hrs, Volume= 3,345,584 cf, Atten= 0%, Lag= 1,440.0 min  
 Primary = 39.20 cfs @ 24.00 hrs, Volume= 3,345,584 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 24.51' @ 24.00 hrs Surf.Area= 16,928 sf Storage= 42,708 cf

Plug-Flow detention time= 17.7 min calculated for 3,345,202 cf (99% of inflow)  
 Center-of-Mass det. time= 8.5 min ( 728.5 - 720.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	19.20'	93,356 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.20	4	4.0	0	0	4
20.00	103	79.6	34	34	508
21.00	502	159.1	277	311	2,023
22.00	9,253	579.6	3,970	4,281	26,744
23.00	16,928	651.0	12,899	17,180	33,763
27.50	16,928	651.0	76,176	93,356	36,693

Device	Routing	Invert	Outlet Devices
#1	Primary	19.21'	<b>24.0" Round Culvert</b> L= 37.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 19.21' / 15.52' S= 0.0997 ' S= 0.0997 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	27.10'	<b>50.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=39.20 cfs @ 24.00 hrs HW=24.51' TW=0.00' (Dynamic Tailwater)

←1=Culvert (Inlet Controls 39.20 cfs @ 12.48 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=21.10' TW=0.00' (Dynamic Tailwater)

←2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Summary for Pond PC5-100: 100-Year**

Inflow = 49.90 cfs @ 0.00 hrs, Volume= 4,313,156 cf, Incl. 49.90 cfs Base Flow  
 Outflow = 49.90 cfs @ 10.23 hrs, Volume= 4,226,337 cf, Atten= 0%, Lag= 613.8 min  
 Primary = 49.68 cfs @ 10.22 hrs, Volume= 4,211,840 cf  
 Secondary = 0.22 cfs @ 10.23 hrs, Volume= 14,497 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 27.11' @ 10.20 hrs Surf.Area= 16,928 sf Storage= 86,819 cf

Plug-Flow detention time= 28.1 min calculated for 4,225,776 cf (98% of inflow)

**47175-00\_Stream-Cross\_Norris Brook-Post\_2021-05-27**

Storm depth is zero

Prepared by {enter your company name here}

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Center-of-Mass det. time= 13.5 min ( 733.5 - 720.0 )

Volume	Invert	Avail.Storage	Storage Description		
#1	19.20'	93,356 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.20	4	4.0	0	0	4
20.00	103	79.6	34	34	508
21.00	502	159.1	277	311	2,023
22.00	9,253	579.6	3,970	4,281	26,744
23.00	16,928	651.0	12,899	17,180	33,763
27.50	16,928	651.0	76,176	93,356	36,693

Device	Routing	Invert	Outlet Devices
#1	Primary	19.21'	<b>24.0" Round Culvert</b> L= 37.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 19.21' / 18.52' S= 0.0186 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
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**Primary OutFlow** Max=49.68 cfs @ 10.22 hrs HW=27.11' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 49.68 cfs @ 15.81 fps)**Secondary OutFlow** Max=0.22 cfs @ 10.23 hrs HW=27.11' TW=0.00' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.22 cfs @ 0.32 fps)

# StreamStats Report

**Region ID:** NH  
**Workspace ID:** NH20210525222338339000  
**Clicked Point (Latitude, Longitude):** 42.98793, -70.95707  
**Time:** 2021-05-25 18:23:55 -0400



## Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.14	square miles
APRAVPRE	Mean April Precipitation	4.249	inches
WETLAND	Percentage of Wetlands	0	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	53.1	feet per mi

## Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.14	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	4.249	inches	2.79	6.23
WETLAND	Percent Wetlands	0	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	53.1	feet per mi	5.43	543

## Peak-Flow Statistics Disclaimers [Peak Flow Statewide SIR2008 5206]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

## Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

Statistic	Value	Unit
50-percent AEP flood	7.82	ft <sup>3</sup> /s

<b>Statistic</b>	<b>Value</b>	<b>Unit</b>
20-percent AEP flood	14.7	ft <sup>3</sup> /s
10-percent AEP flood	21.1	ft <sup>3</sup> /s
4-percent AEP flood	30.7	ft <sup>3</sup> /s
2-percent AEP flood	39.2	ft <sup>3</sup> /s
1-percent AEP flood	49.9	ft <sup>3</sup> /s
0.2-percent AEP flood	79.1	ft <sup>3</sup> /s

*Peak-Flow Statistics Citations*

**Olson, S.A., 2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S. Geological Survey Scientific Investigations Report 2008-5206, 57 p. (<http://pubs.usgs.gov/sir/2008/5206/>)**

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Application Version: 4.5.3

StreamStats Services Version: 1.2.22

NSS Services Version: 2.1.2

# **Wetland Functional Evaluation**

Of

**Exeter Rose Farm, LLC  
Assessors Tax Map 54 / Lots 5-7 and Tax Map 63 / Lot 205  
Oak Street Extension  
Exeter, NH**

Prepared for

Exeter Rose Farm, LLC  
953 Islington Street, Suite 23D  
Portsmouth, NH 03801

By

Marc E. Jacobs  
Certified Wetland & Soil Scientist  
P.O. Box 417  
Greenland, NH 03840-0417

April 3, 2018

## **EXETER ROSE FARM, LLC**

### **Wetland Functional Evaluation**

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- Photographs and Descriptions
- Exhibit 1- USGS Topographic Map/Locus
- Exhibit 2 – Map of Wetland Study Areas
- Natural Heritage Bureau Report
- Completed Wetland Function/Value Evaluation Forms
- Highway Methodology Workbook Supplement - Appendix A

**Wetland Functional Evaluation  
Exeter Rose Farm, LLC  
Oak Street Extension  
Exeter, NH**

## **1.0 Introduction**

Pursuant to the request by the Exeter Rose Farm, LLC to the Town of Exeter, New Hampshire for subdivision approval involving work within wetlands and, more specifically, the Wetland Conservation District (Zoning Article 9 - §9.1.6.C) at the above-referenced location off of Oak Street Extension in Exeter, NH, specifically Assessors Map 54 – Lots 5-7 and Map 63 – Lot 205, we herewith submit this Wetland Functional Evaluation to supplement the application as required under Town of Exeter, New Hampshire – Site & Subdivision Regulations – Section 9.9.3.2.

This report provides an assessment of the existing wetland functions and values at this location according to the United States Army Corps of Engineers - New England District, Highway Methodology Workbook *Supplement* – September 1999 Edition (updated in 2015). This study does not attempt to evaluate the potential effects of global climate change and associated sea level rise or tidal surge on the functions and values of wetlands at the subject properties. This evaluation may use the terms subject properties and subject property interchangeably.

This evaluation assesses the functions and values listed below for primary wetland areas based upon the current condition, noting that the site is partially developed. The functions and values of a wetland or adjacent wetlands may be altered, or more specifically, the effectiveness of a wetland or adjacent wetlands to provide a particular function may be altered (increased or decreased) as a result of modifications to adjacent uplands, impacts to wetlands elsewhere on site or other development in the watershed.

Attached is a copy of a composite 7.5 X 15 Minute United States Geological Survey Quadrangle(s) on which is depicted the approximate location of the subject property. Digital images and associated descriptions are also attached to this report. Refer to Exhibit 1.

## **2.0 Existing Conditions**

### **2.1 General Property Description**

The site is bounded to the east by active railroad tracks, to the north by the Henderson-Swasey Town Forest belonging to the Town of Exeter, to the west by developed industrial lands (Industrial Drive and Commerce Way) as well as Norris Brook Condominiums and to the south by densely developed residential neighborhoods of single-family homes. A large gas main bisects the western tip of the property.

Exeter Rose Farm, LLC  
Exeter, NH  
April 3, 2018

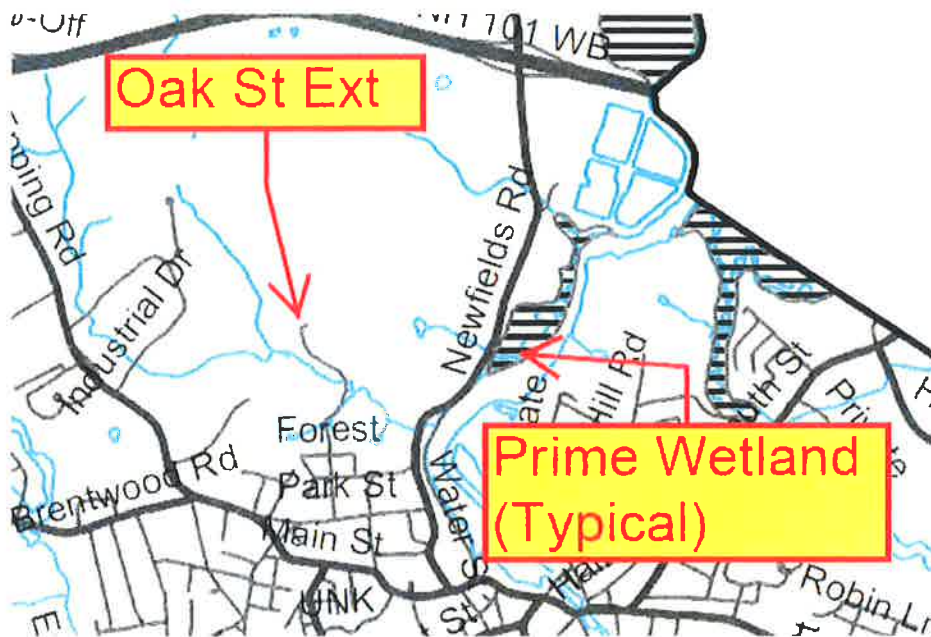
Historic land uses at this location included a brick yard and later, rose growing greenhouses and packing facilities as well as residential housing. Significant portions of the site, including wetlands, have been altered and some areas are contaminated with lead, coal ash and solid waste associated with the prior land uses. Numerous man-made wetlands and retention ponds exist as a result of excavation and other earth moving activities. The man-made retention pond located east of and adjacent to Oak Street Extension, between the spring house and the pump house described below, was created by excavation and impoundment. The impoundment consists of a poured concrete structure installed across Norris Brook. The concrete structure has been partially breached due to erosion at the south end. The dredge spoils from pond excavation are stockpiled on the south side of the pond in what were likely wetlands before they were filled. The retention pond contains a large plume of sediment from upstream. It does not appear that this pond was used for irrigation. The man-made retention ponds located north of Oak Street Extension captured runoff from the greenhouses. The runoff collected in the largest retention pond was then reused for irrigation. The hydrant along Oak Street Extension indicates that this retention pond also serves as fire protection.

The property is partially developed with 9 existing residential dwellings (5 of which are currently occupied) and several garages / outbuildings that are accessed by Oak Street Extension, which is in significant disrepair. The concrete structure that formerly housed the rose packing operation and possibly the heating system also remains. Areas of the property that formerly housed the greenhouse operations are now generally vegetated with fields that have a shrub / sapling component dominated by black locust (*Robinia pseudoacacia*). When the greenhouses were dismantled the concrete slabs were bulldozed and partially buried / exposed remnants of the concrete slabs as well as piping and other materials can be seen throughout the area and remain a significant hazard to pedestrians, especially when occasional subsurface cavities are encountered. Remaining areas of the property are generally forested with a mix of softwood and hardwood tree species dominated by oak, pine and maple. Norris Brook, a perennial stream, runs along and through portions of the property. Another unnamed perennial stream (according to some sources) and two unnamed intermittent streams as well as numerous groundwater seeps (owing to surficial geology and site soils) also drain the property and all are tributary to Norris Brook within the confines of the site. Norris Brook eventually drains to the Squamscott River, which is tidally influenced at this juncture. The influence of the normal tidal cycle does not extend to the subject properties. Most streams within the property sustain associated wetlands. There are numerous mountain bicycle trails throughout the property. A gas line/easement, 35-feet in width, traverses the western tip of the property along Norris Brook. There is a spring house on the property, along Oak Street Extension, near Forest Street, which is visited frequently by residents of the town. Water is provided to the existing homes on the subject property from the spring via a pump house (which is located adjacent to Oak Street Extension, between Oak Street Extension and aforementioned impoundment / pond). The existing homes are served by individual sewage disposal systems of unknown origin and status.

There are no prime wetlands on or immediately adjacent to the subject property. Prime wetlands are those wetlands with higher functions and values and receive additional protection under state law. Exeter has municipally designated prime wetlands recognized by NHDES. Refer to Figure 1 below.



**Figure 1. Prime Wetlands (NHDES Web Site)**



## 2.2 General Project Description

The project proposes an open space development with construction of 3,788± linear feet of new roadway, servicing approximately 37 new single-family homes. The proposed project will be serviced by municipal water and sewer utilities. Portions of the site which are contaminated with lead, coal ash and solid waste are proposed to be remediated during development. The project proposes to relocate the existing trail that traverses the western end of the property. The project is also proposing 23± acres of open space (approximately 46 percent of the property) as well as a neighborhood recreation area. The project will be covered by a Home Owners Association (HOA), which will be responsible for management of the open space and spring in perpetuity.

## 2.3 Study Area Determination

Determination of suitable study areas can be somewhat subjective depending upon what criteria are used to define the study area, especially since wetlands are natural systems and do not recognize political boundaries such as property lines and because all wetland systems have variations in physical attributes within a seemingly discreet wetland area.

For this study we distinguished four study areas with an emphasis on hydrology and, to a lesser degree, flooding. Highway Methodology Wetland Function-Value Forms were completed for each of the four study areas and copies of the completed forms are attached. Refer to the attached map (Exhibit 2) for a graphic representation of the lateral extent of the four study areas.

Wetlands associated with Norris Brook upstream and downstream of Oak Street Extension were separated. They were apparently part of the same wetland system prior to the construction of Oak Street Extension. The fill placed to construct Oak Street Extension, especially when considered

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with the culvert at Oak Street Extension, create a logical break. Norris Brook is a perennial stream which flows west to east. Wetlands associated with Norris Brook located upstream (west) of Oak Street Extension are shaded in blue while wetlands adjacent to Norris Brook located downstream (east) of Oak Street Extension are shaded in green on Exhibit 2. Wetlands associated with the unnamed perennial stream were combined with the downstream section of wetlands associated with Norris Brook and are also shaded in green. The two primary intermittent streams that drain to Norris Brook were also evaluated separately. Wetlands associated with the western intermittent stream, which is proposed to be crossed by a cul-de-sac, are shaded in yellow while wetlands associated with the eastern intermittent stream are shaded in red on Exhibit 1.

Wetlands adjacent to Norris Brook are sustained by periodic overbank flooding supplemented by significant groundwater inputs, with lesser inputs from sheet / overland flow and finally direct precipitation. Numerous groundwater seeps can be observed around the Norris Brook drainage area and we have noted two of the more significant seeps on Exhibit 2.

The subject property includes numerous isolated wetlands that were not included in the evaluation. These isolated wetlands are man-made, both intentionally for purposes such as irrigation and incidentally during removal of the greenhouse facilities. Several of the isolated wetlands are contaminated with hazardous materials, as are adjacent uplands, and as such are proposed to be altered or eliminated during remediation of these contaminated areas.

## **2.4 Wetland Study Area Descriptions**

### Western Intermittent Stream (Yellow) Study Area

Wetlands associated with the western intermittent stream are depicted in yellow shading on Exhibit 2. The stream has origins in largely forested areas located north of the subject property and the gas pipeline. The gas pipeline includes a gravel access road which concentrates and conveys the stream through a high-density polyethylene (HDPE) corrugated plastic culvert at the property line with the subject. The culvert is perched at this location. The stream flows through a forested area with a dense canopy dominated by coniferous trees (White pine) and poorly drained hydric soils which are dominated by marine sediments having silt and clay textures. The stream and wetlands are the same in many locations although there are patches of adjacent wetlands, especially where supplemental hydrology provided by groundwater exists. The groundwater inputs are not as strong as those along Norris Brook due to the adjacent upland soil types which are dominated by loamy glacial till parent materials. There are patches of scrub-shrub wetlands associated with the groundwater influenced areas, otherwise the dominant wetland classification according to the National Wetland Inventory (NWI) and Cowardin system is Riverine, Intermittent, Unconsolidated Bottom, Intermittently Flooded (R4UBJ). The NWI has identified this stream as perennial however we have observed the stream in a no-flow condition during non-drought conditions. The relatively small watershed for this stream also contradicts a conclusion that the flow is perennial.

### Norris Brook – Upstream (Blue) Study Area

Wetlands associated with Norris Brook located upstream (west) of Oak Street Extension are depicted in blue shading on Exhibit 2 and generally involve palustrine forested and scrub-shrub vegetation cover types. Watson Brook is tributary to Norris Brook at the west end of this study area as is the western intermittent stream described above.

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Exeter, NH  
April 3, 2018

The wetlands and Norris Brook are confined by steep slopes in this area. The steep slopes on the north (south facing) side are adjacent to Oak Street Extension and the former greenhouse packing and heating facilities. Much of the length of the north slope starting near the man-made retention basin at the base of the slope behind the former packing house and Oak Street Extension has been filled and the fill often includes solid waste such as white goods and automobile tires as well as coal ash. Groundwater seeps can be observed emanating from these waste materials in some locations. The fill appears to have been pushed over an existing bank in many places and is nestled amongst large trees in numerous locations. Indeed, the largest tree observed on site is a 32.5-inch diameter White oak located on the north slope below the former packing house. The north slope is currently forested however as numerous trees have grown back since this fill was placed.

The south slope is forested with a mix of soft and hardwood species that include a significant number of conifers such as hemlock. One groundwater seep on the south slope may be receiving stormwater from adjacent development and appears to be experiencing minor erosion with subsequent sedimentation of the wetland at the toe-of-slope and Norris Brook.

Norris Brook is moderately sinuous in this study area and drains to a 36-inch diameter reinforced concrete pipe (RCP) at Oak Street Extension. The culvert is partially plugged by debris and acts as a constriction to flow. The remains of an earthen berm were observed adjacent to the culvert. The berm resembles an old beaver dam but no associated remains of a beaver lodge have been observed. The berm has been breached. The dominant substrate in the study area involves poorly drained soils derived from marine sediments having silt and clay textures. There are pockets of very poorly drained soils confined within the poorly drained soils and we speculate that their existence and development may be associated with the flooding or impoundment caused by the aforementioned berm or beavers but this is not clear. (Some of the various resource maps we have examined over the last 2 years indicate flooding or ponding in this area.) Braided channels can be observed and indicate occasional overbank flooding.

Water quality of Norris Brook appears to be good. Turbidity is low overall but the intermittent stream and Watson Brook contribute sediment and the stream bottom is unconsolidated and also likely contributes sediment during larger storms. It is not known if the pollutants associated with the portion of the site which is contaminated exist in the stream. Lead is relatively immobile and the solid waste is not likely an issue.

The relatively large lobe of the wetland area shaded in blue that extends north-south and parallel to Oak Street Extension is sustained largely by groundwater with occasional intermittent flow from impervious and slowly pervious surfaces associated with Oak Street Extension and is eventually tributary to Norris Brook. The area is predominantly vegetated with shrubs and saplings and was likely contiguous with wetlands adjacent to the unnamed perennial brook before the construction of Oak Street Extension. The dominant substrate in this area involves poorly drained soils derived from marine sediment parent materials dominated by silt and clay textures. This area does not generally support standing water although it is conceivable that standing water backed up into this area if the berm identified above was ever functional.

Norris Brook – Downstream (Green) Study Area

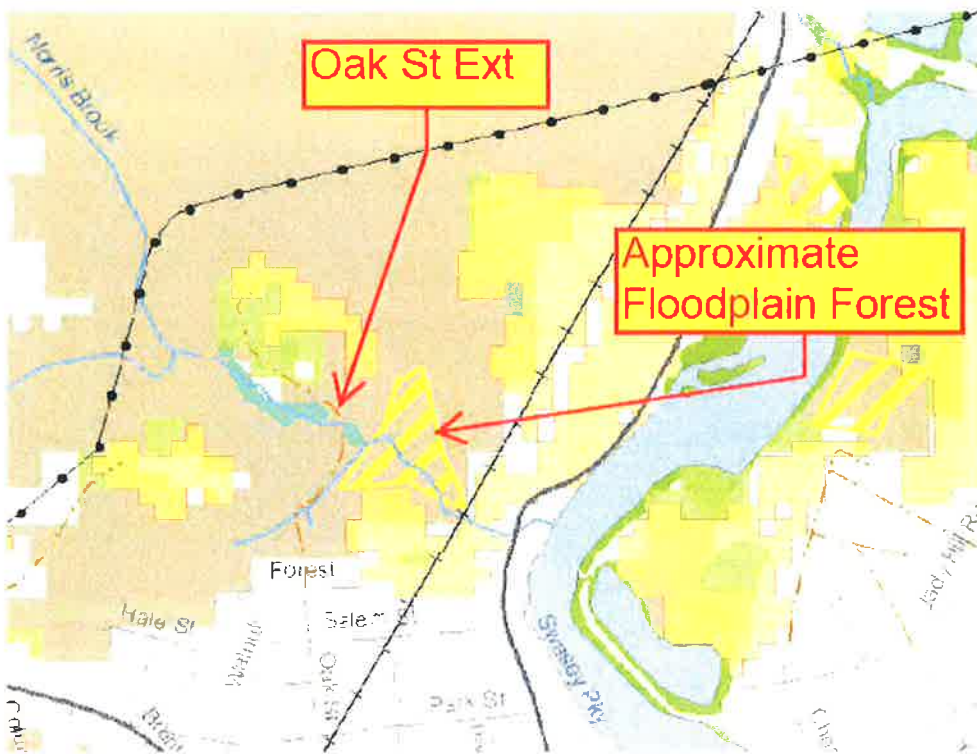
Wetlands located downstream (east) of Oak Street Extension are depicted in green shading on Exhibit 2 and generally involve palustrine forested and scrub-shrub vegetation cover types that are moderately dense to dense in most locations. There is a pond immediately downstream (east) of Oak Street Extension. The pond was created via a combination of excavation and impoundment. The excavation / dredge spoils were stockpiled to the south of the pond in what were likely wetlands. The impoundment is created by a concrete structure which has been partially breached by erosion at the south end. There is a large plume of sediment in the pond, attesting to the significant erosion and sediment transport taking place from Norris Brook, Watson Brook and the intermittent stream located upstream (west) of Oak Street Extension.

The wetlands associated with Norris Brook are confined by steep slopes in this study area, especially toward the east and railroad tracks. The slopes are generally forested with mature mixed hardwood trees with lesser amounts of coniferous softwoods.

Groundwater seeps are apparent and the most significant is located on the slope near the old jailhouse on Forest Street which drains to the unnamed perennial stream that is also tributary to Norris Brook. The slope along the east side of Oak Street Extension, between Oak Street Extension and the unnamed perennial stream, is generally comprised of fill materials and supports a large colony of Japanese knotweed, an invasive species. The channel which confines the unnamed perennial stream, or significant portions thereof, continues to develop in response to the filling of Oak Street Extension and excavation of the pond and deposition of the dredge spoils. The unnamed perennial stream is experiencing erosion in various locations with subsequent turbidity into Norris Brook just below the dam where the unnamed stream enters. Numerous bricks and brick pieces can be observed in the unnamed perennial stream channel near the juncture with Norris Brook. Refer to Images 1 and 2.

Norris Brook is moderately sinuous in this study area and drains to a 56-inch wide by 66-inch tall box culvert comprised by granite blocks/slabs at the downstream (east) property line and railroad tracks. The culvert is partially plugged by debris and may act as a minor constriction to flow based upon observations of obscure staining or siltation on the granite blocks. The dominant substrate in the study area involves poorly drained soils derived from marine sediments having silt and clay textures although significant sandy areas can be found. Braided channels can be observed and indicate occasional overbank flooding. Refer to Figure 2 below from the Natural Resources Inventory prepared for the town in 2011/2012 which indicates the approximate floodplain forest. Keeping the scale of Figure 2 in mind, the floodplain forest coincides reasonably well with the Norris Brook study area shaded in green on Exhibit 1.

**FIGURE 2 Floodplain Forest (Exeter Natural Resource Inventory – Map 2)**



Water quality of Norris Brook appears to be good. Turbidity is low overall but the unnamed perennial stream contributes sediment and the bottom of Norris Brook is unconsolidated and also likely contributes sediment to the stream flow during larger storms.

Eastern Intermittent Stream (Red) Study Area

The wetlands associated with the eastern intermittent stream are shaded in red on Exhibit 2. The stream has origins in largely forested areas located on private property north of the subject property as well as the Henderson-Swasey Town Forest. The watershed (19 Ac) that contributes to this wetland is insufficient to support perennial flow. The wetland has two distinct lobes. The western lobe extends off site and conveys intermittent stream flow. The eastern lobe stays on site and provides sheet flow and groundwater discharge that, due to the small subwatershed, never quite develops channel flow.

The dominant vegetation cover types include forest and scrub-shrub. The dominant substrate involves poorly drained hydric soils derived from marine sediment parent materials having silt and clay textures. Adjacent uplands are generally forested but the forest was previously altered and is regenerating however the area is generally well shaded from thermal impacts, with the possible exception of the shrubby area near the outlet which lacks a dense tree canopy. This study area is generally free from obvious dumping and other similar activities that are common to the upper reaches of the Norris Brook watershed on this property.

The intermittent stream passes through a constriction at its outlet from this study area, where it meets the green study area, owing to a combination of natural and man-made influences. The constriction coincides with an old access road which took advantage of a narrow reach on the wetland created by natural topography. The access road wetland crossing does not appear to have altered the topography substantially although there are a significant number of bricks in the area which would suggest a structure of some sort was installed here previously. Regardless, the stream flow is restricted here, resulting in a small area of shallow ponding immediately upstream and minor moderation of stream flows. However, just below the outlet the constriction results in an increase in flow velocity and turbulence downstream. The increased turbulence has resulted in some scouring and erosion as well as corresponding sedimentation of downstream wetlands in the green study area.

### **3.0 Wetland Functions and Values**

Wetland functions are self-sustaining properties and physical attributes of wetlands that exist without regard to subjective human values. Wetland values are benefits derived from these functions and physical attributes. The functions assessed by the US Army Corps of Engineers Highway Methodology are identified below with a brief explanation of what each function and value considers.

#### **3.1 Functions**

Groundwater Recharge/Discharge – The potential for a wetland to recharge water to an aquifer or discharge groundwater to the surface.

Floodflow Alteration (Storage & Desynchronization) – The potential for a wetland to reduce flood damage by attenuating floodwaters through storage and desynchronization.

Fish/Shellfish Habitat – The potential for waterbodies associated with wetlands to provide suitable habitat for fish or shellfish.

Sediment/Toxicant/Pathogen Retention – The potential for the wetland to protect water quality by trapping sediments, toxicants and pathogens.

Nutrient Removal/Retention/Transformation – The effectiveness of wetlands to protect water quality and prevent adverse effects associated with excess nutrients in a watershed.

Production Export – The ability of the wetland to produce food for humans or other organisms.

Sediment/Shoreline Stabilization – The ability of a wetland to stabilize stream banks or shorelines against erosion.

Wildlife Habitat – The effectiveness of the wetland to provide suitable habitat for wildlife.

### **3.2 Values**

Recreation – The ability of the wetland and any associated waterbodies to provide consumptive (e.g. hunting) and non-consumptive (e.g. hiking) recreational opportunities.

Educational/Scientific Value – The value of the wetland as an outdoor classroom.

Uniqueness/Heritage – The value relating to the effectiveness of the wetland to provide special values such as unique geologic features.

Visual/Aesthetics – The visual or aesthetic qualities of a wetland.

Threatened/Endangered Species Habitat – The effectiveness of the wetland to support threatened or endangered species.

### **4.0 Assumptions**

The assessment of wetland functions and values can be an inherently subjective process. The Highway Methodology strives to eliminate potential bias through implementation of a qualitative and descriptive approach to functional assessment by requiring the evaluator to review a list of considerations and qualifiers for each function or value. The list of considerations/qualifiers is attached to this report as Appendix A.

The Highway Methodology lacks definitions or guidelines for certain abstruse terms associated with the considerations and qualifiers discussed, therefore, unless stated otherwise in this document, the evaluation has made the following assumptions and/or interpretations as identified below by function/value and consideration/qualifier. The considerations/qualifiers and associated assumptions are numbered to correspond to numbering identified in the Appendix A of the Highway Methodology Workbook Supplement.

#### Groundwater Recharge Function

##### Consideration/Qualifiers 1 and 2

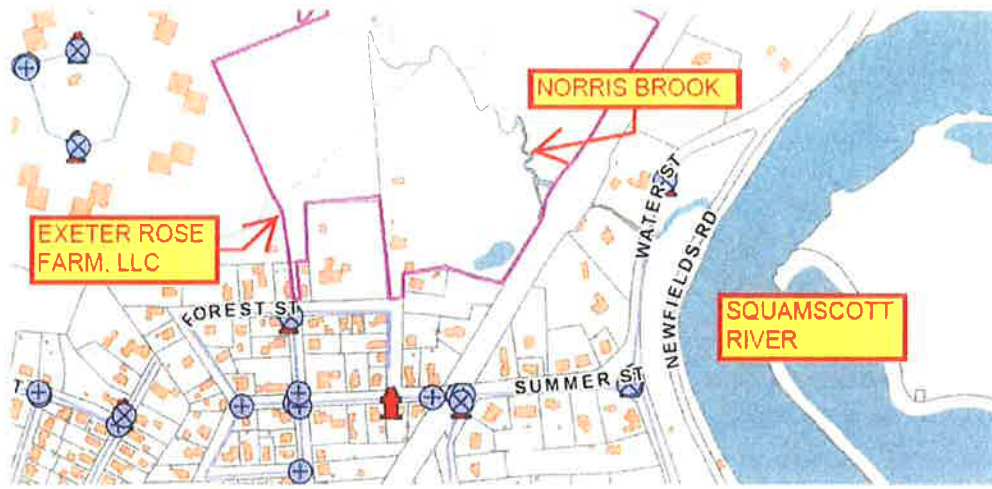
Public or private wells occur downstream of wetland. Potential exists for public or private wells downstream of the wetland.

##### Assumption

Downstream is interpreted to involve the entire watershed, even where it extends off-site, ending at the juncture with the Squamscott River for our purposes. The Highway Method does not distinguish between dug and drilled wells although their source water is frequently different. Predominant soils conditions in the area do not lend themselves to productive dug wells. The above notwithstanding, the area downstream of the subject site is served by municipal water. Refer to Figure 3 below from Exeter GIS depicting the extent of municipal water service. The bounds of Exeter Rose Farm are indicated in pink. This assumption also applies to Consideration/Qualifier 6 – Sediment/Toxicant/Pathogen Retention Function.

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**Figure 3 Exeter Municipal Water (Exeter GIS)**



**Exeter Municipal Water**

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**Consideration/Qualifiers 3 and 11**

Wetland is underlain by stratified drift. Groundwater quality of the stratified drift aquifer within or downstream of the wetland meets drinking water standards.

**Assumption**

Water quality is based on visual observation only. No samples were collected or tested. This assumption notwithstanding, there are no stratified draft deposits within the area. The area is also not considered a drinking water focus area according to the Natural Resource Inventory. Refer to Figure 4 below.

**Consideration/Qualifier 12**

Quality of water associated with the wetland is high.

**Assumption**

Water quality is based on visual observation only. No samples were collected or tested. (Applies to Number 18 under Uniqueness/Heritage also.)

**Floodflow Alteration Function**

**Consideration/Qualifier 1**

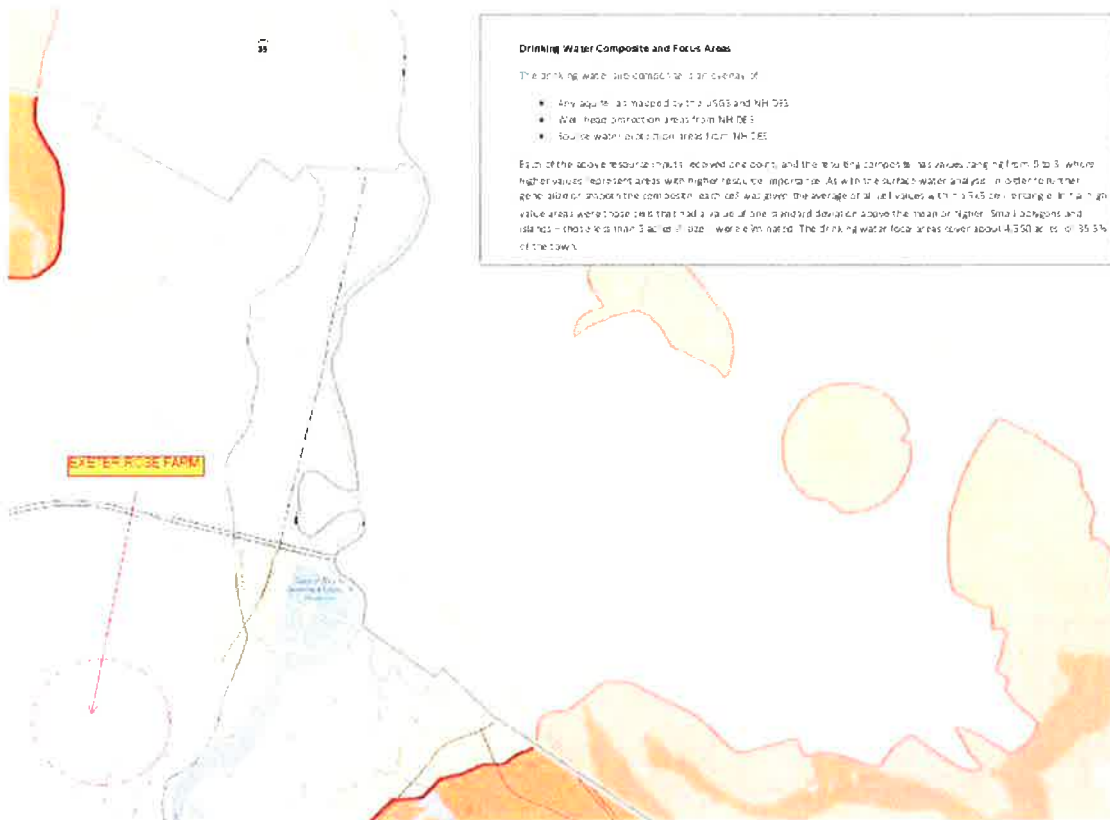
Area of this wetland is large relative to its watershed.

**Assumption**

For the purposes of this evaluation, a wetland is considered to be large relative to its contributing watershed if it represents approximately 25 percent or more of the watershed area.



**Figure 4 Drinking Water Focus Area (Exeter Natural Resource Inventory – Map 7)**



**Consideration/Qualifier 11**

Valuable properties, structures or resources are located in or near the floodplain downstream from this wetland.

**Assumption**

Downstream is interpreted to involve the entire watershed, even where it extends off-site. Therefore, it is assumed that valuable properties generally lie in or near the floodplain downstream from the wetland at some point in the watershed. It is noteworthy that Norris Brook, which drains the subject property, travels a short distance before discharging to the Squamscott River, at which point any flood affects are neutralized.

**Fish/Shellfish Habitat Function**

**Consideration/Qualifier 3**

Size of this wetland is able to support large fish/shellfish populations.

**Assumption**

Evidence of any fish/shellfish population was interpreted to constitute a large population.

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#### Sediment/Toxicant/Pathogen Retention Function

##### Consideration/Qualifier 5

Long duration water retention time is present in this wetland.

##### Assumption

Long duration water retention time is interpreted as any time period of sufficient duration that will result in settling of suspended solids constituted by sand and silt size soil particles; excluding clay size soil particles (for which settling times are often calculated in days or even weeks, not hours).

##### Consideration/Qualifier 8

The wetland is known to have existed for more than 50 years.

##### Assumption

Best professional judgment was used to estimate the relative age of wetlands. Multiple versions of county soil surveys, aerial photographs and/or topographic quadrangles were not consulted. Natural wetlands are generally assumed to be more than 50 years old.

#### Sediment/Shoreline Stabilization Function

##### Consideration/Qualifier 4

Potential sediment sources are present upstream.

##### Assumption

Upstream is interpreted to terminate at the property line.

#### Wildlife Habitat Function

##### Consideration/Qualifier 2

Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards.

##### Assumption

Water quality is based on visual observation only and is assumed to meet Class A or B standards where no obvious signs of excessive turbidity or other pollution were observed.

##### Consideration/Qualifier 14

Wetland exhibits a high degree of plant species diversity.

##### Assumption

A high degree of plant species diversity was generally assumed to be present where a preliminary inventory of plants at a representative observation location within the subject area revealed a significant number of species relative to other sites in the subject area.

##### Consideration/Qualifier 15

Wetland exhibits a high degree of diversity in plant community structure (e.g., tree/shrub/vine/grasses/mosses)

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**Assumption**

The presence of representatives of the tree, sapling, shrub, vine, herb/grass, & moss strata was interpreted to represent a high degree of diversity in plant community structure.

Recreation Value

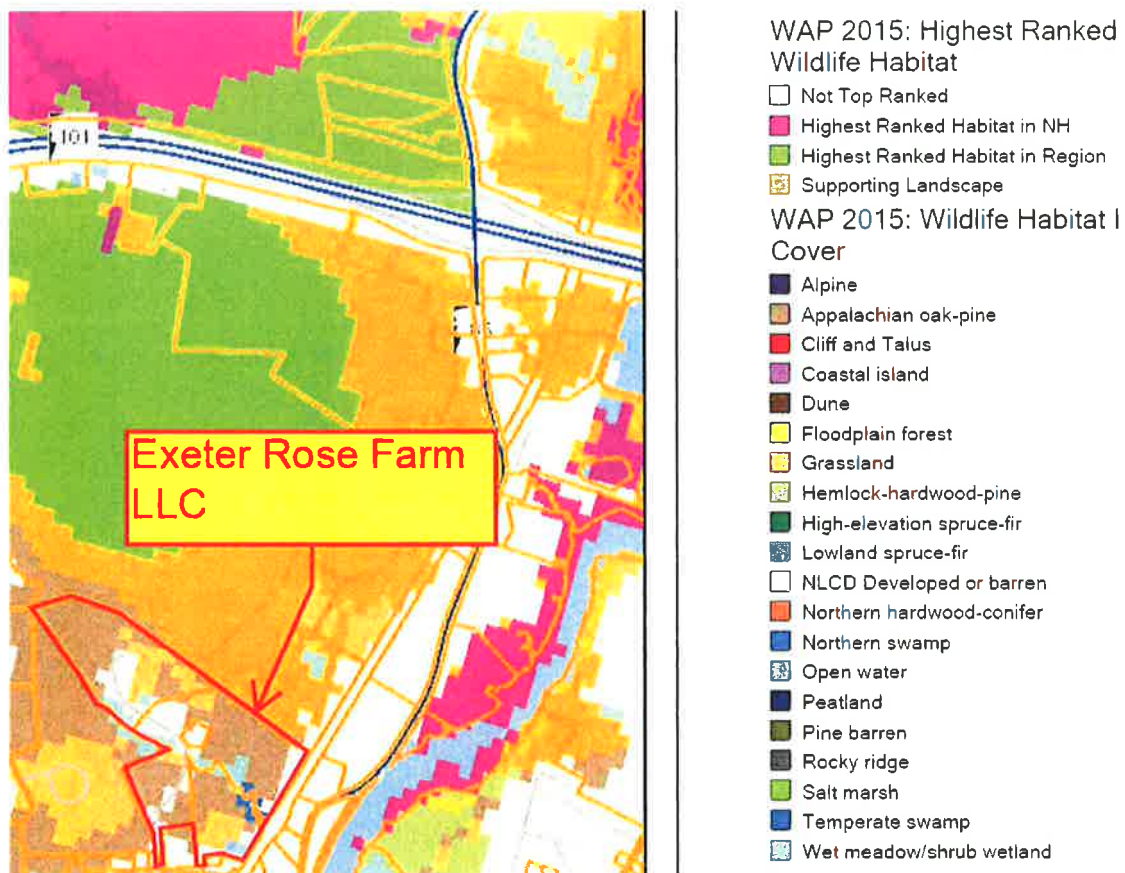
**Consideration/Qualifier 5**

Wetland is a valuable wildlife habitat.

**Assumption**

All wetlands provide habitat of one degree or another. It is our interpretation that valuable wildlife habitat refers to wetland wildlife habitat and furthermore that valuable wetland wildlife habitat possesses the physical attributes such that it can reasonably be anticipated to provide habitat for important wildlife species; those species which owe all or a significant part of their life cycle to wetlands. We note that the subject property is not identified on NH Fish and Game Wildlife Action Plan maps as providing Highest Ranked Habitat in NH or Highest Ranked Habitat in the Region. These habitat areas are shown in Figure 5 below in magenta and green respectively.

**Figure 5 Wildlife Action Plan (NH Granit)**



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In addition to notations of physical attributes made during our numerous site visits dating back to 2015, more recently we placed game trail cameras in two strategic locations within wetlands adjacent to Norris Brook, one upstream of Oak Street Extension and one downstream, to inform our evaluation of wildlife utilization in these areas. These cameras possess a detection range of 60-foot and 70-foot nighttime infrared illumination range. We have monitored the devices periodically and attached images (numbers 3 and 4) of wildlife captured by these cameras to this document.

#### Consideration/Qualifier 7

High visual/aesthetic quality of this potential recreation site.

#### Assumption

The presence of three or more wetland classes was interpreted to represent high visual and aesthetic quality. (This is consistent with Educational/Scientific Value consideration/qualifier #3, Uniqueness/Heritage Value consideration/qualifier #4 and Visual/Aesthetics Value consideration/qualifier #1.)

#### Educational/Scientific Value

#### Consideration/Qualifier 9

Potential educational site is within safe walking distance or short drive to schools.

#### Assumption

“Safe walking distance” is interpreted to be less than ¼ mile from an educational facility. (Distance is not the sole measure of a safe walk however. “Short drive” is interpreted to be less than 3 miles from an educational facility. Note that Main Street School (grades K-2) is the closest school to the site at roughly 3,500 feet.) (This interpretation also applies to Recreation above and Uniqueness/Heritage.)

#### Consideration/Qualifier 13

No known safety hazards exist within the potential educational site.

#### Assumption

“Safety hazards” exist everywhere and no activity is without risk. Safety hazards in the outdoors generally involve physical trip and fall hazards like roots, rocks and holes as well as environmental hazards such as poison ivy and bee stings; and both types are known to occur commonly on virtually every natural site. However, for the purpose of this evaluation, known safety hazard is interpreted to involve unusual hazards that a reasonable person would not expect to commonly find in the forest such as explosives, shooting ranges or hazardous waste. (This assumption/interpretation also applies to #10 Uniqueness/Heritage.)

#### Uniqueness/Heritage Value

#### Consideration/Qualifier 19

Opportunities for wildlife observation are available.

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#### Assumption

Most wildlife observations are chance encounters but it is assumed that “opportunities for wildlife observations” are available in one form or another at virtually any wetland or location if the observer is quiet and spends enough time. (Most wildlife studies and their conclusions about anticipated use by wildlife are based upon an evaluation of a particular locations physical attributes and any signs of wildlife and generally not on observations of actual wildlife.)

#### Endangered Species Habitat

##### Consideration/Qualifier 1/2

Wetland contains or is known to contain threatened or endangered species.

#### Assumption

The project has contacted the Natural Heritage Bureau (NHB) for information on rare, threatened or endangered species and a copy of NHB report is attached to this document. The project continues to work with the NHB and New Hampshire Fish and Game Department to respond to their concerns so we have not addressed this value individually for each study area.

## 5.0 List of Plants and Animals

### 5.1 List of Wildlife Observed

#### Birds

Pileated woodpecker	( <i>Dryocopus pileatus</i> ) (audio confirmation)
Black-capped chickadee	( <i>Poecile atricapillus</i> )
American robin	( <i>Turdus migratorius</i> )
Blue jay	( <i>Cyanocitta cristata</i> )
Northern cardinal	( <i>Cardinalis cardinalis</i> ) (audio confirmation)
American goldfinch	( <i>Carduelis tristis</i> )
Eastern blue bird	( <i>Sialia sialis</i> )
Dark-eyed junco	( <i>Junco hyemalis</i> )
Wild turkey	( <i>Melleagris gallopavo</i> ) (tracks)
Red-tailed hawk (overhead)	( <i>Buteo jamaicensis</i> ) (audio and visual confirmation)
Turkey vulture (overhead)	( <i>Cathartes aura</i> )
Mallard	( <i>Anas platyrhynchos</i> )

#### Mammals

Gray squirrel	( <i>Sciurus carolinensis</i> )
Raccoon	( <i>Procyon lotor</i> ) (tracks)
White-tail deer	( <i>Odocoileus virginianus</i> ) (tracks, scat, images)

#### Reptiles

Turtle	(No positive identification)
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## 5.2 List of Common Vegetation (without regard to location)

The following is a list of vegetation which was commonly observed during numerous trips to the site to identify and delineate wetlands and during other site investigations, including the site visit to make observations for the wetland functional evaluation. This is not intended to represent an exhaustive list of vegetation which can be found at the site. The site is not known to possess habitat for threatened or endangered plant (or animal) species although no exhaustive surveys for sensitive species have been undertaken. Some plant species were identified by persistent remains.

### Trees

White pine	<i>Pinus strobus</i>
Red Maple	<i>Acer rubrum</i>
American beech	<i>Fagus grandifolia</i>
Poplar	<i>Populus</i> sp.
American elm	<i>Ulmus americana</i>
White ash	<i>Fraxinus americana</i>
Gray birch	<i>Betula populifolia</i>
Black birch	<i>Betula lenta</i>
Yellow birch	<i>Betula alleghaniensis</i>
Black cherry	<i>Prunus serotina</i>
Eastern hemlock	<i>Tsuga canadensis</i>
Shagbark hickory	<i>Carya ovata</i>
Black locust	<i>Robinia pseudoacacia</i>
Box elder	<i>Acer negundo</i>
Northern Red oak	<i>Quercus rubra</i>
Black oak	<i>Quercus velutina</i>
White oak	<i>Quercus alba</i>
Hophornbeam	<i>Ostrya virginiana</i>

Some tree species can be found growing as shrubs or saplings as well.

### Shrubs / Saplings

Apple	<i>Malus</i> sp.
Red-osier dogwood	<i>Cornus sericea</i>
Red-panicked dogwood	<i>Cornus racemosa</i>
Silky dogwood	<i>Cornus amomum</i>
Bunchberry	<i>Cornus canadensis</i>
Elderberry	<i>Sambucus canadensis</i>
Honeysuckle	<i>Lonicera</i> sp.*
Ironwood	<i>Carpinus caroliniana</i>
Speckled alder	<i>Alnus rugosa</i>
Staghorn sumac	<i>Rhus typhina</i>
Wild raisin	<i>Viburnum cassinoides</i>
Arrowwood	<i>Viburnum dentatum</i>
Autumn olive	<i>Elaeagnus umbellata*</i>
Glossy buckthorn	<i>Frangula alnus*</i>

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Common buckthorn	<i>Rhamnus cathartica*</i>
Meadowsweet	<i>Spiraea latifolia</i>
Willow	<i>Salix</i> sp.
Burning bush	<i>Euonymus alatus*</i>
Winterberry	<i>Ilex verticillata</i>
Japanese barberry	<i>Berberis thunbergii*</i>
Highbush blueberry	<i>Vaccinium corymbosum</i>
Witch hazel	<i>Hamamelis virginiana</i>
Multi-flora rose	<i>Rosa multi-flora*</i>
Maleberry	<i>Lyonia ligustrina</i>

#### **Herbaceous**

Burdock	<i>Arctium minus</i>
Wood fern	<i>Dryopteris cristata</i>
Curley dock	<i>Rumex crispus</i>
Soft rush	<i>Juncus effusus</i>
Orchardgrass	<i>Dactylis glomerata</i>
Reed canary grass	<i>Phalaris arundinacea</i>
Tall fescue	<i>Festuca arundinacea</i>
Fine fescue	<i>Festuca</i> spp.
Ryegrass	<i>Lolium perenne</i>
Garlic mustard	<i>Alliaria petiolata*</i>
Goldenrods	<i>Solidago</i> spp.
Queen Anne's lace	<i>Daucus carota</i>
Broad-leaved cat-tail	<i>Typha latifolia</i>
Sensitive fern	<i>Onoclea sensibilis</i>
Cinnamon fern	<i>Osmunda cinnamomea</i>
Royal fern	<i>Osmunda regalis</i>
Purple loosestrife	<i>Lythrum salicaria*</i>
Jewelweed	<i>Impatiens capensis</i>
Japanese knotweed	<i>Polygonum cuspidatum*</i>

#### **Vines**

Grape	<i>Vitis</i> sp.
Poison ivy	<i>Toxicodendron radicans</i> (Also observed growing as a ground cover.)
Virginia creeper	<i>Parthenocissus quinquefolia</i>

#### **Aquatic**

Duckweed	<i>Lemna minor</i>
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\*These species are thought to be invasive.

### **6.0 FUNCTIONS & VALUES BY STUDY AREA**

The following section discusses and describes the functions and values of each wetland study area. The physical attributes and characteristics of each wetland study area are generally listed on the attached Wetland Function-Value Evaluation Forms or earlier in this report; therefore we have

limited the discussions below. An individual form has been completed for each wetland study area in order to appropriately manage data collection efforts and provide consistency. Similarly, it is difficult to precisely implement many of the considerations/qualifiers since most wetlands are part of larger contiguous wetland systems, only a portion of which may fall within the wetland study area. It is accepted however that conclusions about the effectiveness of a wetland study area to provide a particular function can change depending upon a host of factors which include the assessment area involved and the relative juxtaposition with other wetland resources. Conclusions regarding the functions and values associated with these wetland study areas are summarized below by area.

### **6.1 Western Intermittent Stream (Yellow) Study Area**

#### Groundwater Recharge/Discharge

Due to the surrounding surficial geology and soils this area does provide limited recharge to groundwater but groundwater discharge is apparent although limited as compared to other areas on site. Groundwater Recharge/Discharge is a principal function of this wetland area.

#### Floodflow Alteration

At 18,554± square feet (SF) or 0.42 acres, the portion of this wetland that falls on the subject property represents 2% of its watershed. The watershed was calculated at approximately 19± acres as measured starting at the juncture of the intermittent stream and Norris Brook. Our investigations suggest that the inclusion of offsite wetlands will not substantially change this percentage. The stream also has significant topographic relief. Therefore, this wetland has little opportunity to alter flood flows due to landscape position. Floodflow alteration is not a principal function of this wetland area.

#### Fish and Shellfish Habitat (Freshwater)

Forest land is dominant in the watershed that feeds to wetland. There is a dearth of cover objects present and the stream is intermittent. The wetland is of insufficient size and depth so as not to freeze in the winter. Fish and Shellfish Habitat is not a principal function of this wetland study area.

#### Sediment/Toxicant/Pathogen Retention

The wetland study area is likely a net supplier of sediment. There are no known toxicant sources in the watershed above the wetland and the wetland lies upstream of known contaminants at this site. Fine grained soils are present but retention times are very short due to topographic relief. Sediment/Toxicant/Pathogen Retention is not a principal function of this wetland area.

#### Nutrient Removal

This wetland is small compared to its watershed. Deep water and seasonal open water habitat are absent but slowly draining fine textured soils are present. The dense vegetation community needed to utilize any nutrients is generally lacking and potential sources of excess nutrients are generally



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absent in the small watershed therefore the opportunity for nutrient attenuation does not exist. Nutrient Removal is not a principal function of this wetland area.

#### Production (Nutrient) Export

The wetland area is sparsely vegetated and wildlife food sources are generally limited. Nutrient export is not a principal function of this wetland area.

#### Sediment/Shoreline Stabilization

Minor indications of erosion and siltation can be observed in this wetland. The small size, landscape position, physical attributes and lack of a permanent watercourse deny this area an opportunity to perform this function. Sediment/Shoreline Stabilization is not a principal function of this wetland area.

#### Wildlife Habitat

By our estimation, less than 40% of this wetland edge is bordered by upland wildlife habitat (brushland, woodland, active farmland, or idle land) at least 500 feet in width. Abandoned residences at the end of Oak Street Extension to the north and development / activity in the industrial park to the south are located within 500 feet. The gas main right-of-way (ROW) represents idle land and creates edge which invites both desirable and less-desirable edge species. Overland access for wildlife to other wetlands is present and the stream and adjacent upland could provide a corridor for more tolerant wildlife species. Wildlife food sources are limited. The wetland does not exhibit a high degree of interspersions of wetland classes and/or open water nor are inclusions of upland present within the wetland. The density of wetland vegetation and degree of diversity is low as is diversity of plant community structure. The wetland study area may provide some suitability for wildlife that is not utterly dependent upon wetlands or for species that can readily adapt to life in other wetlands however, it is not thought that wildlife habitat is a principal function of this wetland area.

#### Recreation

The wetland is not part of an official recreation area, park, or refuge although it extends into land that comprises the Henderson-Swasey Town Forest which is approximately 250 acres in size and prohibits hunting. Hunting opportunities are very limited, due to proximity to residential dwellings and other development, as are fishing opportunities, due to the intermittent flow. The potential for hiking in the classic sense is low but adjacent uplands provide a suitable connection to the town forest and an existing trail crosses the wetland study area. The wetland does not possess a high visual or aesthetic quality nor is it suitable for boating or canoeing. Most wetlands have some suitability for recreation and this wetland is no exception, but recreation is not a principal value of this wetland area.

#### Educational/Scientific Value

The potential educational site is relatively undisturbed (the culvert in the gas ROW near the property line notwithstanding) and does not contain a diversity of wetland classes. The wetland is

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not considered important wildlife habitat and is not located in or adjacent to a nature preserve or wildlife management area. No signs of wildlife enhancement, such as bird houses and nesting boxes, exist on site. The wetland is not permanently flooded and the stream is intermittent. Potential off-road parking is currently available for a small bus and the wetland is a short drive but not a safe walk to or from local schools. All wetlands have some suitability for educational purposes and this wetland is no exception, however educational/scientific values are not principal values of this wetland area.

#### Uniqueness/Heritage

Urbanization to the south increases the importance of this wetland. The wetland lacks permanent open water, a high degree of interspersed wetland classes and open water, three or more wetland classes and a suitable viewing area. The wetland is not known to be a site for research and is not a natural landmark or an exemplary natural community. The wetland is not an important archaeological site nor does it possess natural geologic or biological features which are locally rare. The wetland is not connected to a state or federally designated scenic river. Potential off-road parking is available for a smaller bus, accessibility is reasonably good and the wetland is a short drive (but not a safe walk) to or from schools. Uniqueness / Heritage is not a principal value of this wetland area.

#### Visual Quality/Aesthetics

The wetland is not dominated by flowering plants or plants that turn vibrant colors in the fall or other seasons. Wetland views are generally absent of trash, debris and other signs of disturbance although adjacent uplands are not. Residential development can be seen from the wetland, especially outside the growing season. The wetland is not considered to be important wildlife habitat. Activity associated with the industrial park can be heard from this wetland. Unpleasant odors were not detected at this wetland. Visual Quality/Aesthetics is not a principal value of this wetland area.

### **6.2 Norris Brook – Upstream (Blue) Study Area**

#### Groundwater Recharge/Discharge

Due to the surficial geology and soils of surrounding upland areas this wetland provides significant groundwater discharge, which helps to provide base flow and sustain perennial flow for Norris Brook during periods of low precipitation. Groundwater Discharge is a principal function of this wetland area.

#### Floodflow Alteration

At approximately 82,830 SF or 1.9± acres in size, the portion of this wetland that falls within the confines of the site represents 0.42% of its watershed, which is almost 0.7± square miles (as measured starting where Norris Brook intersects Oak Street Extension. One square mile is roughly 640 acres.).

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It should be noted that the figure above includes 668 SF of wetlands (associated with a groundwater seep) which are contiguous to other wetlands associated with Norris Brook but are separated by the property line. Inclusion of the off-site wetlands located between the seep and Norris Brook does not change our conclusions regarding floodflow alteration as this land is steep and does not play a significant role in this function.

The man-made retention pond at the west end of this study area is hydrologically connected to the wetland but it is our observation that the area primarily contains groundwater. Also, its location in the wetland system appears to provide very little additional floodflow alteration benefit.

Norris Brook is moderately sinuous in this area and the vegetation is relatively dense. The 36-inch diameter culvert at Oak Street Extension may be undersized and is also significantly plugged with debris, which acts as a constriction to flow. The Squamscott River is located downstream approximately 1,375 feet distant and there are a limited number of valuable properties downstream which argues against this wetland study area being considered important to flood alteration. It is our feeling however that meaningful alteration of floodflows is being provided (albeit artificially due to the plugged culvert) and thus represents a principal function of this wetland area.

#### Fish and Shellfish Habitat (Freshwater)

Forest is the dominant cover type in the watershed above this wetland and an abundance of cover objects are present. The culvert discussed above provides a significant impediment to aquatic organism passage due to the fact that the culvert is significantly plugged with debris. Also, the slope of the pipe presents an impediment to aquatic organism passage, especially at low flow. Fish and Shellfish Habitat is therefore not a principal function of this wetland area.

#### Sediment/Toxicant/Pathogen Retention

Norris brook is a potential source of sediment as is the aforementioned western intermittent stream as well as Watson Brook which is experiencing apparent channel and bank erosion. The wetland has demonstrable floodflow desynchronization characteristics and there are known toxicants in the watershed. We believe that Sediment/Toxicant/Pathogen Retention is a principal function of this wetland study area.

#### Nutrient Removal

The wetland is small relative to its contributory watershed and open water and deep water habitat are absent most of the time (with the possible exception of during large storm events due to the culvert being plugged). The wetland is saturated for most of the season and deep fine grained sediments are present. Dense woody vegetation is generally present and the opportunity, albeit limited, for nutrient attenuation exists. Nutrient Removal is a principal function of this wetland area.

#### Production (Nutrient) Export

The wetland area is densely vegetated but wildlife food sources are limited and commercial sources are absent. The fertile frond of sensitive fern can provide food for birds such as American woodcock (*Philohela minor*) and wild turkey (*Meleagris gallopavo*). Flowering plants exist,

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including purple loosestrife, and can be used by nectar-gathering insects. Fish and shellfish are not found in this wetland. Most wetlands provide some suitability for nutrient production and export but Nutrient Export is not a principal function of this wetland area.

#### Sediment/Shoreline Stabilization

Minor indications of erosion and siltation can be observed in this wetland and the Norris Brook channel is a net sediment producer but the stream channel is largely at equilibrium with the exception of the juncture with Watson Brook which is actively eroding. However, landscape position, the lack of open water and lack of suitability for boating generally deny this area an opportunity to perform this function. Sediment/Shoreline Stabilization is not a principal function of this wetland area.

#### Wildlife Habitat

The wetland area has been altered by human/development activity and is fragmented by development (Oak Street Extension – however, since Oak Street Extension was used as the basis to define this study area fragmentation may not apply). The upland surrounding this wetland is partially developed therefore less than 40 percent of the wetland edge is bordered by upland wildlife habitat at least 500-feet in width. The north slope overlooking this wetland was filled with solid waste and other debris and much of the vegetation in the adjacent upland habitat closest to the wetland involves what has grown since the area was last altered. The wetland is directly contiguous with other wetland ecosystems via an intermittent watercourse. Overland access to other wetlands is present. The presence of speckled alder in certain locations is conducive to woodcock populations. Significant avian activity has been observed during site visits. The wetland does not exhibit a high degree of interspersions of wetland classes and/or open water nor are inclusions of upland within the wetland present. The density of wetland vegetation and degree of diversity is moderate to high. In our opinion the wetland study area is providing significant local habitat therefore Wildlife habitat is a principal function of this wetland area. It is worth noting that the New Hampshire Fish and Game – Wildlife Action Plan did not indicate this area as Highest Ranked Habitat in NH (depicted in magenta on Figure 5) or Highest Ranked Habitat in the Region (depicted in green on Figure 5). The area depicted in green in Figure 5 on page 15 appears to coincide with the Henderson-Swasey Town Forest.

#### Recreation

The wetland is not part of an official recreation area, park, or refuge. The wetland could be considered valuable wildlife habitat but hunting opportunities are very limited, if not prohibited, due to proximity to residential dwellings and other development, as are fishing opportunities due to the culvert discussed previously. The potential for hiking is unlikely but adjacent uplands (at the top-of-slope) may provide a more suitable potential connection to the town forest upon further investigation. The wetland does not possess a high visual or aesthetic quality nor is it suitable for kayaking, boating or canoeing. Norris Brook is perennial but the stream is less than 10-feet wide on average and the navigable distance is too short to be attractive. Most wetlands have some suitability for recreation and this wetland is no exception, but recreation is not a principal value of this wetland area.

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#### Educational/Scientific Value

The wetland could be considered valuable wildlife habitat but is not located in a nature preserve or wildlife management area. Signs of wildlife habitat enhancement are absent. The potential educational site is disturbed by filling and solid waste disposal and does not contain a diversity of wetland classes. No signs of wildlife enhancement, such as bird houses and nest boxes, exist on site. The wetland is not permanently flooded but Norris Brook is perennial. Potential off-road parking is currently available for a small bus and the wetland is a short drive but not a safe walk to or from local schools. All wetlands have some suitability for educational purposes and this wetland is no exception, however educational/scientific values are not principal values of this wetland area.

#### Uniqueness/Heritage

The wetland lacks permanent open water, a high degree of interspersed wetland classes and open water and three or more wetland classes. There is no apparent location within the wetland that represents a primary viewing location. The best overall view is from Oak Street Extension or the top-of-slope from adjacent uplands due to the steep slopes but these views are generally only available during the winter when the leaves are off the trees. These primary viewing locations will also include views of adjacent single-family or multifamily residential development. The wetland is not known to be a site for research and is not a natural landmark or an exemplary natural community. The wetland is not an important archaeological site nor does it possess natural geologic or biological features which are locally rare. The wetland is not connected to a state or federally designated scenic river. Potential off-road parking is available for a small bus. The wetland is a short drive (but not a safe walk) to or from schools but accessibility can be challenging due to steep slopes. Solid waste may pose a safety hazard. Urbanization to the south increases the importance of this wetland but Uniqueness/Heritage is not a principal value of this wetland area.

#### Visual Quality/Aesthetics

The wetland is not dominated by flowering plants but has a significant population of red maple trees and saplings that turn vibrant colors in the fall or other seasons. Residential or other development cannot be seen from the wetland due to adjacent steep slopes but can be viewed while gaining access. The wetland could be considered valuable wildlife habitat. The wetland lacks a good primary viewing location and multiple wetland classes are absent. While, unpleasant odors were not detected at this wetland, Visual Quality/Aesthetics is not a principal value of this wetland area.

### **6.3 Norris Brook – Downstream (Green) Study Area**

#### Groundwater Recharge/Discharge

Due to the surficial geology and soils of surrounding upland areas, which sometimes involve a sandy cap over silt and clay sediments, this wetland provides significant groundwater discharge, which helps to provide base flow and sustain perennial flow for Norris Brook and the unnamed perennial stream during periods of low precipitation. Groundwater Discharge is a principal function of this wetland area.

#### Floodflow Alteration

At approximately 145,448 SF or 3.34± acres in size, (including the pond – which is approximately 0.2± acres) this wetland represents 0.5% of its watershed, which is 1.06 square miles (as measured starting at the intersection of Norris Brook and the railroad tracks and includes the watershed for the unnamed intermittent stream which was measured at 0.16 square miles). Norris Brook is moderately sinuous in this area and vegetation is relatively dense. The granite block box culvert at the railroad tracks may be slightly undersized for larger storms, which acts as a minor constriction to flow. The Squamscott River is located downstream approximately 600 feet distant (from where this study area meets the railroad tracks and property line) and there are a limited number of valuable properties downstream, which argues against this wetland study area being considered important to flood alteration. It is our feeling however that, when considered with the pond and concrete structure, and due to other the characteristics of the larger drainage basin, meaningful alteration of floodflows is being provided. The floodflow alteration may not be as significant as the desynchronization provided by the segment of Norris Brook upstream (west) of Oak Street Extension but still represents a principal function of this wetland area.

#### Fish and Shellfish Habitat (Freshwater)

Forest is the dominant cover type in the watershed above this wetland and an abundance of cover objects are present. The granite block box culvert beneath the railroad provides better than average aquatic organism passage during higher flows but the bottom of the culvert is plugged with debris, up against which sediment has accumulated to a depth of approximately 18 inches. We can confirm that we have never observed Norris Brook not to be flowing but we have also never observed fish in Norris Brook during numerous visits to the site. Fish and Shellfish Habitat is therefore not a principal function of this wetland area.

#### Sediment/Toxicant/Pathogen Retention

Norris brook is a potential source of sediment as is the unnamed perennial stream described earlier which is experiencing apparent channel and bank erosion. The wetland appears to have demonstrable floodflow desynchronization characteristics and there are known toxicants in the watershed. We therefore believe that Sediment/Toxicant/Pathogen Retention is a principal function of this wetland study area.

#### Nutrient Removal

The wetland is small relative to its contributory watershed and open water and/or deep water habitat are absent most of the time (with the possible exception of during large storm events). The wetland is saturated for most of the season and deep fine grained sediments are present. Dense woody vegetation is generally present and limited opportunity for nutrient attenuation exists. Nutrient Removal is a principal function of this wetland area.

#### Production Export

The wetland area is densely vegetated but wildlife food sources are limited and commercial sources are absent. Flowering plants exist, including purple loosestrife, and can be used by nectar-gathering insects. Fish and shellfish are not found in this wetland. Most wetlands provide some

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suitability for nutrient production and export but Nutrient Export is not a principal function of this wetland area.

#### Sediment/Shoreline Stabilization

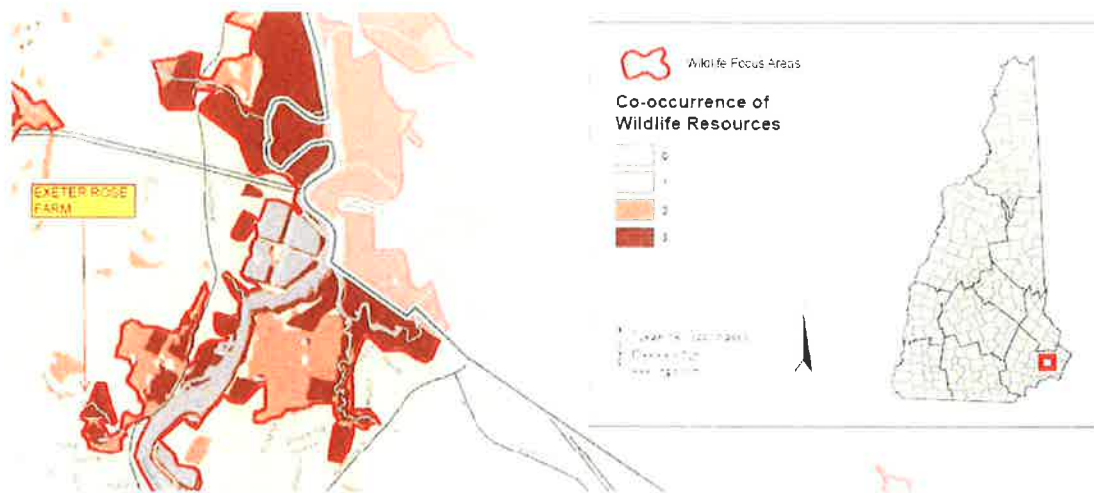
Indications of erosion and siltation can be observed in this wetland and the Norris Brook channel is a net sediment producer but the stream channel is largely at equilibrium. The unnamed perennial stream is actually less stable than Norris Brook and is also a net supplier of sediment. However, landscape position, the lack of open water and fetch as well as lack of suitability for boating generally signify that this wetland area has no opportunity to provide this function. Sediment / Shoreline Stabilization is therefore not a principal function of this wetland area.

#### Wildlife Habitat

The wetland area has been altered by human/development activity and the larger wetland system has been fragmented by development (the railroad and Oak Street Extension – Oak Street Extension was used as the basis to define this study area so fragmentation may not apply). The upland surrounding this wetland is partially developed but more than 40 percent of the wetland edge is bordered by upland wildlife habitat at least 500-feet in width by our estimation. The 500-foot buffer is largely forested on the north side and is comprised of forest and grassland on the south side. The wetland is directly contiguous with other wetland ecosystems via an intermittent watercourse (the eastern intermittent stream study area). Overland access to other wetlands is present. Significant avian activity has been observed during site visits. The wetland exhibits a higher degree of interspersion of wetland classes than the Norris Brook – Upstream (Blue) Study Area.

With the exception of the pond impounded by the concrete structure, open water is generally absent and there are no inclusions of upland present within the wetland study area. The pond provides habitat for wading and aquatic birds species. The density of wetland vegetation and degree of diversity is moderate to high. Wildlife signs such as tracks and scat as well as cameras that were installed indicate species such as deer and turkey are utilizing the area. Wildlife and turkey are species that have a higher than average tolerance for human disturbance and activity. The physical attributes of the wetland and wildlife sign observed generally indicate that Wildlife Habitat is a principal function of this wetland area and provides valuable local habitat. It is noteworthy that the New Hampshire Fish and Game – Wildlife Action Plan (WAP) did not indicate this area or any part of the subject property as Highest Ranked Habitat in NH (depicted in magenta on Figure 5) or Highest Ranked Habitat in the Region (depicted in green on Figure 5). Conversely, the Wildlife Composite Map found in the Natural Resource Inventory identifies this wetland study area as a wildlife focus area having a co-occurrence of three major characteristics that include highest ranked habitat in NH from the WAP and rare species/communities from the Natural Heritage Bureau among numerous other criteria. Refer to Figure 5 on page 15 and Figure 6 below.

**Figure 6 Wildlife Composite Map (Exeter Natural Resource Inventory – Map 8)**



#### Recreation

The wetland is not part of an official recreation area, park, or refuge. The wetland appears to have significant avian activity and therefore presents some birdwatching opportunities, especially for those willing to venture off the beaten path. The wetland could be considered valuable wildlife habitat but hunting opportunities are very limited, if not prohibited, due to proximity to residential dwellings and other development, as are fishing opportunities. The potential for hiking is unlikely but adjacent uplands (at the top-of-slope) may provide a suitable connection to the town forest. The wetland does not possess a high visual or aesthetic quality nor is it suitable for kayaking, boating or canoeing. Norris Brook is perennial but the stream is less than 10–feet wide and the navigable distance is too short to be attractive to canoers or kayakers. Most wetlands have some suitability for recreation and this wetland is no exception, but overall recreation is not a principal value of this wetland area.

#### Educational/Scientific Value

The wetland could be considered valuable wildlife habitat but is not located in a nature preserve or wildlife management area. Signs of wildlife habitat enhancement are absent. The potential educational site is relatively undisturbed but does contain some diversity of wetland classes. No signs of wildlife enhancement, such as bird houses and nest boxes, exist on site. The wetland is not permanently flooded (with the exception of the pond) but Norris Brook is perennial. Potential off-road parking is currently available for a small bus and the wetland is a short drive but not a safe walk to or from local schools. Access could be challenging due to the steep slopes adjacent to the wetland study area. All wetlands have some suitability for educational purposes and this wetland is no exception, however Educational / Scientific values are not principal values of this wetland area.



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#### Uniqueness/Heritage

The wetland lacks permanent open water, a high degree of interspersed wetland classes or open water and three or more wetland classes. The wetland is not known to be a site for research and is not a natural landmark or an exemplary natural community. The wetland is not known to be an important archaeological site nor does it possess biological features which are locally rare. The wetland includes a productive spring referred to by some as the Jailhouse Spring which is visited frequently. Urbanization to the south increases the importance of this wetland. The site also has history as a brickyard. The wetland is not connected to a state or federally designated scenic river. Potential off-road parking is available, but not for a full size bus. Accessibility can be challenging due to the steep slopes and the wetland is a short drive to or from schools but walking to the site for school aged children is not realistic. Uniqueness/Heritage could be considered a principal value of this wetland study area.

#### Visual Quality/Aesthetics

The wetland is not dominated by flowering plants but has a meaningful population of red maple trees and saplings that likely turn vibrant colors in the fall. Residential or other development cannot be seen from the wetland (except when the leaves are off) due to adjacent steep slopes but can be viewed while gaining access. The wetland could be considered valuable wildlife habitat. With the possible exception of the granite block box culvert at the railroad, the wetland lacks a good primary viewing location and multiple wetland classes are absent. The noise level at this wetland study area can be intermittently high or distracting due to passing trains. Unpleasant odors were not detected at this wetland, but Visual Quality/Aesthetics is not a principal value of this wetland area.

### **6.4 Eastern Intermittent Stream (Red) Study Area**

#### Groundwater Recharge/Discharge

The drainage basin that contributes to this wetland has similar surficial geology and soils as other areas in this evaluation and provides limited groundwater discharge as compared to wetlands associated with Norris Brook and the unnamed perennial stream. Groundwater Recharge / Discharge is a principal function of this wetland area however.

#### Floodflow Alteration

At 38,448± SF or 0.88 acres, the portion of this wetland that falls on the subject property represents <1% of its watershed. The watershed was calculated at approximately 122± acres as measured beginning at the juncture of the intermittent stream and Norris Brook. Our investigations suggest that the inclusion of offsite wetlands will not result in the wetland constituting a large percentage of the watershed. The stream associated with these wetlands is intermittent and also has significant topographic relief. However, the topography of the basin and other attributes suggest that this wetland can play a minor role in floodflow alteration in this subwatershed. Floodflow Alteration is a principal function of this wetland area.

#### Fish and Shellfish Habitat (Freshwater)

Forest land is dominant in the contributory watershed. The stream channel is poorly defined in most locations. Cover objects are generally absent and the stream is intermittent. The wetland is of insufficient size and depth and does not possess the physical attributes to prevent it from freezing or icing over in the winter. Fish and Shellfish Habitat is not a principal function of this wetland study area.

#### Sediment/Toxicant/Pathogen Retention

The wetland study area is likely a net supplier of sediment. There are no known toxicant sources in the watershed above the wetland. Fine grained soils are present but retention times are very short due to topographic relief and basin topography. Sediment/Toxicant/Pathogen Retention is not a principal function of this wetland area.

#### Nutrient Removal

This wetland is small compared to its watershed. Deep water and seasonal open water habitat are absent but slowly draining fine textured soils are present. A locally dense vegetation community exists and potential sources of excess nutrients are generally absent in the watershed therefore the opportunity for nutrient attenuation does not exist. Nutrient Removal is not a principal function of this wetland area.

#### Production (Nutrient) Export

The wetland area is sporadically vegetated and wildlife food sources are generally limited. Nutrient Export is not a principal function of this wetland area.

#### Sediment/Shoreline Stabilization

Minor indications of erosion and siltation can be observed in this wetland. The small size, landscape position, physical attributes and lack of open water or a permanent watercourse deny this area an opportunity to perform this function. Sediment/Shoreline Stabilization is not a principal function of this wetland area.

#### Wildlife Habitat

By our estimation, less than 40% of this wetland edge is bordered by upland wildlife habitat (brushland, woodland, active farmland, or idle land) at least 500 feet in width although 300 feet is plausible on site. Residences along Oak Street Extension and the railroad are located within 500 feet. Overland access for wildlife to other wetlands is present and the stream and adjacent upland could provide a corridor for wildlife. Wildlife food sources are limited. The wetland does not exhibit a high degree of interspersions of wetland classes and/or open water nor are inclusions of upland present within the wetland. The density of wetland vegetation is high in places and degree of diversity is low as is diversity of plant community structure. The wetland study area may provide some suitability for common wildlife and those species which are not critically dependent upon wetlands however it is our opinion that Wildlife Habitat is not a principal function of this wetland area.

#### Recreation

The wetland is not part of an official recreation area, park, or refuge. Hunting opportunities are very limited, due to proximity to residential dwellings and other development, as well as the railroad. Fishing opportunities are absent due to the intermittent flow. The potential for hiking in the adjacent uplands exists and one walking/biking trail that crosses the wetland was observed. The wetland does not possess a high visual or aesthetic quality nor is it suitable for boating, canoeing or kayaking. Most wetlands have some suitability for recreation and this wetland is no exception, but Recreation is not a principal value of this wetland area.

#### Educational/Scientific Value

The potential educational site is relatively undisturbed (the nearby railroad, bike path and old access road notwithstanding) but does not contain a diversity of wetland classes. The wetland is not considered important wildlife habitat and is not located in or adjacent to a nature preserve or wildlife management area, although the town forest is not far away. No signs of wildlife enhancement, such as bird houses and nesting boxes, exist on site. The wetland is not permanently flooded and the stream is intermittent. Potential off-road parking is currently available for a small bus approximately 1,000 feet away on Oak Street Extension but there is no path between the apparent parking location and the wetland. A foot path along the railroad tracks exists but is not considered safe and may not be legal. The wetland is a short drive but not a safe walk to or from local schools. Educational/Scientific Values are not principal values of this wetland area.

#### Uniqueness/Heritage

Urbanization to the south increases the importance of this wetland. The wetland lacks permanent open water, a high degree of interspersion of wetland classes and open water, three or more wetland classes and a suitable viewing area. The wetland is not known to be a site for research and is not a natural landmark or an exemplary natural community. The wetland is not an important archaeological site nor does it possess natural geologic or biological features which are locally rare. The wetland is not connected to a state or federally designated scenic river. Potential off-road parking is available for a smaller bus, accessibility is questionable and the wetland is a short drive (but not a safe walk) to or from schools. Uniqueness / Heritage is not a principal value of this wetland area.

#### Visual Quality/Aesthetics

The wetland is not dominated by flowering plants or plants that turn vibrant colors in the fall or other seasons. Wetland views are generally absent of trash, debris and other signs of disturbance. Limited residential development along Oak Street Extension can be seen from the wetland, especially outside the growing season. The wetland is not considered to be important wildlife habitat. The railroad can easily be heard from this wetland. Unpleasant odors were not detected at this wetland. Visual Quality/Aesthetics is not a principal value of this wetland area.

**7.0 SUMMARY AND DISCUSSION**

The Highway Methodology identifies 13 primary functions and values which can potentially be ascribed to wetlands. The presence of these functions and values provide benefits for society and the environment.

Our findings resulted in a conclusion that the **Western Intermittent Stream (Yellow) Study Area** possesses one (1) principal function – Groundwater Discharge. The observations made of wetland attributes resulted in a conclusion that the **Norris Brook – Upstream (Blue) Study Area** possesses or provides five (5) principal functions: Groundwater Discharge, Floodflow Alteration, Sediment / Toxicant Retention, Nutrient Removal and Wildlife Habitat. The findings resulted in a conclusion that **Norris Brook – Downstream (Green) Study Area** possesses or provides six (6) principal functions: Groundwater Discharge, Floodflow Alteration, Sediment / Toxicant Retention, Nutrient Removal, Wildlife Habitat and Uniqueness/Heritage. The **Eastern Intermittent Stream (Red) Study Area** findings indicate a total of two (2) principal functions: Groundwater Discharge and Floodflow Alteration. Refer to Table 1 below.

**TABLE 1 TALLY OF PRINCIPAL FUNCTIONS / VALUES BY STUDY AREA**

	<b>STUDY AREA</b>			
<b>Function/Value</b>	<b>Yellow</b>	<b>Red</b>	<b>Green</b>	<b>Blue</b>
<b>Groundwater</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
<b>Floodflow Alteration</b>	<b>N</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
<b>Fish / Shellfish</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>
<b>Sediment/Toxicant</b>	<b>N</b>	<b>N</b>	<b>Y</b>	<b>Y</b>
<b>Nutrient Removal</b>	<b>N</b>	<b>N</b>	<b>Y</b>	<b>Y</b>
<b>Production Export</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>
<b>Shoreline Stabilization</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>
<b>Wildlife Habitat</b>	<b>N</b>	<b>N</b>	<b>Y</b>	<b>Y</b>
<b>Recreation</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>
<b>Educational Value</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>
<b>Uniqueness / Heritage</b>	<b>N</b>	<b>N</b>	<b>Y</b>	<b>N</b>
<b>Visual Quality</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>
<b>TOTAL</b>	<b>1</b>	<b>2</b>	<b>6</b>	<b>5</b>

The Norris Brook – Downstream (Green) Study Area has the largest number of principal functions and generally speaking represents the most valuable wetland on this site although the Norris Brook – Upstream (Blue) Study area is very similar in function and value. This is not surprising since they have many similar physical attributes and are essentially the same wetland which was bisected by the construction of Oak Street Extension. Assessing overall wetland value simply based upon the number of principal functions provided may not be appropriate however.

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We note that all four wetland study areas support groundwater discharge as a principal function. Groundwater discharge is a function of the dominant upland soil conditions in the area which generally involve sandy textures of varying thickness over deep, slowly permeable silt and clay textures. This corroborates our investigations which confirm that there are no stratified drift deposits and thus no suitable aquifers in the area and therefore groundwater recharge is not a principal function of any of the wetlands on this site. These findings demonstrate however that meaningful infiltration of precipitation is taking place in uplands adjacent to site wetlands and this infiltration is contributing to base flow in Norris Brook and other streams.

We have indicated floodflow alteration as a principal function of the Norris Brook – Upstream (Blue) Study Area on the attached data form. The presence of floodflow alteration function within a wetland system and the indication that it is a principal function implies that the wetland system has the ability to prevent property damage by storing flood waters and desynchronizing peak flows associated with a storm or flood event. It should be noted that a significant part of the function in this case is a result of the construction of Oak Street Extension as well as the partially plugged culvert, both of which are providing a constriction of stream flow. If the culvert is cleaned or replaced and enlarged this floodflow alteration function will likely be reduced. This is unlikely to have a significant impact on downstream properties however, of which there are few.

Due to the topography in the general area of this wetland, the plugged culvert and any associated flooding has little effect on surrounding upstream properties. Oak Street itself actually represents the lowest elevation in the area at this point in the subwatershed and is at greatest risk for damage should the pipe become completely plugged or plugged sufficiently that a particular storm causes water to back up and overtop the road. If this were to happen the resulting erosion and sedimentation could have negative ramifications for downstream wetlands. Also, were Oak Street Extension to overtop and fail, downstream properties could be affected although the granite block box culvert at the railroad would significantly mitigate the effects. A cleaning of the pipe and installation of a trash rack of some sort may be warranted. Any trash rack should not be installed at the mouth of the pipe however. A trash rack is not a panacea however as it also requires maintenance.

The conclusions above are not to suggest that the various wetland study areas do not perform or provide any function or value or that they cannot provide or perform any function that is not identified as a principal function; however the data and our observations and subsequent conclusions confirm that the wetlands do not perform or provide those functions at an elevated or significant level. For those interpreting this report, caution needs to be applied when deriving conclusions about impact assessment when using the findings within. Additionally, do not be easily tempted to rank or compare the wetlands described within this report against one another and certainly against other off-site wetlands. Ranking wetlands numerically or rating wetlands low, medium or high is tempting but is inappropriate and implies a level of accuracy or understanding of the wetlands and functional evaluation methodologies which may not exist.

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April 3, 2018

EXETER ROSE FARM, LLC  
FUNCTIONAL WETLAND EVALUATION  
PHOTOGRAPHS & DESCRIPTIONS

Exeter Rose Farm, LLC  
Exeter, NH  
April 3, 2018



Image 1 – Unnamed perennial stream. Note bricks and turbidity. (©Jacobs2018)



Image 2 – Juncture of unnamed perennial stream and Norris Brook (background). Note plume of slightly turbid water in foreground and on right side of Norris Brook. (©Jacobs2018)

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April 3, 2018



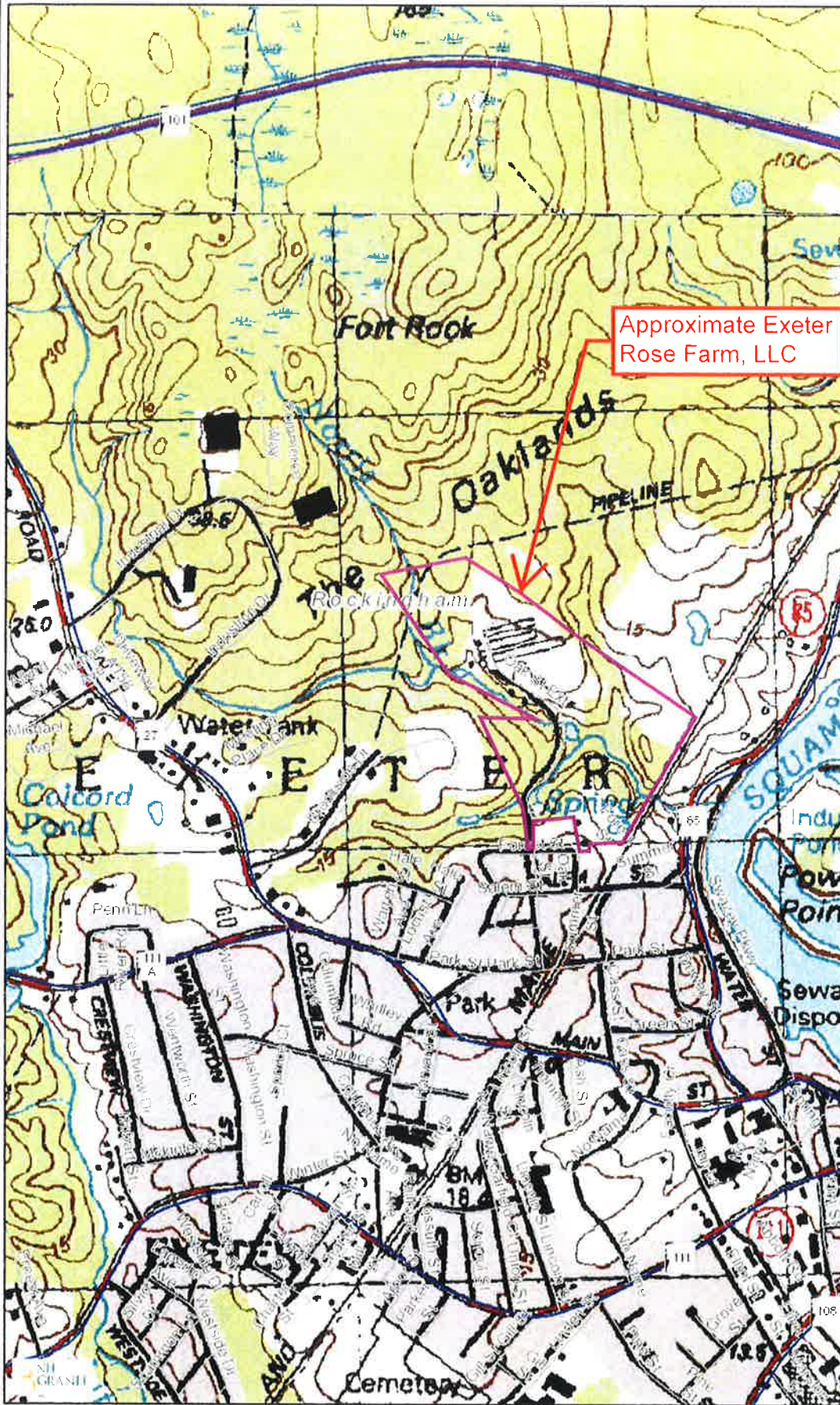
Image 3 – Wildlife camera image in the Green Wetland Study Area looking upstream (west) along Norris Brook. Note existing home in on left in center background and deer on right in foreground (*@Jacobs2018*)



Image 4 – Wildlife camera image in the Green Wetland Study Area looking upstream (west) along Norris Brook. Note existing home on left in center background and deer on right in foreground (*@Jacobs2018*)



# Map by NH GRANIT



## Legend

- State
- County
- City/Town
- Interstates
- Turnpikes
- US Routes
- State Routes
- Local Roads

Approximate Exeter  
Rose Farm, LLC

EXHIBIT 1

Map Scale

1: 12,988



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Map Generated: 8/18/2016

## Notes

Rose Farm  
Oak Street Extension  
Exeter, NH





**Memo**



NH NATURAL HERITAGE BUREAU  
 NHB DATACHECK RESULTS LETTER

**To:** Marc Jacobs, Consulting Natural Scientist  
 P.O. Box 417  
 Greenland, NH, NH 03840-0417

**From:** Amy Lamb, NH Natural Heritage Bureau

**Date:** 10/31/2016 (valid for one year from this date)

**Re:** Review by NH Natural Heritage Bureau

NHB File ID: NHB16-3245

Town: Exeter

Location: Tax Maps: Map 54 Lots 5, 6 & 7; Map  
 63 Lot 205

**Description:** Properties being considered for future multi-unit residential development. Project currently in conceptual design phase.  
**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 contact NHB if the proposed project includes impacts to tidal streams/wetlands, or to emergent/scrub-shrub wetlands. Contact NH Fish & Game regarding wildlife concerns.**

Plant species	State <sup>1</sup>	Federal	Notes
little-headed spikesedge ( <i>Eleocharis parvula</i> )	T	--	Threats are primarily alterations to the hydrology of the wetland, such as ditching or tidal restrictions that might affect the sheet flow of tidal waters across the intertidal flat, activities that eliminate plants, and increased input of nutrients and pollutants in storm runoff.
sharp-flowered manna grass ( <i>Glyceria acutiflora</i> )	E	--	Primarily vulnerable to changes to the hydrology of its habitat, especially alterations that change water levels. It may also be susceptible to increased pollutants and nutrients carried in stormwater runoff.
Spongy-leaved Arrowhead ( <i>Sagittaria montevidensis</i> ssp. <i>spongiosa</i> )	E	--	Primarily vulnerable to changes to the hydrology of its habitat, especially alterations that change water levels. It may also be susceptible to increased pollutants and nutrients carried in stormwater runoff.
Vertebrate species	State <sup>1</sup>	Federal	Notes
American Eel ( <i>Anguilla rostrata</i> )	SC	--	Contact the NH Fish & Game Dept (see below).
Northern Black Racer ( <i>Cohber constrictor constrictor</i> )	T	--	Contact the NH Fish & Game Dept (see below).

<sup>1</sup>Codes: "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.

## Memo



NH NATURAL HERITAGE BUREAU  
NHB DATACHECK RESULTS LETTER

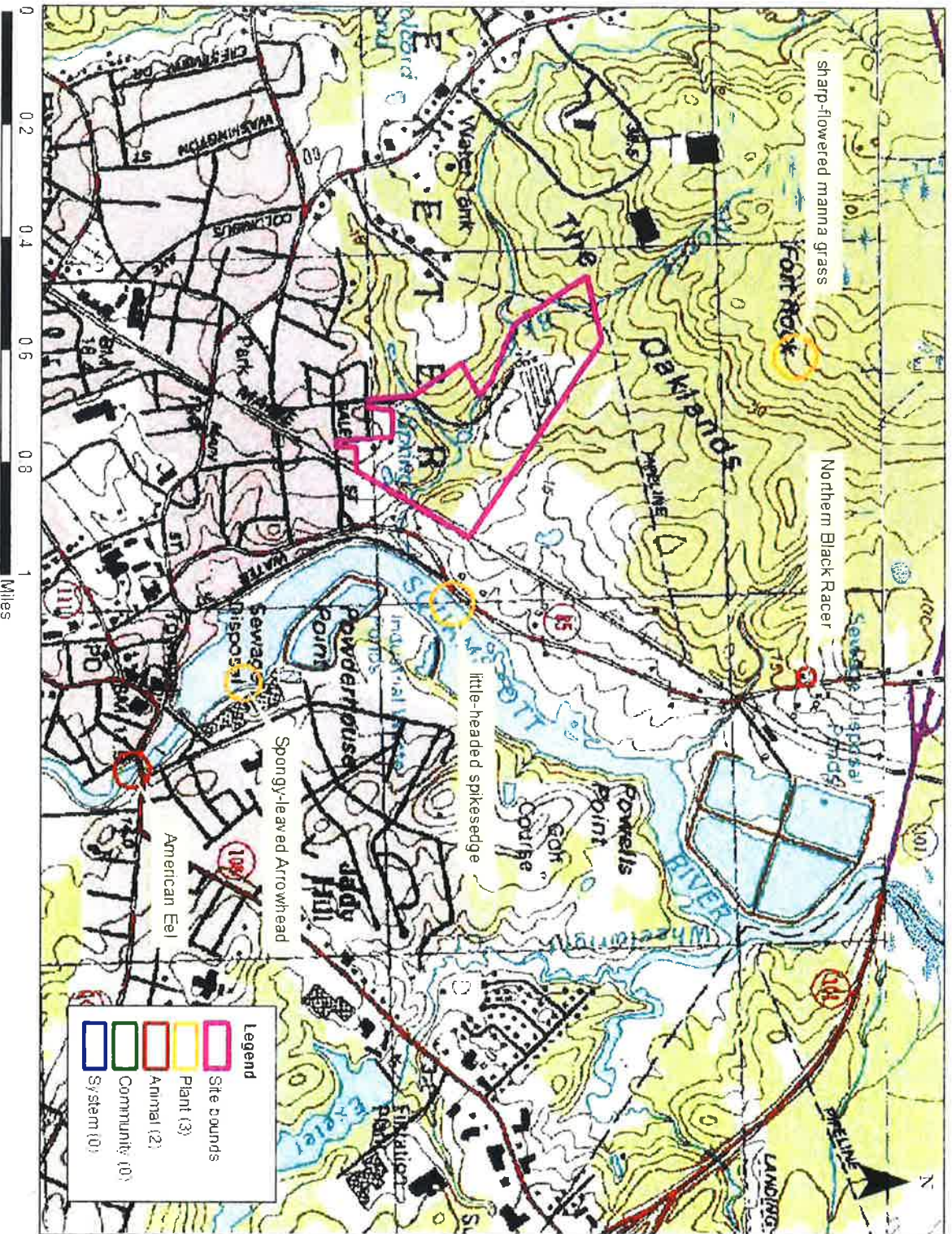
*Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.*

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.

Department of Resources and Economic Development  
Division of Forests and Lands  
(603) 271-2214 fax: 271-6488

DRED/NHB  
172 Pembroke Rd.  
Concord, NH 03301

# NHB16-3245







New Hampshire Natural Heritage Bureau - Plant Record  
**Spongy-leaved Arrowhead (*Sagittaria montevidensis* ssp. *spongiosa*)**

**Legal Status**

Federal: Not listed  
 State: Listed Endangered

**Conservation Status**

Global: Apparently secure but with cause for concern  
 State: Critically imperiled due to rarity or vulnerability

**Description at this Location**

Conservation Rank: Good quality, condition and landscape context ('B' on a scale of A-D).  
 Comments on Rank:

Detailed Description: 2003: Very common (hundreds of plants) in several areas.

General Area: 2003: Tidal brackish marsh with smooth cordgrass (*Spartina alterniflora*), softstem bulrush (*Schoenoplectus tabernaemontani*), and three-square rush (*Schoenoplectus pungens*). In alluvium, with fresh-water cordgrass (*Spartina pectinata*), common arrowhead (*Sagittaria latifolia*), and mild water pepper (*Persicaria hydropiperoides*).

General Comments:

Management

Comments:

**Location**

Survey Site Name: Squamscott River at Exeter  
 Managed By:

County: Rockingham

Town(s): Exeter

Size: 1.9 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2003: 250 m south of Jady Hill Ave. along the east shore of the Squamscott River in Exeter.

**Dates documented**

First reported: 2003-07-25

Last reported: 2003-07-25



## New Hampshire Natural Heritage Bureau - Animal Record

American Eel (*Anguilla rostrata*)**Legal Status**

Federal: Not listed  
State: Special Concern

**Conservation Status**

Global: Apparently secure but with cause for concern  
State: Rare or uncommon

**Description at this Location**

Conservation Rank: Not ranked  
Comments on Rank:

Detailed Description: 2008: Area 13324: 15 observed.

General Area:

General Comments:

Management

Comments:

**Location**

Survey Site Name: Great Brook-Exeter River  
Managed By:

County: Rockingham

Town(s): Exeter

Size: 1.9 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2008: Exeter River

**Dates documented**

First reported: 2008-08-29

Last reported: 2008-08-29

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.



## Wetland Function-Value Evaluation Form

Wetland I.D. Exeter Rose Farm, LLC  
 Latitude N42 59 395' Longitude W70 57 443'  
 Prepared by: MEJ Date 032718  
 Wetland Impact: NA  
 Type: Buffer-Indirect Area

Evaluation based on:  
 Office Yes Field Yes  
 Corps manual wetland delineation completed? Y MEJ N

Total area of wetland 1.9+/- Ac Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No  
 Adjacent land use Apartments-south, SF Residential-north Distance to nearest roadway or other development 0+/- OakStX  
 Dominant wetland systems present PSS / 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? Lower  
 How many tributaries contribute to the wetland? 2 Wildlife & vegetation diversity/abundance (see attached list)

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	6, 7, 12, 13, 14	Y	6 Slowly permeable marine sediments dominant, 7 Norris Bk perennial, 13/14 observed seeps and snow melt
Floodflow Alteration	Y	5,6,9,10,13,14,15,18	Y	15 Culvert at Oak Street Extension partially plugged
Fish and Shellfish Habitat	Y	1,2,4,7,8,10,14,17	N	7 Based upon direct observation only, no testing of water, pollution sources exist on-site
Sediment/Toxicant Retention	Y	1,2,4,6,7,8,10,14,16	Y	2, Site is contaminated, 10 Norris Brook is perennial at this location
Nutrient Removal	Y	3,4,6,7,8,9,10,12,13	Y	4 Former greenhouses, 10 limited
Production Export	Y	1,4,5,7,10,12	N	
Sediment/Shoreline Stabilization	Y	1,2,6,7,8,9,12,13,14	N	
Wildlife Habitat	Y	2,6,7,8,11,13,16,17,19,21	Y	2 Assumed-pollution sources exist, 11 Swamp, 17 deer tracks, south aspect on Oak St Ext side
Recreation	Y	4,5,6,10,12	N	4 Neighbored children possibly (if not on their phones) 6 Water quality looks good. No testing done. Pollution sources east 10 Potential parking near spring
Educational/Scientific Value	Y	5,8,9,14	N	8 Short/small bus/van only, 9 Short drive-Main St School (K-2) closest
Uniqueness/Heritage	N	5,7,8,12,15,17,19,22,27	N	5 Swamp, 12 PSS/PFO, 15 P. Loosestrife, 17 from Oak St.X,
Visual Quality/Aesthetics	N	4,6,8,10,11	N	4 P. Loosestrife-Dominant?
ES Endangered Species Habitat				See attached Natural Heritage Report
Other				

Notes: Refer to backup list of numbered considerations

Western Intermittent Stream (YELLOW)

# Wetland Function-Value Evaluation Form

Wetland I.D. Exeter Rose Farm, LLC  
 Latitude \_\_\_\_\_ Longitude \_\_\_\_\_  
 Prepared by: MEJ Date 032718  
 Wetland Impact Type DIRECT Area 975+/- SF Perm

Total area of wetland 0.42+/- Ac Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No  
 Adjacent land use SF Res-north, Forested and Industrial-South Distance to nearest roadway or other development 0 feet (Gas)  
 Dominant wetland systems present R5UBH 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? Upper-headwater  
 How many tributaries contribute to the wetland? None Wildlife & vegetation diversity/abundance (see attached list)

Evaluation based on:  
 Office Yes Field Yes  
 Corps manual wetland delineation completed? Y MEJ N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	6, 7, 12, 13, 14	Y	<small>6 Slowly permeable soils, 7 Stream IS the wetland, 12 Appears high by direct obs - no testing-pollutants nearby 13/14 Obs. seeps and melted snow</small>
Floodflow Alteration	N	5, 13	N	5 Slowly permeable marine sediments, 13 intermittent stream
Fish and Shellfish Habitat	N	1, 2, 4, 7, 8, 14, 17	N	2, Locally, 8 Dense canopy, 14 Persistent but intermittent
Sediment/Toxicant Retention	N	1, 4, 7, 8, 10	N	1 Stream IS the source periodically, 10 Intermittent
Nutrient Removal	N	7	N	7 marine mineral sediments
Production Export	N	10	N	
Sediment/Shoreline Stabilization	N	1, 2, 4, 5, 8, 9	N	4 Unconsolidated stream bottom a source of sediment
Wildlife Habitat	Y	2, 3, 5, 6, 7, 8	N	<small>2 Direct observation only - no testing 3 Part of larger wetland bisected by gas main access road at property line, 8 Nearby</small>
Recreation	Y	4, 6, 11	N	4 existing unauthorized trails, 6 Assumed-no testing, 11 Especially from gas main ROW
Educational/Scientific Value	Y	2, 4, 10	N	<b>Boulders pose safety hazard?</b>
Uniqueness/Heritage	N	7, 16, 18, 19	N	<b>7-upland corridor, 18 Appears so-no testing</b>
Visual Quality/Aesthetics	Y	6, 7, 10, 11, 12	N	7 Upper portion, 10 Low/steady noise from industrial park
<b>ES</b> Endangered Species Habitat				<b>See Natural Heritage Bureau report</b>
Other				

Notes: \* Refer to backup list of numbered considerations.

Norris Brook - downstream  
(East) of Oak St Ext - to  
Railroad (GREEN)

## Wetland Function-Value Evaluation Form

Wetland I.D. Exeter Rose Farm, LLC  
 Latitude N42 59.328' Longitude W70 57.268'  
 Prepared by: MEJ Date 03/27/18  
 Wetland Impact: 3,163+/- SF Perm  
 Type DIRECT/CROSSING

Total area of wetland 3.34+/- Ac Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No  
 Adjacent land use North-Forest, South-Forest/Grassland/Residential Distance to nearest roadway or other development 0+/- OakStX  
 Dominant wetland systems present PSS & PFO dominant Contiguous undeveloped buffer zone present Predominantly  
 Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Lower  
 How many tributaries contribute to the wetland? 5 Wildlife & vegetation diversity/abundance (see attached list)

Evaluation based on:  
 Office Yes Field Yes  
 Corps manual wetland delineation completed? Y MEJ N     

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	6,7,12,13,14	Y	6 Slowly permeable soils, 7 Norris Bk is perennial, 13/14 Obs. seeps & snow melt
Floodflow Alteration	Y	5,6,9,10,13,14,15,18	Y	15 Less constricted than OakStExt culvert
Fish and Shellfish Habitat	Y	1,2,7,8,10,14,16,17	N	7, Direct obs. only-no testing-pollutants on site
Sediment/Toxicant Retention	Y	1,2,4,6,7,8,10,11,14,16	Y	1 Stream can be sediment source, 2 Site is contaminated, 10 Norris Brook is perennial
Nutrient Removal	Y	3,4,6,7,8,9,10,12,13	Y	4 Former greenhouses, 8 Dense patches
Production Export	Y	1,4,7,10,12	N	7, Large dense patches, 12 P.Loosestrife
Sediment/Shoreline Stabilization	Y	1,2,6,7,8,9,12,13	N	
Wildlife Habitat	Y	2,4,7,8,11,13,14,16,19,21	Y	2 assumed-pollution sources exist, 4 Partially developed, 11 Swamp,
Recreation	Y	4,5,6,10,12	N	4 Neighborhood possibly-no real sign 6 Assumed-pollution sources exist 10 Small bus
Educational/Scientific Value	Y	2,3,5,8,9,11,12,14	N	3 three potential classes, 8 small bus, 9 Short drive, 12 impoundment
Uniqueness/Heritage	Y	4,5,7,8,11,13,19,21,22	Y	5 PSS dominant, 8 Short drive
Visual Quality/Aesthetics	N	2,6,8,11	N	daily passenger trains
ES Endangered Species Habitat				See Natural Heritage Bureau Report
Other				

Notes: \* Refer to backup list of numbered considerations.

# Wetland Function-Value Evaluation Form

Wetland I.D. Exeter Rose Farm, LLC

Latitude \_\_\_\_\_ Longitude \_\_\_\_\_

Prepared by: MEJ Date 03/27/18

Wetland Impact: Type None Area NA

Evaluation based on: Office Yes Field Yes

Corps manual wetland delineation completed? Y MEJ N

Total area of wetland 0.88 +/- Ac Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No

Adjacent land use Forested (Mature and Regrowth) Distance to nearest roadway or other development 450' OakStX

Dominant wetland systems present PFO & PSS Contiguous undeveloped buffer zone present YES

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Mid

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list)

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	6,7,9,12,13,14	Y	6 slowly permeable sediments, 7 Intermittent, 9 Constricted outlet, 13/14 observed seeps
Floodflow Alteration	Y	5,6,7,9,13,15-18	Y	7 Intermittent outlet, 13 Intermittent
Fish and Shellfish Habitat	N	1,7,8,16,17	N	17 Intermittently defined
Sediment/Toxicant Retention	Y	3,4,6,7,8,10,13,16	N	3 Limited opportunity, 10 Intermittent,
Nutrient Removal	N	7,8,9,13	N	9 Woody stems
Production Export	N	1,7,12	N	7 Patchy, 12 Dogwood
Sediment/Shoreline Stabilization	N	1,2,9,13	N	1 Especially below constriction, 13 shrubs
Wildlife Habitat	Y	1,2,4,7,8,13,21	N	1 old woods road, 2 assumed, 21 Potential
Recreation	Y	4,6,11	N	4 Neighborhood mostly-bike trails, 6 Assumed-no testing
Educational/Scientific Value	Y	2,4,5,10,11-13	N	4 mostly natural 13 Railroad?
Uniqueness/Heritage	N	7,10,16,18,19,22	N	10 Railroad? 18 Assumed
Visual Quality/Aesthetics	N	7,10,11	N	10 Railroad?
ES Endangered Species Habitat				Refer to attached report from Natural Heritage Bureau
Other				

Notes: \* Refer to backup list of numbered considerations.



# Appendix A

## Wetland evaluation supporting documentation; Reproducible forms.

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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.
16. Other



**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.<sup>1</sup>

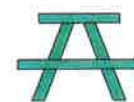
#### CONSIDERATIONS/QUALIFIERS

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

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<sup>1</sup>In 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.



Marc E. Jacobs, CSS, CWS, PWS, CPESC  
Professional Wetland / Soil Scientist  
[jacobs2wetsoil2004@yahoo.com](mailto:jacobs2wetsoil2004@yahoo.com)

Via First Class Mail

September 16, 2021

Mr. Eben Lewis  
N.H. Dept. of Environmental Services  
Land Resources Management – Wetlands Bureau  
Pease Tradeport  
222 International Drive, Suite 175  
Portsmouth, N.H. 03801

Re: **Exeter Rose Farm, LLC**  
**Oak Street Extension**  
**Assessors Map 54, Lots 5-7 and Map 63, Lot 205**  
**Exeter, NH**

Dear Mr. Lewis,

A wetland functional assessment (WFA) was conducted for the above-referenced project in 2018 using the U.S. Army Corps Highway Methodology. As you know, new rules were promulgated by the Wetlands Bureau in 2019. Those rules include the need for a WFA. However, the WFA must also address the ecological integrity function which the highway methodology does not include. The information identified below and attached to this letter is therefore intended to supplement the WFA dated April 3, 2018 as needed to comply with the new rules.

- Ecological Integrity data form\* and Wetland Functional Assessment Worksheet for the yellow study area
- Ecological Integrity data form\* and Wetland Functional Assessment Worksheet for the blue study area
- Ecological Integrity data form\* and Wetland Functional Assessment Worksheet for the green study area
- Ecological Integrity data form\* and Wetland Functional Assessment Worksheet for the red study area
- 2018 Aerial image w/500 radius circle
- Potentially contaminated sites locus
- Stream Stats locus

Below is a revised Table which summarizes the findings of these additional investigations.



Cordially,

Marc Jacobs, CWS, CSS, CPESC

**Table 1. Summary of Principal Functions and Values**

Wetland Study Area	Ecological Integrity	Groundwater Recharge/Discharge	Floodflow Alteration	Fish/Shellfish Habitat	Sediment/Toxicant Retention	Nutrient Removal	Production Export	Sediment/Shoreline Stabilization	Wetland Wildlife Habitat	Recreation	Educate/Scientific Value	Uniqueness/Heritage	Visual Quality/Aesthetics	Endangered/Threatened Species Habitat	Total Number of Principal Functions by Study Area
Green	N	Y	Y	N	Y	Y	N	N	Y	N	N	Y	N	N	6
Yellow	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	2
Red	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	3
Blue	N	Y	Y	N	Y	Y	N	N	Y	N	N	N	N	N	5

\*From the Method for Inventorying and Evaluating Freshwater Wetlands in NH



# NH METHOD FOR THE EVALUATION OF FRESHWATER WETLANDS *(revised December, 2015)*

Wetland Name/Code: Rose Farm-Yellow Study Area Evaluation Date: April 2, 2021 Evaluator: Marc Jacobs, CWS

## 1 – ECOLOGICAL INTEGRITY

Evaluation Questions	Observations & Notes	Answers	Score
<b>1. Are there land uses in the wetland's watershed that could degrade water quality in the wetland?</b> eroding road banks/ditches, const. sites, impervious surf., such as roads/parking lots/industrial parks/airports/land fills, active cropland & areas w/little or no vegetation	Subject is a listed remediation site. Numerous other haz waste and remediation sites as well as industrial park in the watershed.	a. Less than 5% of the watershed has land uses that could degrade water quality. b. 5-10% of the watershed has land uses that could degrade water quality. c. > 10% of the watershed has land uses that could degrade water quality.	10 5 ①
<b>2. Is there evidence of fill in the wetland?</b> railroads, borrow pits, transportation, residential, comm., or industrial development	Some fill/alteration at southern tip of study area. Gas pipeline crosses stream just above site.	a. Less than 1 % b. From 1-3 % c. More than 3 %	⑩ 5 1
<b>3. What percentage of the wetland has been altered by agricultural activities?</b> pastures, mowed areas, agricultural drainage ditches	No evidence of agricultural activity in wetland. Site was former brick yard then commercial greenhouses.	a. Less than 5 % b. From 5 to 25 % c. More than 25 %	⑩ 5 1
<b>4. What percentage of the wetland has been adversely impacted by logging activity within the last 10 years?</b> logging roads, rutting, altered hydrology, sedimentation	No evidence of logging in last 10 years.	a. Less than 1% b. From 1 to 10 % c. More than 10 %	⑩ 5 1
<b>5. How much human activity is taking place in the wetland (e.g. ATV use, trails, cars, dumping of brush and garbage, etc.)? other than agriculture &amp; logging</b>	Active mountain bike trail exists.	a. Low: Few trails in use, little or no traffic, and little or no litter. b. Moderate: Some used trails, roads, litter c. High: Many trails, roads, and/or litter	⑩ 5 1
<b>6. What percentage of the wetland is occupied by invasive plant species?</b>	Some glossy buckthorn present.	a. None b. 1-5% of the wetland has invasive species c. > 5% of the wetland has invasive species	10 ⑤ 1
<b>7. Are there roads, driveways and/or railroads crossing or adjacent to the wetland or come within 500 ft. of the wetland?</b> inc. roads at the edges of AOI	Oak Street Extension and gravel road w/in pipeline ROW	a. No roads, driveways or railroads. within 500 ft. of, or in the wetland b. Roads, driveways, railroads are within 500 ft of the wetland c. Roads, driveways, railroads cross, or are adjacent to, the wetland	10 ⑤ 1
<b>8. How much human activity is taking place in the upland within 500 feet of the wetland edge?</b> land dist., clearing, logging, active trails, development, roads	Active bike trail, gravel road	a. Less than 5% or no activity b. Human activity evident in up to 25% of the 500 ft zone c. Human activity evident in more than 25% of the 500 ft zone	⑩ 5 1
<b>9. What is the percent of impervious surface within 500 feet of the wetland edge?</b>	Estimated	a. Less than 3% impervious area within 500 ft of the wetland edge b. 3-10% impervious area within 500 ft of the wetland edge c. Greater than 10% impervious area within 500 ft of the wetland edge	⑩ 5 1
<b>10. Is there a human-made structure that regulates the flow of water through the wetland?</b> W/IN 1/2 MILE dams, bridge abutments, culverts, roads exc beaver dams	perched culvert	a. No human made structures present <b>upstream of, or in</b> the wetland. b. One or more human made structures present <b>upstream of, or in</b> the wetland but hydrologic modification is slight c. One or more human made structures present <b>upstream of, or in</b> the wetland that severely block or alter surface water hydrology	10 5 ①

**AVERAGE SCORE FOR ECOLOGICAL INTEGRITY**  
 (Add scores for each question and divide by 10)

72/10 = 7.2



# WETLANDS FUNCTIONAL ASSESSMENT WORKSHEET

Water Division/Land Resource Management  
Wetlands Bureau



[Check the Status of your Application](#)

**RSA/Rule:** RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

**APPLICANT LAST NAME, FIRST NAME, M.I.:** Exeter Rose Farm, LLC

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the [Coastal Area Worksheet \(NHDES-W-06-079\)](#) for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the [Avoidance and Minimization Written Narrative \(NHDES-W-06-089\)](#) and the [Avoidance and Minimization Checklist \(NHDES-W-06-050\)](#) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached to the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

<b>SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)</b>	
ADJACENT LAND USE: Forested Conservation/Open Space, Sparse Single-family Residential, Multi-family Comm. Condo, Gas pipeline, Hazardous contamination	
CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): 50-yellow stdy area	
<b>SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)</b>	
CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Marc E. Jacobs	
DATE(S) OF SITE VISIT(S): 2015-2021	DELINEATION PER ENV-WT 406 COMPLETED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
CONFIRM THAT THE EVALUATION IS BASED ON: <input checked="" type="checkbox"/> Office and <input checked="" type="checkbox"/> Field examination.	
METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in blank if "other"): <input checked="" type="checkbox"/> USACE Highway Methodology. <input type="checkbox"/> Other scientifically supported method (enter name/ title):	

[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147  
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<b>SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)</b>	
WETLAND ID: Yellow Study Area	LOCATION: (LAT/ LONG) 42.989487°N/70.954283°W
WETLAND AREA: 0.42 acres	DOMINANT WETLAND SYSTEMS PRESENT: Int. Stream
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? One	COWARDIN CLASS: R4UBJ
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No if not, where does the wetland lie in the drainage basin?	IS THE WETLAND PART OF: <input checked="" type="checkbox"/> A wildlife corridor or <input type="checkbox"/> A habitat island?  IS THE WETLAND HUMAN-MADE? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	ARE VERNAL POOLS PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If yes, complete the Vernal Pool Table)
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PROPOSED WETLAND IMPACT TYPE: possible future trail	PROPOSED WETLAND IMPACT AREA: TBD

**SECTION 4 - WETLANDS FUNCTIONS AND VALUES (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)**

The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:

1. Ecological Integrity (from RSA 482-A:2, XI)
2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value)
3. Fish & Aquatic Life Habitat (from USACE Highway Methodology: Fish & Shellfish Habitat)
4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration)
5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge)
6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat)
7. Nutrient Trapping/Retention & Transformation (from USACE Highway Methodology: Nutrient Removal)
8. Production Export (Nutrient) (from USACE Highway Methodology)
9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics)
10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention)
11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization)
12. Uniqueness/Heritage (from USACE Highway Methodology)
13. Wetland-based Recreation (from USACE Highway Methodology: Recreation)
14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat)

First, determine if a wetland is suitable for a particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE *The Highway Methodology Workbook Supplement*. Second, indicate which functions and values are principal ("Principal Function/value?" column). As described in *The Highway Methodology Workbook Supplement*, "functions and values can be 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". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
13	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
14	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	

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**SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)**

Delineations of vernal pools shall be based on the characteristics listed in the definition of “vernal pool” in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3<sup>rd</sup> Ed.*, 2016, published by the New Hampshire Fish and Game Department; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

“Important Notes” are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE “Vernal Pool Assessment” form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1					
2					
3					
4					
5					

**SECTION 6 - STREAM RESOURCES SUMMARY**

DESCRIPTION OF STREAM: Intermittent	STREAM TYPE (ROSGEN): A6
HAVE FISHERIES BEEN DOCUMENTED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	DOES THE STREAM SYSTEM APPEAR STABLE? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OTHER KEY ON-SITE FUNCTIONS OF NOTE: NA

The following table can be used to compile data on stream resources. “Important Notes” are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	NH Method, Ecological Integrity form	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Score = 7.2
2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2,4,10	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached Functional Assessment Report and data forms dated 04/03/18
3	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1,2,4,7,8,14,17	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
4	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5,13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
5	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6,7,12,13,14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
6	<input type="checkbox"/> Yes <input type="checkbox"/> No	See NHB Report	<input type="checkbox"/> Yes <input type="checkbox"/> No	See attached
7	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
8	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	10	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
9	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6,7,10,11,12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
10	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1,4,7,8,10	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1,2,4,5,8,9	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7,16,18,19	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4,6,11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2,3,5,6,7,8	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached

**SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)**

- Wildlife and vegetation diversity/abundance list.
- Photograph of wetland.
- Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.
- For projects in tidal areas only: additional information required by Env-Wt 603.03/603.04. Please refer to the Coastal Area Worksheet (NHDES-W-06-079) for more information.

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# NH METHOD FOR THE EVALUATION OF FRESHWATER WETLANDS *(revised December, 2015)*

Wetland Name/Code: Rose Farm - Blue Study Area Evaluation Date: April 2, 2021 Evaluator: Marc Jacobs, CWS

## 1 – ECOLOGICAL INTEGRITY

Evaluation Questions	Observations & Notes	Answers	Score
<b>1. Are there land uses in the wetland's watershed that could degrade water quality in the wetland?</b> eroding road banks/ditches, const. sites, impervious surf., such as roads/parking lots/industrial parks/airports/land fills, active cropland & areas w/little or no vegetation	Subject site is a known remediation site. Numerous other haz waste & remediation sites as well as an Industrial Park exist in the Norris Brook watershed.	a. Less than 5% of the watershed has land uses that could degrade water quality. b. 5-10% of the watershed has land uses that could degrade water quality. c. > 10% of the watershed has land uses that could degrade water quality.	10 5 ①
<b>2. Is there evidence of fill in the wetland?</b> railroads, borrow pits, transportation, residential, comm., or industrial development	Solid waste and hazardous coal ash fill exist in the wetland and are subject to a remediation plan	a. Less than 1 % b. From 1-3 % c. More than 3 %	10 ⑤ 1
<b>3. What percentage of the wetland has been altered by agricultural activities?</b> pastures, mowed areas, agricultural drainage ditches	An irrigation basin has been excavated immediately adjacent.	a. Less than 5 % b. From 5 to 25 % c. More than 25 %	10 ⑤ 1
<b>4. What percentage of the wetland has been adversely impacted by logging activity within the last 10 years?</b>	No apparent logging activity observed.	a. Less than 1% b. From 1 to 10 % c. More than 10 %	⑩ 5 1
<b>5. How much human activity is taking place in the wetland (e.g. ATV use, trails, cars, dumping of brush and garbage, etc.)? other than agriculture &amp; logging</b>	Some garbage and brush from nearby homes.	a. Low: Few trails in use, little or no traffic, and little or no litter. b. Moderate: Some used trails, roads, litter c. High: Many trails, roads, and/or litter	10 ⑤ 1
<b>6. What percentage of the wetland is occupied by invasive plant species?</b>	Purple loosestrife & Glossy buckthorn	a. None b. 1-5% of the wetland has invasive species c. > 5% of the wetland has invasive species	10 ⑤ 1
<b>7. Are there roads, driveways and/or railroads crossing or adjacent to the wetland or come within 500 ft. of the wetland?</b> inc. roads at the edges of AOI	Oak Street Extension bisects the wetland complex and continues parallel to the blue study area for a considerable distance w/in 500-feet.	a. No roads, driveways or railroads. within 500 ft. of, or in the wetland b. Roads, driveways, railroads are within 500 ft of the wetland c. Roads, driveways, railroads cross, or are adjacent to, the wetland	10 5 ①
<b>8. How much human activity is taking place in the upland within 500 feet of the wetland edge?</b> land dist., clearing, logging, active trails, development, roads	There are numerous residential homes within 500-feet.	a. Less than 5% or no activity b. Human activity evident in up to 25% of the 500 ft zone c. Human activity evident in more than 25% of the 500 ft zone	10 5 ①
<b>9. What is the percent of impervious surface within 500 feet of the wetland edge?</b>	Estimated	a. Less than 3% impervious area within 500 ft of the wetland edge b. 3-10% impervious area within 500 ft of the wetland edge c. Greater than 10% impervious area within 500 ft of the wetland edge	10 ⑤ 1
<b>10. Is there a human-made structure that regulates the flow of water through the wetland?</b> W/IN 1/2 MILE dams, bridge abutments, culverts, roads exc beaver dams	Existing culvert at Oak Street Extension acts as a dam during storms and occasionally causes Norris Brook to overtop the road.	a. No human made structures present <b>upstream of, or in</b> the wetland. b. One or more human made structures present <b>upstream of, or in</b> the wetland but hydrologic modification is slight c. One or more human made structures present <b>upstream of, or in</b> the wetland that severely block or alter surface water hydrology	10 5 ①

### AVERAGE SCORE FOR ECOLOGICAL INTEGRITY

(Add scores for each question and divide by 10)

39/10 = 3.9



# WETLANDS FUNCTIONAL ASSESSMENT WORKSHEET

Water Division/Land Resource Management  
Wetlands Bureau



[Check the Status of your Application](#)

**RSA/Rule:** RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

**APPLICANT LAST NAME, FIRST NAME, M.I.:** Exeter Rose Farm, LLC

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the [Coastal Area Worksheet \(NHDES-W-06-079\)](#) for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the [Avoidance and Minimization Written Narrative \(NHDES-W-06-089\)](#) and the [Avoidance and Minimization Checklist \(NHDES-W-06-050\)](#) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached to the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

<b>SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)</b>	
ADJACENT LAND USE: Commercial Multi-family residential, Sparse single-family residential, Hazardous contamination	
CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): 0-blue study area	
<b>SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)</b>	
CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Marc E. Jacobs	
DATE(S) OF SITE VISIT(S): 2015-2021	DELINEATION PER ENV-WT 406 COMPLETED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
CONFIRM THAT THE EVALUATION IS BASED ON:	
<input checked="" type="checkbox"/> Office and	
<input checked="" type="checkbox"/> Field examination.	
METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in blank if "other"):	
<input checked="" type="checkbox"/> USACE Highway Methodology.	
<input type="checkbox"/> Other scientifically supported method (enter name/ title):	



<b>SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)</b>	
WETLAND ID: Blue Study Area	LOCATION: (LAT/ LONG) 42.989648°N/70.957290°W
WETLAND AREA: 1.9 acres on site	DOMINANT WETLAND SYSTEMS PRESENT: Forested
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? 2 on site	COWARDIN CLASS: PFO/PSS
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No if not, where does the wetland lie in the drainage basin? Low	IS THE WETLAND PART OF: <input checked="" type="checkbox"/> A wildlife corridor or <input type="checkbox"/> A habitat island?  IS THE WETLAND HUMAN-MADE? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	ARE VERNAL POOLS PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If yes, complete the Vernal Pool Table)
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/DOWNGRADIENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PROPOSED WETLAND IMPACT TYPE: Culvert replacement	PROPOSED WETLAND IMPACT AREA: 202 SF
<b>SECTION 4 - WETLANDS FUNCTIONS AND VALUES (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)</b>	
<p>The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:</p> <ol style="list-style-type: none"> <li>1. Ecological Integrity (from RSA 482-A:2, XI)</li> <li>2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value)</li> <li>3. Fish &amp; Aquatic Life Habitat (from USACE Highway Methodology: Fish &amp; Shellfish Habitat)</li> <li>4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration)</li> <li>5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge)</li> <li>6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat)</li> <li>7. Nutrient Trapping/Retention &amp; Transformation (from USACE Highway Methodology: Nutrient Removal)</li> <li>8. Production Export (Nutrient) (from USACE Highway Methodology)</li> <li>9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics)</li> <li>10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention)</li> <li>11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization)</li> <li>12. Uniqueness/Heritage (from USACE Highway Methodology)</li> <li>13. Wetland-based Recreation (from USACE Highway Methodology: Recreation)</li> <li>14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat)</li> </ol> <p>First, determine if a wetland is suitable for a particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE <i>The Highway Methodology Workbook Supplement</i>. Second, indicate which functions and values are principal ("Principal Function/value?" column). As described in <i>The Highway Methodology Workbook Supplement</i>, "functions and values can be 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". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.</p>	

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	NH Method, Ecological Integrity Data Form	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Score = 3.9
2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5,8,9,14	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached Functional Assessment and data forms dated April 3, 2018
3	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,4,7,8,19,14,17	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5,6,9,10,13,14,15,18	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
5	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6,7,12,13,14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
6	<input type="checkbox"/> Yes <input type="checkbox"/> No	See NHB report	<input type="checkbox"/> Yes <input type="checkbox"/> No	See attached
7	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3,4,6,7,8,9,10,12,13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
8	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,4,5,7,10,12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
9	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4,6,8,10,11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,4,6,7,8,10,14,16	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,6,7,8,9,12,13,14	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5,12,15,17,19,22,27	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4,5,6,10,12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2,6,7,8,11,13,16,17,19,21	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached

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**SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)**

Delineations of vernal pools shall be based on the characteristics listed in the definition of “vernal pool” in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3<sup>rd</sup> Ed.*, 2016, published by the New Hampshire Fish and Game Department; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

“Important Notes” are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE “Vernal Pool Assessment” form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1					
2					
3					
4					
5					

**SECTION 6 - STREAM RESOURCES SUMMARY**

DESCRIPTION OF STREAM: Perennial

STREAM TYPE (ROSGEN): E

HAVE FISHERIES BEEN DOCUMENTED?

Yes  No

DOES THE STREAM SYSTEM APPEAR STABLE?

Yes  No

OTHER KEY ON-SITE FUNCTIONS OF NOTE: Possible American eel?

The following table can be used to compile data on stream resources. “Important Notes” are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
13	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
14	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	

**SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)**

- Wildlife and vegetation diversity/abundance list.
- Photograph of wetland.
- Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.
- For projects in tidal areas only: additional information required by Env-Wt 603.03/603.04. Please refer to the Coastal Area Worksheet (NHDES-W-06-079) for more information.

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# NH METHOD FOR THE EVALUATION OF FRESHWATER WETLANDS *(revised December, 2015)*

Wetland Name/Code: Rose Farm - Green Study Area Evaluation Date: April 2, 2021 Evaluator: Marc Jacobs, CWS

## 1 – ECOLOGICAL INTEGRITY

Evaluation Questions	Observations & Notes	Answers	Score
<b>1. Are there land uses in the wetland's watershed that could degrade water quality in the wetland?</b> eroding road banks/ditches, const. sites, impervious surf., such as roads/parking lots/industrial parks/airports/land fills, active cropland & areas w/little or no vegetation	Area is a known remediation site. Numerous haz waste & remediation sites as well as industrial park w/in watershed.	a. Less than 5% of the watershed has land uses that could degrade water quality. b. 5-10% of the watershed has land uses that could degrade water quality. c. > 10% of the watershed has land uses that could degrade water quality.	10 5 ①
<b>2. Is there evidence of fill in the wetland?</b> railroads, borrow pits, transportation, residential, comm., or industrial development	Railroad at edge of study area. Dredge spoils from man-made pond deposited in wetland.	a. Less than 1 % b. From 1-3 % c. More than 3 %	10 5 ①
<b>3. What percentage of the wetland has been altered by agricultural activities?</b> pastures, mowed areas, agricultural drainage ditches	Little evidence of agriculture in wetland with the exception of two man-made irrigation ponds.	a. Less than 5 % b. From 5 to 25 % c. More than 25 %	10 ⑤ 1
<b>4. What percentage of the wetland has been adversely impacted by logging activity within the last 10 years?</b> logging roads, rutting, altered hydrology, sedimentation	No apparent logging activity in wetland.	a. Less than 1% b. From 1 to 10 % c. More than 10 %	⑩ 5 1
<b>5. How much human activity is taking place in the wetland (e.g. ATV use, trails, cars, dumping of brush and garbage, etc.)? other than agriculture &amp; logging</b>	Minor amounts of brush and garbage.	a. Low: Few trails in use, little or no traffic, and little or no litter. b. Moderate: Some used trails, roads, litter c. High: Many trails, roads, and/or litter	⑩ 5 1
<b>6. What percentage of the wetland is occupied by invasive plant species?</b>	Purple loosestrife and Glossy buckthorn. Large population of Japanese knotweed along edge.	a. None b. 1-5% of the wetland has invasive species c. > 5% of the wetland has invasive species	10 ⑤ 1
<b>7. Are there roads, driveways and/or railroads crossing or adjacent to the wetland or come within 500 ft. of the wetland?</b> inc. roads at the edges of AOI	Oak Street Extension bisects complex. Active railroad along edge. Forest Street w/in 500-feet.	a. No roads, driveways or railroads. within 500 ft. of, or in the wetland b. Roads, driveways, railroads are within 500 ft of the wetland c. Roads, driveways, railroads cross, or are adjacent to, the wetland	10 5 ①
<b>8. How much human activity is taking place in the upland within 500 feet of the wetland edge?</b> land dist., clearing, logging, active trails, development, roads	Significant residential development and numerous mountain biking trails.	a. Less than 5% or no activity b. Human activity evident in up to 25% of the 500 ft zone c. Human activity evident in more than 25% of the 500 ft zone	10 ⑤ 1
<b>9. What is the percent of impervious surface within 500 feet of the wetland edge?</b>	Estimate	a. Less than 3% impervious area within 500 ft of the wetland edge b. 3-10% impervious area within 500 ft of the wetland edge c. Greater than 10% impervious area within 500 ft of the wetland edge	10 ⑤ 1
<b>10. Is there a human-made structure that regulates the flow of water through the wetland?</b> <b>W/IN 1/2 MILE</b> dams, bridge abutments, culverts, roads exc beaver dams	Undersized culvert at upstream edge and box culvert beneath railroad at downstream edge. Concrete spillway/weir impounds man-made pond.	a. No human made structures present <b>upstream of, or in</b> the wetland. b. One or more human made structures present <b>upstream of, or</b> in the wetland but hydrologic modification is slight c. One or more human made structures present <b>upstream of, or</b> in the wetland that severely block or alter surface water hydrology	10 5 ①

**AVERAGE SCORE FOR ECOLOGICAL INTEGRITY**  
 (Add scores for each question and divide by 10)

45/10 = 4.5



# WETLANDS FUNCTIONAL ASSESSMENT WORKSHEET

Water Division/Land Resource Management  
Wetlands Bureau



[Check the Status of your Application](#)

**RSA/Rule:** RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

**APPLICANT LAST NAME, FIRST NAME, M.I.:** Exeter Rose Farm, LLC

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the [Coastal Area Worksheet \(NHDES-W-06-079\)](#) for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the [Avoidance and Minimization Written Narrative \(NHDES-W-06-089\)](#) and the [Avoidance and Minimization Checklist \(NHDES-W-06-050\)](#) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached to the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

<b>SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)</b>	
ADJACENT LAND USE: Single Family Residential, Active Railroad, Active Spring	
CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): 0-green study area	
<b>SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)</b>	
CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Marc E. Jacobs	
DATE(S) OF SITE VISIT(S): 2015-2021	DELINEATION PER ENV-WT 406 COMPLETED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
CONFIRM THAT THE EVALUATION IS BASED ON: <input checked="" type="checkbox"/> Office and <input checked="" type="checkbox"/> Field examination.	
METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in blank if "other"): <input checked="" type="checkbox"/> USACE Highway Methodology. <input type="checkbox"/> Other scientifically supported method (enter name/ title):	

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<b>SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)</b>	
WETLAND ID: Green Study Area	LOCATION: (LAT/ LONG) 42.988643°N/70.954436°W
WETLAND AREA: 3.34 +/- acres	DOMINANT WETLAND SYSTEMS PRESENT: Forested
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? 3+	COWARDIN CLASS: PFO, PSS, POW (man-made pond)
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No if not, where does the wetland lie in the drainage basin?	IS THE WETLAND PART OF: <input checked="" type="checkbox"/> A wildlife corridor or <input type="checkbox"/> A habitat island?  IS THE WETLAND HUMAN-MADE? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE VERNAL POOLS PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If yes, complete the Vernal Pool Table)
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PROPOSED WETLAND IMPACT TYPE: 2 culverts, weir rehab	PROPOSED WETLAND IMPACT AREA: 3163+1132+584 SF

**SECTION 4 - WETLANDS FUNCTIONS AND VALUES (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)**

The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:

1. Ecological Integrity (from RSA 482-A:2, XI)
2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value)
3. Fish & Aquatic Life Habitat (from USACE Highway Methodology: Fish & Shellfish Habitat)
4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration)
5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge)
6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat)
7. Nutrient Trapping/Retention & Transformation (from USACE Highway Methodology: Nutrient Removal)
8. Production Export (Nutrient) (from USACE Highway Methodology)
9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics)
10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention)
11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization)
12. Uniqueness/Heritage (from USACE Highway Methodology)
13. Wetland-based Recreation (from USACE Highway Methodology: Recreation)
14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat)

First, determine if a wetland is suitable for a particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE *The Highway Methodology Workbook Supplement*. Second, indicate which functions and values are principal ("Principal Function/value?" column). As described in *The Highway Methodology Workbook Supplement*, "functions and values can be 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". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.

FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	NH Method	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Score = 4.5, See attached Ecological Integrity data form
2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2,3,5,8,9,11,12,14	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached Functional Assessment and data forms dated April 3, 2018
3	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,7,8,10,14,16,17	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5,6,9,10,13,14,15,18	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
5	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6,7,12,13,14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
6	<input type="checkbox"/> Yes <input type="checkbox"/> No	See NHB report	<input type="checkbox"/> Yes <input type="checkbox"/> No	See attached
7	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3,4,6,7,8,9,10,12,13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
8	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,4,7,10,12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
9	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2,6,8,11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,4,6,7,8,10,11,14,16	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,6,7,8,9,12,13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4,5,7,8,11,13,19,21,22	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4,5,6,10,12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2,4,7,8,11,14,16,19,21	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

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**SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)**

Delineations of vernal pools shall be based on the characteristics listed in the definition of “vernal pool” in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3<sup>rd</sup> Ed.*, 2016, published by the New Hampshire Fish and Game Department; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

“Important Notes” are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE “Vernal Pool Assessment” form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1					
2					
3					
4					
5					

**SECTION 6 - STREAM RESOURCES SUMMARY**

DESCRIPTION OF STREAM: Perennial	STREAM TYPE (ROSGEN): E
HAVE FISHERIES BEEN DOCUMENTED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	DOES THE STREAM SYSTEM APPEAR STABLE? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

OTHER KEY ON-SITE FUNCTIONS OF NOTE: Possible American eel

The following table can be used to compile data on stream resources. “Important Notes” are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
13	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
14	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	

**SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)**

- Wildlife and vegetation diversity/abundance list.
- Photograph of wetland.
- Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.
- For projects in tidal areas only: additional information required by Env-Wt 603.03/603.04. Please refer to the Coastal Area Worksheet (NHDES-W-06-079) for more information.

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# NH METHOD FOR THE EVALUATION OF FRESHWATER WETLANDS *(revised December, 2015)*

Wetland Name/Code: Rose Farm-Red Study Area Evaluation Date: April 2, 2021 Evaluator: Marc Jacobs, CWS

## 1 – ECOLOGICAL INTEGRITY

Evaluation Questions	Observations & Notes	Answers	Score
<b>1. Are there land uses in the wetland's watershed that could degrade water quality in the wetland?</b> eroding road banks/ditches, const. sites, impervious surf., such as roads/parking lots/industrial parks/airports/land fills, active cropland & areas w/little or no vegetation	Portions of site are subject to a Remedial Action Plan for lead and coal ash. No other known haz waste or remediation sites in this watershed.	a. Less than 5% of the watershed has land uses that could degrade water quality. b. 5-10% of the watershed has land uses that could degrade water quality. c. > 10% of the watershed has land uses that could degrade water quality.	(10) 5 1
<b>2. Is there evidence of fill in the wetland?</b> railroads, borrow pits, transportation, residential, comm., or industrial development	Evidence of an old gravel road crossing, mostly at grade, but causing erosion, observed.	a. Less than 1 % b. From 1-3 % c. More than 3 %	(10) 5 1
<b>3. What percentage of the wetland has been altered by agricultural activities?</b> pastures, mowed areas, agricultural drainage ditches	Portions of this wetland were historically cleared but have reverted to dense shrubs.	a. Less than 5 % b. From 5 to 25 % c. More than 25 %	(10) 5 1
<b>4. What percentage of the wetland has been adversely impacted by logging activity within the last 10 years?</b>	No recent logging activity.	a. Less than 1% b. From 1 to 10 % c. More than 10 %	(10) 5 1
<b>5. How much human activity is taking place in the wetland (e.g. ATV use, trails, cars, dumping of brush and garbage, etc.)? other than agriculture &amp; logging</b>	Active mountain bike trails.	a. Low: Few trails in use, little or no traffic, and little or no litter. b. Moderate: Some used trails, roads, litter c. High: Many trails, roads, and/or litter	(10) 5 1
<b>6. What percentage of the wetland is occupied by invasive plant species?</b>	Common buckthorn	a. None b. 1-5% of the wetland has invasive species c. > 5% of the wetland has invasive species	10 (5) 1
<b>7. Are there roads, driveways and/or railroads crossing or adjacent to the wetland or come within 500 ft. of the wetland?</b> inc. roads at the edges of AOI	Oak Street Extension - 400' away. Active railroad.	a. No roads, driveways or railroads. within 500 ft. of, or in the wetland b. Roads, driveways, railroads are within 500 ft of the wetland c. Roads, driveways, railroads cross, or are adjacent to, the wetland	10 (5) 1
<b>8. How much human activity is taking place in the upland within 500 feet of the wetland edge?</b> land dist., clearing, logging, active trails, development, roads	Minimal with exception of the railroad.	a. Less than 5% or no activity b. Human activity evident in up to 25% of the 500 ft zone c. Human activity evident in more than 25% of the 500 ft zone	(10) 5 1
<b>9. What is the percent of impervious surface within 500 feet of the wetland edge?</b>	Estimate	a. Less than 3% impervious area within 500 ft of the wetland edge b. 3-10% impervious area within 500 ft of the wetland edge c. Greater than 10% impervious area within 500 ft of the wetland edge	(10) 5 1
<b>10. Is there a human-made structure that regulates the flow of water through the wetland?</b> W/IN 1/2 MILE dams, bridge abutments, culverts, roads exc beaver dams	The remnant woods road	a. No human made structures present <b>upstream of, or in</b> the wetland. b. One or more human made structures present <b>upstream of, or in</b> the wetland but hydrologic modification is slight c. One or more human made structures present <b>upstream of, or in</b> the wetland that severely block or alter surface water hydrology	10 (5) 1

**AVERAGE SCORE FOR ECOLOGICAL INTEGRITY**  
 (Add scores for each question and divide by 10)

85/10 = 8.5



# WETLANDS FUNCTIONAL ASSESSMENT WORKSHEET

Water Division/Land Resource Management  
Wetlands Bureau



[Check the Status of your Application](#)

**RSA/Rule:** RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

**APPLICANT LAST NAME, FIRST NAME, M.I.:** Exeter Rose Farm, LLC

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the [Coastal Area Worksheet \(NHDES-W-06-079\)](#) for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the [Avoidance and Minimization Written Narrative \(NHDES-W-06-089\)](#) and the [Avoidance and Minimization Checklist \(NHDES-W-06-050\)](#) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached to the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

**SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)**

ADJACENT LAND USE: Forested Conservation/Open Space, Sparse Single-family Residential and Active Railroad

CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT?  Yes  No

DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): 400+ red study area

**SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)**

CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Marc E. Jacobs

DATE(S) OF SITE VISIT(S): 2015-2021

DELINEATION PER ENV-WT 406 COMPLETED?  Yes  No

CONFIRM THAT THE EVALUATION IS BASED ON:

- Office and
- Field examination.

METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in blank if "other"):

- USACE Highway Methodology.
- Other scientifically supported method (enter name/ title):

[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147

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<b>SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)</b>	
WETLAND ID: Red Study Area	LOCATION: (LAT/ LONG) 42.989570°N/70.954286°W
WETLAND AREA: 0.88 acres	DOMINANT WETLAND SYSTEMS PRESENT: Forest&Shrub
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? 1	COWARDIN CLASS: PFO & PSS
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No if not, where does the wetland lie in the drainage basin?	IS THE WETLAND PART OF: <input checked="" type="checkbox"/> A wildlife corridor or <input type="checkbox"/> A habitat island?  IS THE WETLAND HUMAN-MADE? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	ARE VERNAL POOLS PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If yes, complete the Vernal Pool Table)
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PROPOSED WETLAND IMPACT TYPE: NA	PROPOSED WETLAND IMPACT AREA: NA
<b>SECTION 4 - WETLANDS FUNCTIONS AND VALUES (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)</b>	
<p>The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:</p> <ol style="list-style-type: none"> <li>1. Ecological Integrity (from RSA 482-A:2, XI)</li> <li>2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value)</li> <li>3. Fish &amp; Aquatic Life Habitat (from USACE Highway Methodology: Fish &amp; Shellfish Habitat)</li> <li>4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration)</li> <li>5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge)</li> <li>6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat)</li> <li>7. Nutrient Trapping/Retention &amp; Transformation (from USACE Highway Methodology: Nutrient Removal)</li> <li>8. Production Export (Nutrient) (from USACE Highway Methodology)</li> <li>9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics)</li> <li>10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention)</li> <li>11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization)</li> <li>12. Uniqueness/Heritage (from USACE Highway Methodology)</li> <li>13. Wetland-based Recreation (from USACE Highway Methodology: Recreation)</li> <li>14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat)</li> </ol> <p>First, determine if a wetland is suitable for a particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE <i>The Highway Methodology Workbook Supplement</i>. Second, indicate which functions and values are principal ("Principal Function/value?" column). As described in <i>The Highway Methodology Workbook Supplement</i>, "functions and values can be 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". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.</p>	

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
13	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
14	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	

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**SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)**

Delineations of vernal pools shall be based on the characteristics listed in the definition of “vernal pool” in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3<sup>rd</sup> Ed.*, 2016, published by the New Hampshire Fish and Game Department; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

“Important Notes” are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE “Vernal Pool Assessment” form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1					
2					
3					
4					
5					

**SECTION 6 - STREAM RESOURCES SUMMARY**

DESCRIPTION OF STREAM: Intermittent	STREAM TYPE (ROSGEN): B6
HAVE FISHERIES BEEN DOCUMENTED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	DOES THE STREAM SYSTEM APPEAR STABLE? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
OTHER KEY ON-SITE FUNCTIONS OF NOTE: minimally incised stream w/occasional fringe wetlands	

The following table can be used to compile data on stream resources. “Important Notes” are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	NH Method, See attached Ecological Integrity Data Form	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Score = 8.5
2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2,4,5,10,11,12,13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached Functional Assessment Report and data forms dated 04/03/18
3	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1,7,8,16,17	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6,7,9,12,13,14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
5	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6,7,9,12,13,14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See attached
6	<input type="checkbox"/> Yes <input type="checkbox"/> No	See NHB Report	<input type="checkbox"/> Yes <input type="checkbox"/> No	See attached
7	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7,8,9, 13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
8	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1,7,12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
9	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7,10,11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3,4,6,7,8,10,13,16	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1,2,9,13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7,10,16,18,19,22	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4,6,11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached
14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,4,7,8,13,21	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	See attached

**SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)**

- Wildlife and vegetation diversity/abundance list.
- Photograph of wetland.
- Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.
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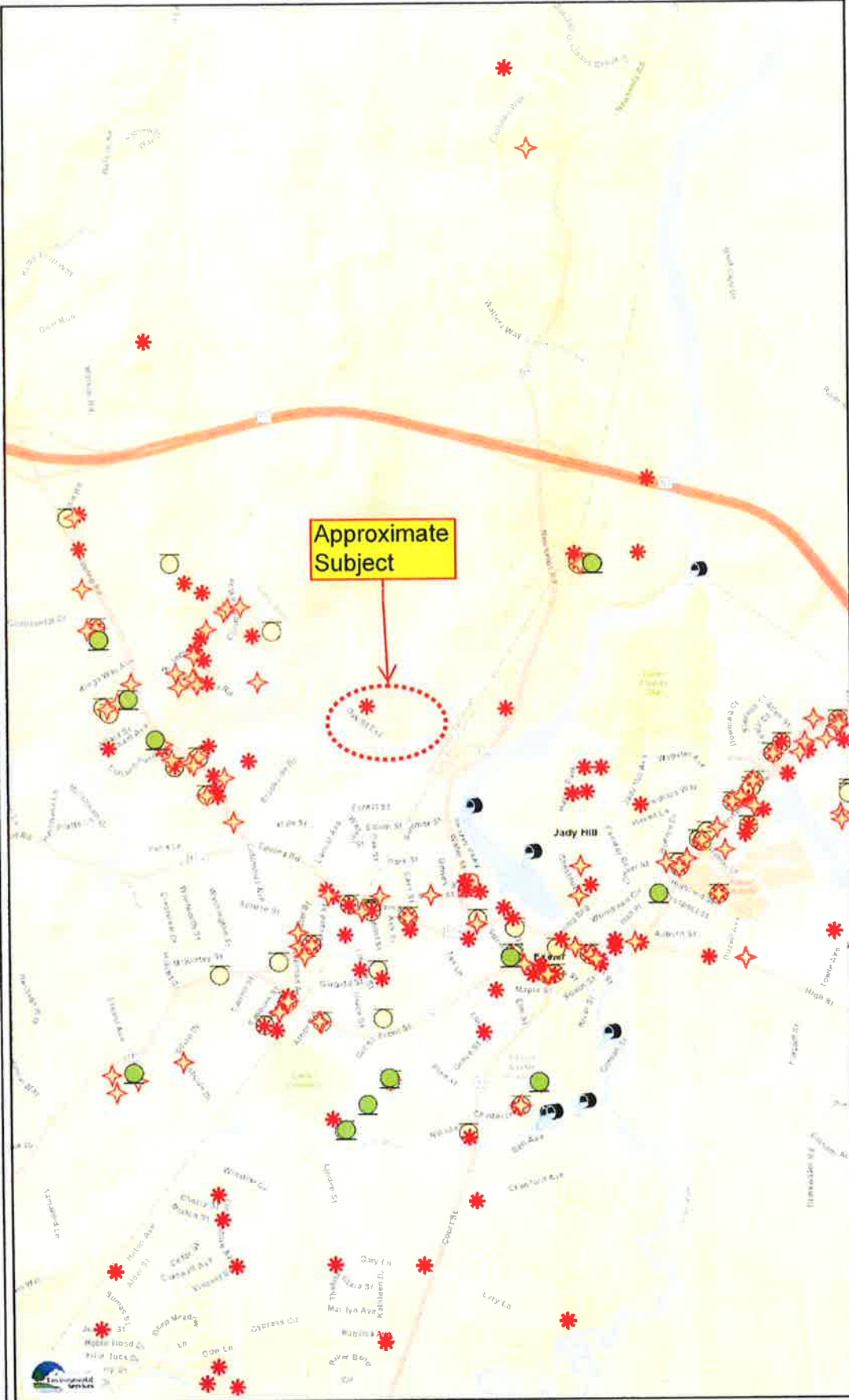


# Rose Farm

Oak Street Extension  
Exeter, NH *MEG*  
2018 image



# Exeter Rose Farm, LLC



## Legend

- Aboveground Storage Tank
- ➔ Automobile Salvage Yards
- ◆ Hazardous Waste Generators
- NPDES Outfalls
- ★ Remediation Sites
- Solid Waste Facilities
- Underground Storage Tank

## Map Scale

1: 25,977

© NH DES, <http://des.nh.gov>

Map Generated: 4/2/2021



## Notes

# StreamStats Report

**Region ID:**

NH

**Workspace ID:**

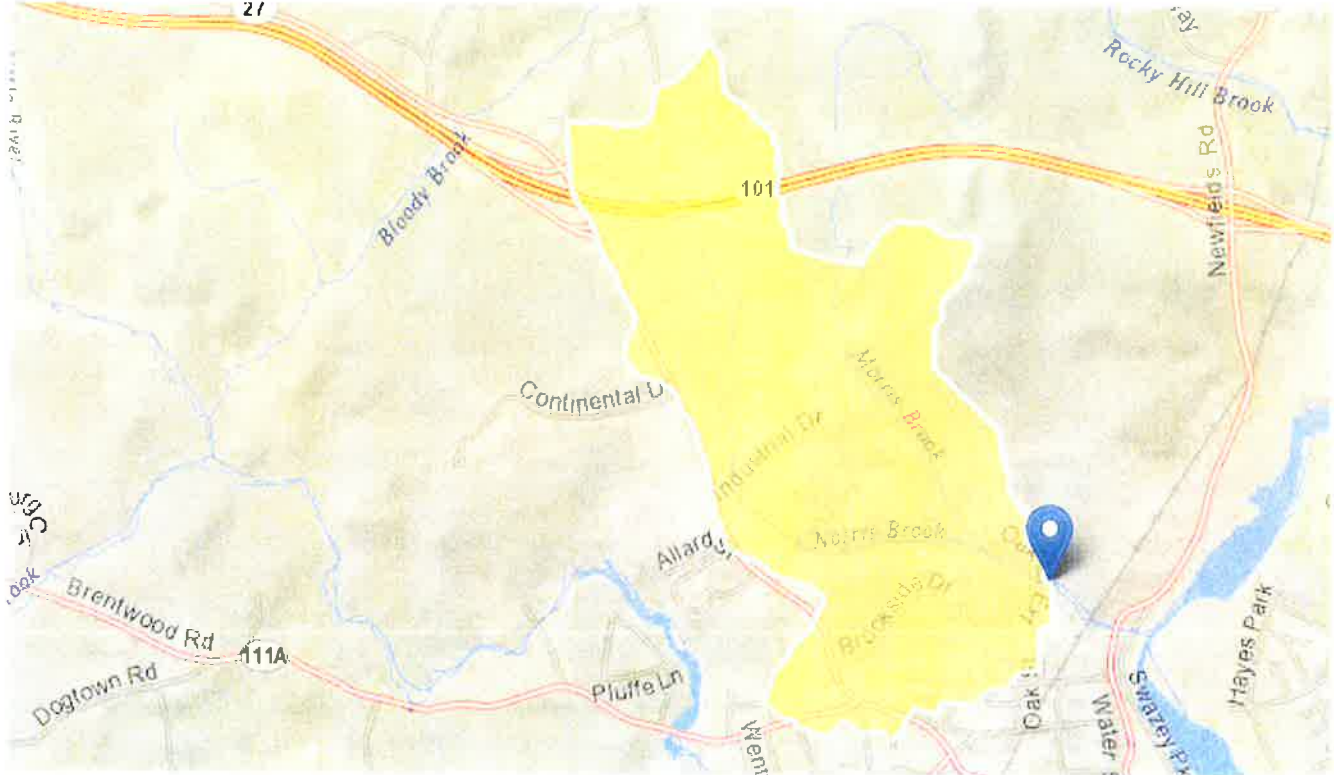
NH20170623154705944000

**Clicked Point (Latitude, Longitude):**

42.98922, -70.95511

**Time:**

2017-06-23 15:47:24 -0400



## Basin Characteristics

**Parameter**

Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.85	square miles
CONIF	Percentage of land surface covered by coniferous forest	11.1098	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	8.78	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	3.962	percent

<b>Parameter Code</b>	<b>Parameter Description</b>	<b>Value</b>	<b>Unit</b>
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	16.262	percent
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	9.6	inches
TEMP	Mean Annual Temperature	46.968	degrees F
TEMP_06_10	Basinwide average temperature for June to October summer period	62.594	degrees F
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	17.3	inches
ELEVMAX	Maximum basin elevation	179.626	feet
APRAVPRE	Mean April Precipitation	4.243	inches
WETLAND	Percentage of Wetlands	2.2227	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	55.1	feet per mi
SNOFALL	Mean Annual Snowfall	58.365	inches
PREBC_1112	Mean annual precipitation of basin centroid for November 1 to December 31 period	9.25	inches
PRECIPCENT	Mean Annual Precip at Basin Centroid	44.9	inches
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	45.1	inches
MINTEMP_W	Mean winter minimum air temperature over basin surface area	17.562	degrees F

### Seasonal Flow Statistics Parameters [100 Percent (0.849 square miles) Low Flow Statewide]

<b>Parameter Code</b>	<b>Parameter Name</b>	<b>Value</b>	<b>Units</b>	<b>Min Limit</b>	<b>Max Limit</b>
DRNAREA	Drainage Area	0.85	square miles	3.26	689
CONIF	Percent Coniferous Forest	11.1098	percent	3.07	56.2
PREBC0103	Jan to Mar Basin Centroid Precip	8.78	inches	5.79	15.1

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
BSLDEM30M	Mean Basin Slope from 30m DEM	3.962	percent	3.19	38.1
MIXFOR	Percent Mixed Forest	16.262	percent	6.21	46.1
PREG_03_05	Mar to May Gage Precipitation	9.6	inches	6.83	11.5
TEMP	Mean Annual Temperature	46.968	degrees F	36	48.7
TEMP_06_10	Jun to Oct Mean Basinwide Temp	62.594	degrees F	52.9	64.4
PREG_06_10	Jun to Oct Gage Precipitation	17.3	inches	16.5	23.1
ELEVMAX	Maximum Basin Elevation	179.626	feet	260	6290

### Seasonal Flow Statistics Disclaimers [100 Percent (0.849 square miles) Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

### Seasonal Flow Statistics Flow Report [100 Percent (0.849 square miles) Low Flow Statewide]

Statistic	Value	Unit
Jan to Mar15 60 Percent Flow	0.695	ft <sup>3</sup> /s
Jan to Mar15 70 Percent Flow	0.584	ft <sup>3</sup> /s
Jan to Mar15 80 Percent Flow	0.494	ft <sup>3</sup> /s
Jan to Mar15 90 Percent Flow	0.353	ft <sup>3</sup> /s
Jan to Mar15 95 Percent Flow	0.275	ft <sup>3</sup> /s
Jan to Mar15 98 Percent Flow	0.217	ft <sup>3</sup> /s
Jan to Mar15 7 Day 2 Year Low Flow	0.466	ft <sup>3</sup> /s
Jan to Mar15 7 Day 10 Year Low Flow	0.246	ft <sup>3</sup> /s
Mar16 to May 60 Percent Flow	1.31	ft <sup>3</sup> /s
Mar16 to May 70 Percent Flow	1.06	ft <sup>3</sup> /s
Mar16 to May 80 Percent Flow	0.884	ft <sup>3</sup> /s
Mar16 to May 90 Percent Flow	0.692	ft <sup>3</sup> /s
Mar16 to May 95 Percent Flow	0.551	ft <sup>3</sup> /s
Mar16 to May 98 Percent Flow	0.403	ft <sup>3</sup> /s
Mar16 to May 7 Day 2 Year Low Flow	0.605	ft <sup>3</sup> /s

<b>Statistic</b>	<b>Value</b>	<b>Unit</b>
Mar16 to May 7 Day 10 Year Low Flow	0.324	ft <sup>3</sup> /s
Jun to Oct 60 Percent Flow	0.069	ft <sup>3</sup> /s
Jun to Oct 70 Percent Flow	0.047	ft <sup>3</sup> /s
Jun to Oct 80 Percent Flow	0.0304	ft <sup>3</sup> /s
Jun to Oct 90 Percent Flow	0.0169	ft <sup>3</sup> /s
Jun to Oct 95 Percent Flow	0.0102	ft <sup>3</sup> /s
Jun to Oct 98 Percent Flow	0.00837	ft <sup>3</sup> /s
Jun to Oct 7 Day 2 Year Low Flow	0.0207	ft <sup>3</sup> /s
Jun to Oct 7 Day 10 Year Low Flow	0.00505	ft <sup>3</sup> /s
Nov to Dec 60 Percent Flow	0.524	ft <sup>3</sup> /s
Nov to Dec 70 Percent Flow	0.343	ft <sup>3</sup> /s
Nov to Dec 80 Percent Flow	0.213	ft <sup>3</sup> /s
Nov to Dec 90 Percent Flow	0.112	ft <sup>3</sup> /s
Nov to Dec 95 Percent Flow	0.0591	ft <sup>3</sup> /s
Nov to Dec 98 Percent Flow	0.0277	ft <sup>3</sup> /s
Oct to Nov 7 Day 2 Year Low Flow	0.217	ft <sup>3</sup> /s
Oct to Nov 7 Day 10 Year Low Flow	0.0508	ft <sup>3</sup> /s

#### Seasonal Flow Statistics Citations

**Flynn, R.H. and Tasker, G.D., 2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S. Geological Survey Scientific Investigations Report 02-4298, 66 p. (<http://pubs.water.usgs.gov/wrir02-4298>)**

#### Flow-Duration Statistics Parameters [100 Percent (0.849 square miles) Low Flow Statewide]

<b>Parameter Code</b>	<b>Parameter Name</b>	<b>Value</b>	<b>Units</b>	<b>Min Limit</b>	<b>Max Limit</b>
DRNAREA	Drainage Area	0.85	square miles	3.26	689
PREG_06_10	Jun to Oct Gage Precipitation	17.3	inches	16.5	23.1
TEMP	Mean Annual Temperature	46.968	degrees F	36	48.7

#### Flow-Duration Statistics Disclaimers [100 Percent (0.849 square miles) Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

## Flow-Duration Statistics Flow Report [100 Percent (0.849 square miles) Low Flow Statewide]

Statistic	Value	Unit
60 Percent Duration	0.352	ft <sup>3</sup> /s
70 Percent Duration	0.211	ft <sup>3</sup> /s
80 Percent Duration	0.101	ft <sup>3</sup> /s
90 Percent Duration	0.0409	ft <sup>3</sup> /s
95 Percent Duration	0.0214	ft <sup>3</sup> /s
98 Percent Duration	0.0113	ft <sup>3</sup> /s

### Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (<http://pubs.water.usgs.gov/wrir02-4298>)

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## Low-Flow Statistics Disclaimers [100 Percent (0.849 square miles) Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

## Low-Flow Statistics Flow Report [100 Percent (0.849 square miles) Low Flow Statewide]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0198	ft <sup>3</sup> /s
7 Day 10 Year Low Flow	0.00471	ft <sup>3</sup> /s

### Low-Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (<http://pubs.water.usgs.gov/wrir02-4298>)

**Peak-Flow Statistics Parameters** [100 Percent (0.849 square miles) Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.85	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	4.243	inches	2.79	6.23
WETLAND	Percent Wetlands	2.2227	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	55.1	feet per mi	5.43	543

**Peak-Flow Statistics Flow Report** [100 Percent (0.849 square miles) Peak Flow Statewide SIR2008 5206]

PIl: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	Plu	SEp	Equiv. Yrs.
2 Year Peak Flood	39	ft <sup>3</sup> /s	23.4	65.1	30.1	3.2
5 Year Peak Flood	69.6	ft <sup>3</sup> /s	41	118	31.1	4.7
10 Year Peak Flood	96.7	ft <sup>3</sup> /s	55.7	168	32.3	6.2
25 Year Peak Flood	136	ft <sup>3</sup> /s	75.2	245	34.3	8
50 Year Peak Flood	169	ft <sup>3</sup> /s	90.7	315	36.4	9
100 Year Peak Flood	210	ft <sup>3</sup> /s	109	407	38.6	9.8
500 Year Peak Flood	317	ft <sup>3</sup> /s	150	670	44.1	11

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (<http://pubs.usgs.gov/sir/2008/5206/>)

**Recharge Statistics Parameters** [100 Percent (0.849 square miles) Groundwater Recharge Statewide 2004 5019]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PREG_03_05	Mar to May Gage Precipitation	9.6	inches	6.83	11.54
CONIF	Percent Coniferous Forest	11.1098	percent	3.07	56.18
SNOFALL	Mean Annual Snowfall	58.365	inches	54.46	219.07
PREG_06_10	Jun to Oct Gage Precipitation	17.3	inches	16.46	23.11
TEMP	Mean Annual Temperature	46.968	degrees	36.05	48.69



<b>Parameter Code</b>	<b>Parameter Name</b>	<b>Value</b>	<b>Units</b>	<b>Min Limit</b>	<b>Max Limit</b>
MIXFOR	Percent Mixed Forest	16.262	percent	6.21	46.13
PREBC_1112	Nov to Dec Basin Centroid Precip	9.25	inches	6.57	15.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	44.9	inches	37.44	75.91
PRECIPOUT	Mean Annual Precip at Gage	45.1	inches	35.83	53.11
MINTEMP_W	Mean Winter Min Temperature	17.562	degrees F	0.8	19.88

**Recharge Statistics Flow Report** [100 Percent (0.849 square miles) Groundwater Recharge Statewide 2004 5019]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

<b>Statistic</b>	<b>Value</b>	<b>Unit</b>	<b>SEp</b>
GW_Recharge_Jan_to_Mar15	6.23	in	15.5
GW_Recharge_Mar16_to_May	7.65	in	12.4
GW_Recharge_Jun_to_Oct	2.53	in	26.5
GW_Recharge_Nov_to_Dec	4.46	in	15.8
GW_Recharge_Ann	22.6	in	12.4

Recharge Statistics Citations

Flynn, R.H. and Tasker, G.D.,2004, Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire, U.S. Geological Survey Scientific Investigations Report 2004-5019, 67 p. (<http://pubs.usgs.gov/sir/2004/5019/>)





**US Army Corps  
of Engineers** <sup>®</sup>  
New England District

Exeter Rose Farm, LLC  
Oak Street Extension  
Exeter, NH

**New Hampshire General Permits (GPs)  
Appendix B - Corps Secondary Impacts Checklist  
(for inland wetland/waterway fill projects in New Hampshire)**

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to “work” include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 5, regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

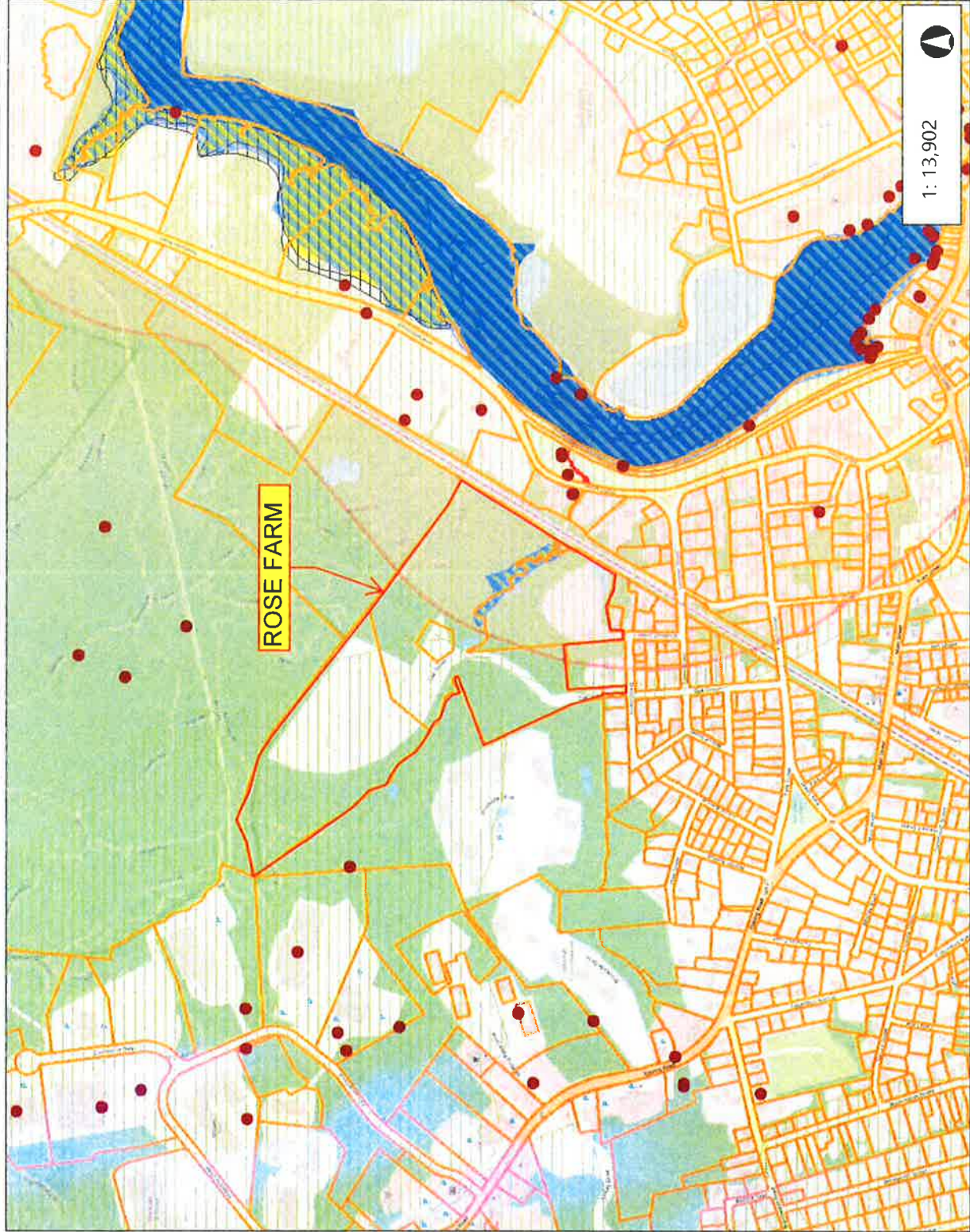
<b>1. Impaired Waters</b>	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? <a href="http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm">http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm</a> to determine if there is an impaired water in the vicinity of your work area.* See Attachment B1	X	
<b>2. Wetlands</b>	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to SAS, special wetlands. Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at <a href="https://www2.des.state.nh.us/nhb_datacheck/">https://www2.des.state.nh.us/nhb_datacheck/</a> . The book <a href="#">Natural Community Systems of New Hampshire</a> also contains specific information about the natural communities found in NH.	X Flood plain & possible RTE spec	
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)	X	
2.5 The overall project site is more than 40 acres?	X	
2.6 What is the area of the previously filled wetlands? See Attachment B2.	40,180 SF	
2.7 What is the area of the proposed fill in wetlands?	6,876 SF	
2.8 What is the % of previously and proposed fill in wetlands to the overall project site? (49.96 acres)	2.16%	
<b>3. Wildlife</b>	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: <a href="https://www2.des.state.nh.us/nhb_datacheck/">https://www2.des.state.nh.us/nhb_datacheck/</a> USFWS IPAC website: <a href="https://ecos.fws.gov/ipac/location/index">https://ecos.fws.gov/ipac/location/index</a> See Attachments B3 & B4.	X	

Exeter Rose Farm, LLC

<p>3.2 Would work occur in any area identified as either “Highest Ranked Habitat in N.H.” or “Highest Ranked Habitat in Ecological Region”? (These areas are colored magenta and green, respectively, on NH Fish and Game’s map, “2010 Highest Ranked Wildlife Habitat by Ecological Condition.”)</p> <ul style="list-style-type: none"> <li>• PDF: <a href="http://www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm">www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm</a>.</li> <li>• Data Mapper: <a href="http://www.granit.unh.edu">www.granit.unh.edu</a>.</li> <li>• GIS: <a href="http://www.granit.unh.edu/data/downloadfreedata/category/databycategory.html">www.granit.unh.edu/data/downloadfreedata/category/databycategory.html</a>.</li> </ul> <p style="text-align: right;">See Attachment B5</p>		X
<p>3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?</p>		X
<p>3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?</p>	X	
<p>3.5 Are stream crossings designed in accordance with the GC 21?</p>	X	
<p><b>4. Flooding/Floodplain Values</b></p>	Yes	No
<p>4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream? 1,107 SF</p>	X	
<p>4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage? (8.14 CY [220 CF] of permanent impact)</p>		X
<p><b>5. Historic/Archaeological Resources</b></p>		
<p>For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form (<a href="http://www.nh.gov/nhdhr/review">www.nh.gov/nhdhr/review</a>) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document** See Attachment B6</p>	X	

\*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.

\*\* If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.



1: 13,902

**Legend**

- Wetland\_Permits\_points
- Parcel Polygons
  - Parcel Polygons
  - Attributes for Additional Lines
- Parcel Lines
- Flood Plain Wetlands Adjacent
- Prime Wetlands with 100 ft Bui
- Prime Wetlands
- Peatlands
- Designated Rivers
  - Subject to SWQPA
  - Not Subject to SWQPA
- Sand Dunes
  - backdune
  - foredune
  - interdune
  - other
- Tidal Waters / Tidal Wetlands
  - Tidal wetland
  - Transitional salt marsh
  - Salt marsh
  - Mud flat
  - Tidal water
- Watersheds with Chloride Imp:
  - Surface Waters with Impairme:
    - Quarter Mile Buffer

**Notes**

IMPAIRED WATERS - ARMY CORPS  
APPENDIX B

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

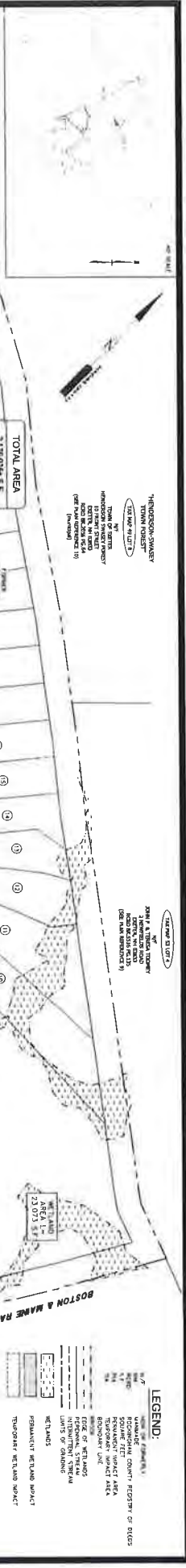
**THIS MAP IS NOT TO BE USED FOR NAVIGATION**

0.4 Miles

0 0.22 0.4

WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
© Latitude Geographics Group Ltd.

VICINITY PLAN



LEGEND



NOTES

1. THE PROJECT PROPERTY AND ADJACENT ON THE TOWN OF EXETER ASSOCIATION'S MAP...
2. OWNER OF RECORD PROPERTY: OAK STREET EXTENSION, LLC...
3. TITLE: OAK STREET EXTENSION, LLC...
4. THE PROJECT PROPERTY IS LOCATED IN THE R-1 LOW DENSITY SINGLE FAMILY RESIDENTIAL ZONING DISTRICT...
5. THE PROJECT PROPERTY IS SUBJECT TO THE EXETER ASSOCIATION'S MAP...
6. THE PROJECT PROPERTY IS SUBJECT TO THE EXETER ASSOCIATION'S MAP...
7. THE PROJECT PROPERTY IS SUBJECT TO THE EXETER ASSOCIATION'S MAP...
8. THE PROJECT PROPERTY IS SUBJECT TO THE EXETER ASSOCIATION'S MAP...
9. THE PROJECT PROPERTY IS SUBJECT TO THE EXETER ASSOCIATION'S MAP...
10. THE PROJECT PROPERTY IS SUBJECT TO THE EXETER ASSOCIATION'S MAP...
11. THE PROJECT PROPERTY IS SUBJECT TO THE EXETER ASSOCIATION'S MAP...

INDEX JURISDICTIONAL WETLANDS IMPACTS TABLE

WETLAND	WETLAND TYPE	WETLAND AREA (SQ FT)	WETLAND VALUE	WETLAND IMPACTS
1	Shaded Wetland	1,000.00	100.00	Loss of 100.00
2	Seasonally Flooded Wetland	2,000.00	200.00	Loss of 200.00
3	Open Water	500.00	50.00	Loss of 50.00
4	Wetland of High Biological Productivity	1,500.00	150.00	Loss of 150.00
5	Wetland of Moderate Biological Productivity	3,000.00	300.00	Loss of 300.00
6	Wetland of Low Biological Productivity	4,000.00	400.00	Loss of 400.00
7	Wetland of Very Low Biological Productivity	5,000.00	500.00	Loss of 500.00
8	Wetland of Minimal Biological Productivity	6,000.00	600.00	Loss of 600.00
9	Wetland of Negligible Biological Productivity	7,000.00	700.00	Loss of 700.00
10	Wetland of No Biological Productivity	8,000.00	800.00	Loss of 800.00
11	Wetland of Unknown Biological Productivity	9,000.00	900.00	Loss of 900.00
12	Wetland of Indeterminate Biological Productivity	10,000.00	1,000.00	Loss of 1,000.00
13	Wetland of Unassessable Biological Productivity	11,000.00	1,100.00	Loss of 1,100.00
14	Wetland of Unavailable Biological Productivity	12,000.00	1,200.00	Loss of 1,200.00
15	Wetland of Unobtainable Biological Productivity	13,000.00	1,300.00	Loss of 1,300.00
16	Wetland of Unusable Biological Productivity	14,000.00	1,400.00	Loss of 1,400.00
17	Wetland of Unavailable Biological Productivity	15,000.00	1,500.00	Loss of 1,500.00
18	Wetland of Unobtainable Biological Productivity	16,000.00	1,600.00	Loss of 1,600.00
19	Wetland of Unusable Biological Productivity	17,000.00	1,700.00	Loss of 1,700.00
20	Wetland of Unavailable Biological Productivity	18,000.00	1,800.00	Loss of 1,800.00
21	Wetland of Unobtainable Biological Productivity	19,000.00	1,900.00	Loss of 1,900.00
22	Wetland of Unusable Biological Productivity	20,000.00	2,000.00	Loss of 2,000.00
23	Wetland of Unavailable Biological Productivity	21,000.00	2,100.00	Loss of 2,100.00
24	Wetland of Unobtainable Biological Productivity	22,000.00	2,200.00	Loss of 2,200.00
25	Wetland of Unusable Biological Productivity	23,000.00	2,300.00	Loss of 2,300.00
26	Wetland of Unavailable Biological Productivity	24,000.00	2,400.00	Loss of 2,400.00
27	Wetland of Unobtainable Biological Productivity	25,000.00	2,500.00	Loss of 2,500.00
28	Wetland of Unusable Biological Productivity	26,000.00	2,600.00	Loss of 2,600.00
29	Wetland of Unavailable Biological Productivity	27,000.00	2,700.00	Loss of 2,700.00
30	Wetland of Unobtainable Biological Productivity	28,000.00	2,800.00	Loss of 2,800.00

General Note: This map was prepared by TFM & MSC as a preliminary design. It is not intended to be used for construction. The owner is responsible for obtaining all necessary permits and approvals. The information on this map may be subject to change without notice.

**TFM** **MSC**  
 TFM & MSC  
 175 Commercial Street, Suite 100  
 Portsmouth, NH 03801  
 Phone: (603) 430-2222  
 www.tfm-and-msc.com

TAX MAP 54 LOTS 5, 6 & 7 AND MAP 63 LOT 205  
 INDEX JURISDICTIONAL WETLAND AREAS & IMPACTS PLAN  
 OAK STREET EXTENSION & FOREST STREET  
 EXETER, NEW HAMPSHIRE, COUNTY OF ROCKINGHAM  
 OWNED BY  
 EXETER ROSE FARM, LLC & THE  
 BENJAMIN & JOAN DAOSTINO REVOCABLE TRUSTS  
 PREPARED FOR  
 EXETER ROSE FARM, LLC  
 FEBRUARY 20, 2018

SCALE: 1"=100'

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location


Rockingham County, New Hampshire



## Local office

New England Ecological Services Field Office

☎ (603) 223-2541

 (603) 223-0104

70 Commercial Street, Suite 300  
Concord, NH 03301-5094

<http://www.fws.gov/newengland>



# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. [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.

The following species are potentially affected by activities in this location:

## Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> Wherever found No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds>

</pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

**Bald Eagle** *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

**Breeds Oct 15 to Aug 31**

**Black-billed Cuckoo** *Coccyzus erythrophthalmus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9399>

Breeds May 15 to Oct 10

**Bobolink** *Dolichonyx oryzivorus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Jul 31

**Buff-breasted Sandpiper** *Calidris subruficollis*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9488>

Breeds elsewhere

**Canada Warbler** *Cardellina canadensis*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Aug 10

**Dunlin** *Calidris alpina arctica*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds elsewhere

**Lesser Yellowlegs** *Tringa flavipes*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9679>

Breeds elsewhere

**Nelson's Sparrow** *Ammodramus nelsoni*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 15 to Sep 5

**Prairie Warbler** *Dendroica discolor*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 1 to Jul 31

**Red-throated Loon** *Gavia stellata*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds elsewhere

**Rusty Blackbird** *Euphagus carolinus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

**Breeds elsewhere****Semipalmated Sandpiper** *Calidris pusilla*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

**Breeds elsewhere****Snowy Owl** *Bubo scandiacus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

**Breeds elsewhere****Wood Thrush** *Hyllocichla mustelina*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

**Breeds May 10 to Aug 31**

## Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum

probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### Breeding Season ( )

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

### No Data (–)

A week is marked as having no data if there were no survey events for that week.

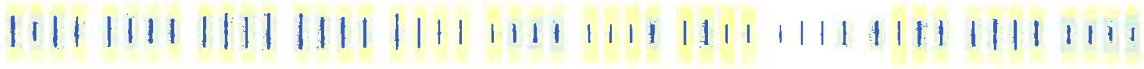
### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

probability of presence    breeding season    | survey effort    – no data

SPECIES    JAN    FEB    MAR    APR    MAY    JUN    JUL    AUG    SEP    OCT    NOV    DEC

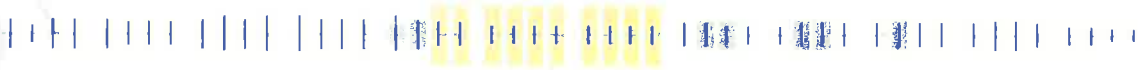
Bald Eagle  
Non-BCC  
Vulnerable  
(This is not a  
Bird of  
Conservation  
Concern (BCC)  
in this area,  
but warrants  
attention  
because of  
the Eagle Act  
or for  
potential  
susceptibilities  
in offshore  
areas from  
certain types  
of  
development  
or activities.)

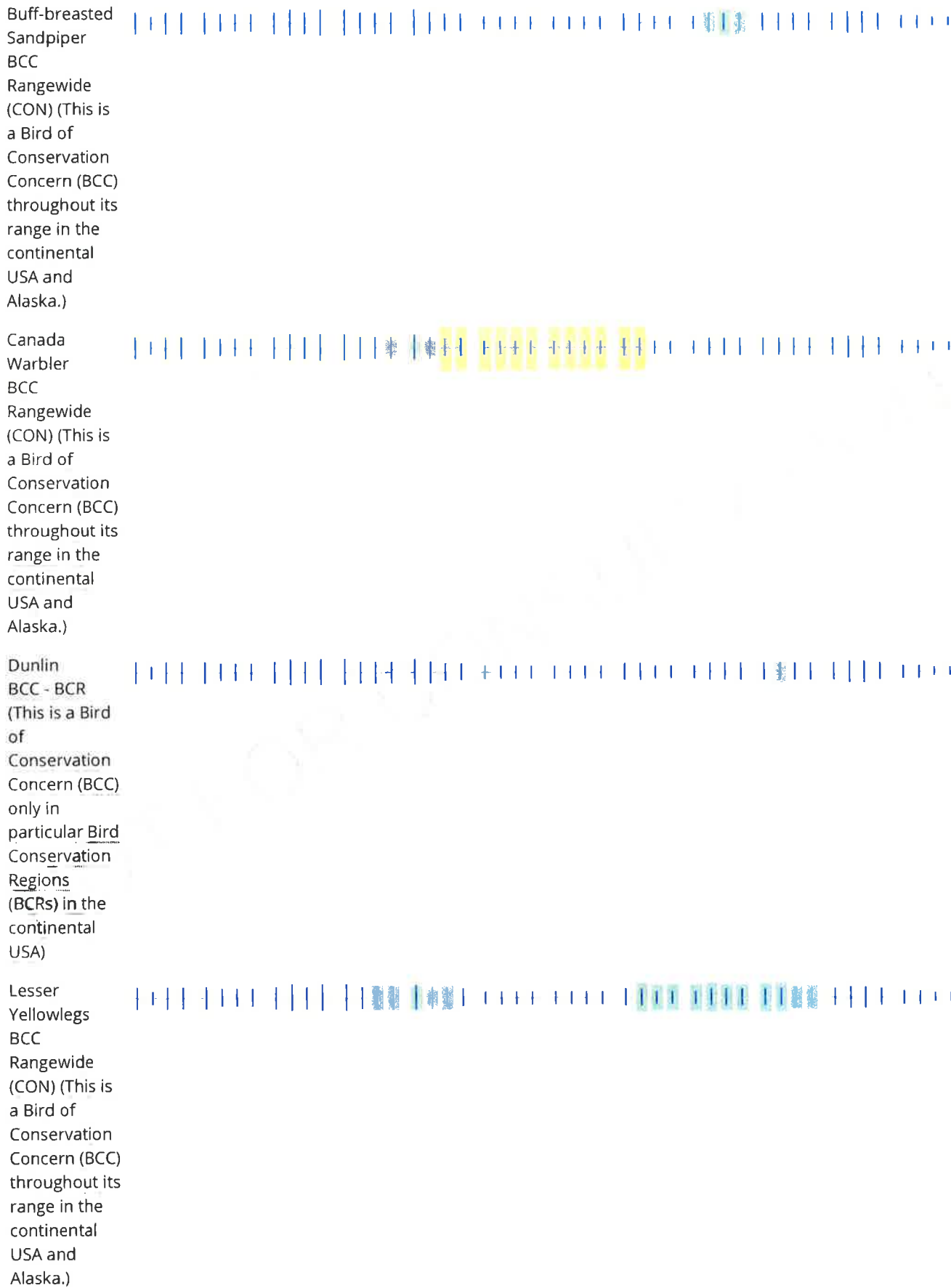


Black-billed  
Cuckoo  
BCC  
Rangewide  
(CON) (This is  
a Bird of  
Conservation  
Concern (BCC)  
throughout its  
range in the  
continental  
USA and  
Alaska.)



Bobolink  
BCC  
Rangewide  
(CON) (This is  
a Bird of  
Conservation  
Concern (BCC)  
throughout its  
range in the  
continental  
USA and  
Alaska.)





Buff-breasted Sandpiper  
BCC  
Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Canada Warbler  
BCC  
Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Dunlin  
BCC - BCR  
(This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Lesser Yellowlegs  
BCC  
Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

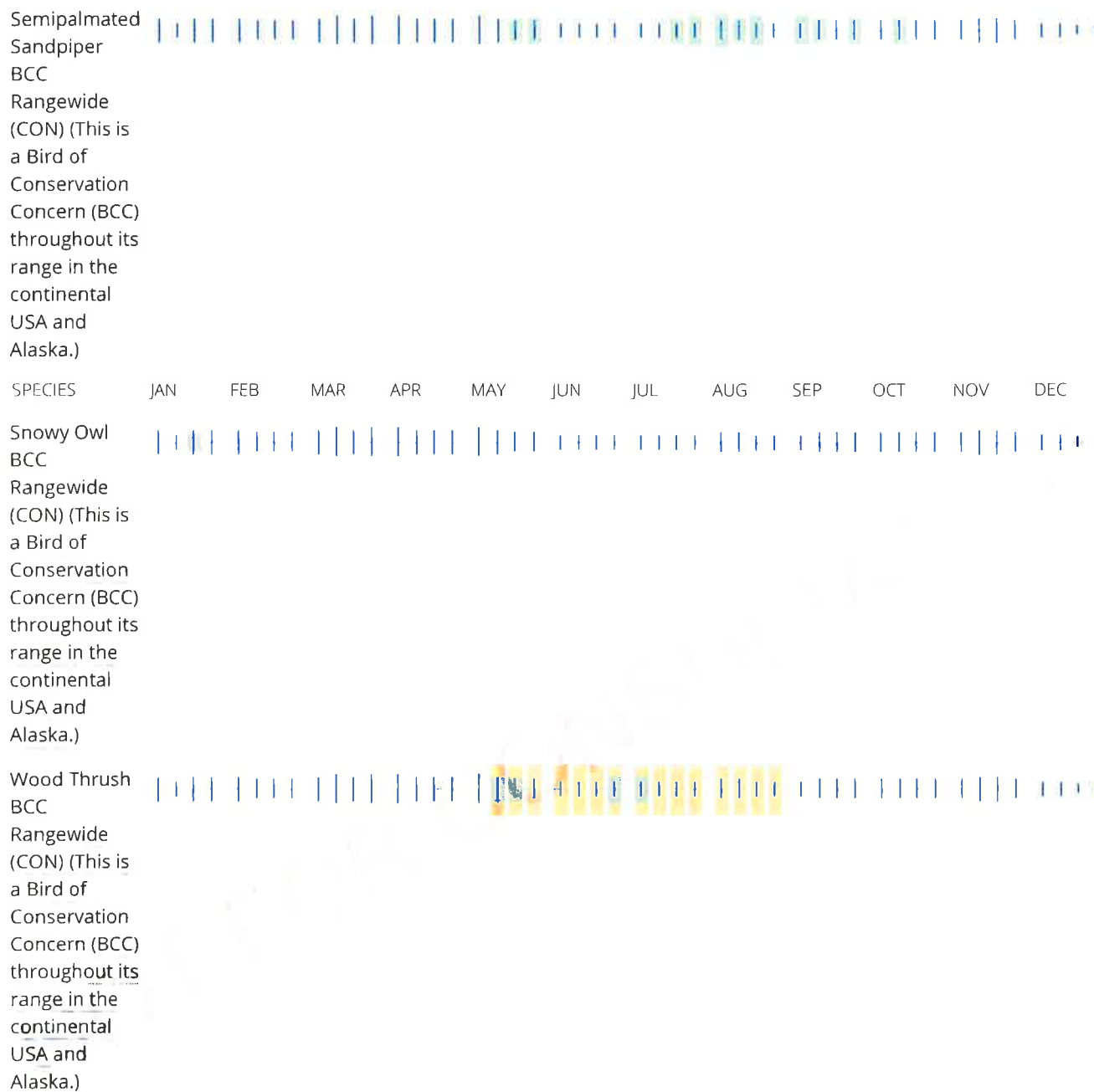


Nelson's Sparrow  
 BCC  
 Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Prairie Warbler  
 BCC  
 Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Red-throated Loon  
 BCC  
 Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Rusty Blackbird  
 BCC  
 Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

### What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

### What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore

energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

### Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

# Facilities

## National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

## Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

## Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

[PSS1/FO1E](#)

[PFO1E](#)

FRESHWATER POND

[PUB/SS1F](#)

[PABHx](#)

[PUBHx](#)

[PUBFh](#)[PUBF](#)

RIVERINE

[R5UBH](#)[R4SBC](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

**CONFIDENTIAL – NH Dept. of Environmental Services review**

NH Natural Heritage Bureau  
 NHB Datacheck Results Letter

**Memo**

**To:** Irina Donskaia, MSC a division of TFMoran, Inc.  
 170 Commerce Way, Suite 102  
 Portsmouth, NH 03801

**From:** Amy Lamb, NH Natural Heritage Bureau  
**Date:** 1/7/2021 (valid until 01/07/2022)

**Re:** Review by NH Natural Heritage Bureau  
**Permits:** NHDES - Other Permit, NHDES - Wetlands Permit

NHB ID: NHB20-3776      Town: Exeter      Location: Tax Maps: Tax Map 54 Lots 5, 6, 7 & Tax Map 63, Lot 205

**Description:** Previous Project NHB17-2271. Was held up in court and now active. 41 Residential lots. The total area of the subdivision is 49.95± acres with 23.02± acres being proposed for Common Open Space.

**cc:** Kim Tuttle

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

**Comments** NHB: Please send NHB information about any new wetland impacts proposed since the previous version of the project. F&G: No Comments At This Time

<b>Plant species</b>	<b>State<sup>1</sup></b>	<b>Federal</b>	<b>Notes</b>
sharp-flowered manna grass ( <i>Glyceria acutiflora</i> *)	E	--	Primarily vulnerable to changes to the hydrology of its habitat, especially alterations that change water levels. It may also be susceptible to increased pollutants and nutrients carried in stormwater runoff.

<b>Vertebrate species</b>	<b>State<sup>1</sup></b>	<b>Federal</b>	<b>Notes</b>
American Eel ( <i>Anguilla rostrata</i> )	SC	--	Contact the NH Fish & Game Dept (see below).
Northern Black Racer ( <i>Coluber constrictor constrictor</i> )	T	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle ( <i>Glyptemys insculpta</i> )	SC	--	Contact the NH Fish & Game Dept (see below).

<sup>1</sup>Codes: "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.

## **CONFIDENTIAL – NH Dept. of Environmental Services review**

### **Memo**

NH Natural Heritage Bureau  
NHB Datatcheck Results Letter

*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.

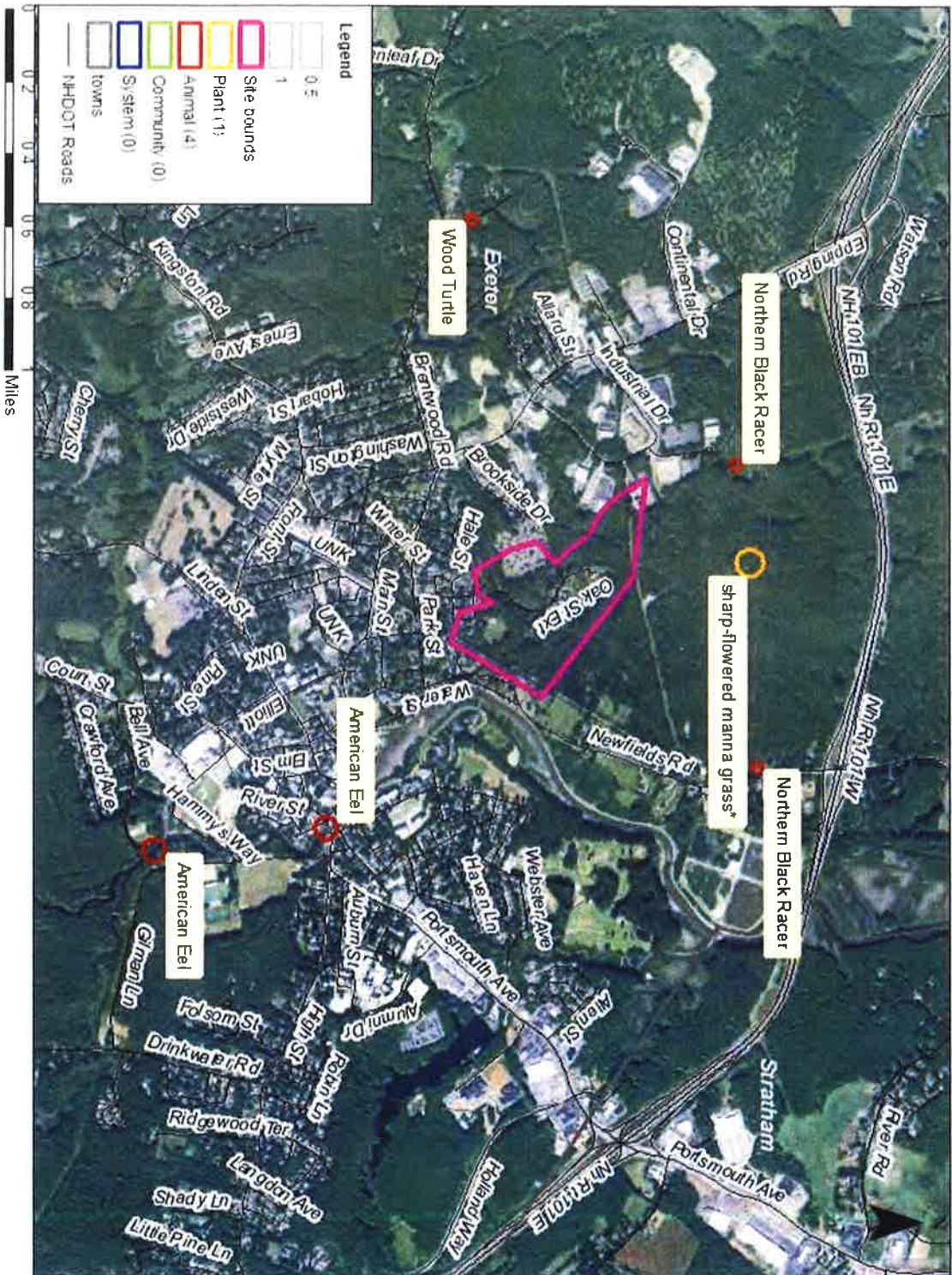
Department of Natural and Cultural Resources  
Division of Forests and Lands  
(603) 271-2214 fax 271-6488

DNCR/NHB  
172 Pembroke Rd.  
Concord, NH 03301



CONFIDENTIAL – NH Dept. of Environmental Services review

NHB20-3776









## New Hampshire Natural Heritage Bureau - Animal Record

### Northern Black Racer (*Coluber constrictor constrictor*)

**Legal Status**

Federal: Not listed  
 State: Listed Threatened

**Conservation Status**

Global: Demonstrably widespread, abundant, and secure  
 State: Imperiled due to rarity or vulnerability

**Description at this Location**

Conservation Rank: Not ranked  
 Comments on Rank: --

Detailed Description: 2012: Area 13078: 1 adult observed. 2009: Area 14214: 1 adult observed, sex unknown.  
 General Area: 2012: Area 13078: Residential yard. 2009: Area 14214: Edge of beaver pond which has most of its margin forested with mixed hardwood.

General Comments: --  
 Management: --  
 Comments:

**Location**

Survey Site Name: The Oaklands  
 Managed By:

County: Rockingham  
 Town(s): Exeter  
 Size: .9 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2012: Area 13078: 20 Newfields Road, Exeter. 2009: Area 14214: Edge of beaver pond facing North in Henderson/Swasey Town Forest, Exeter.

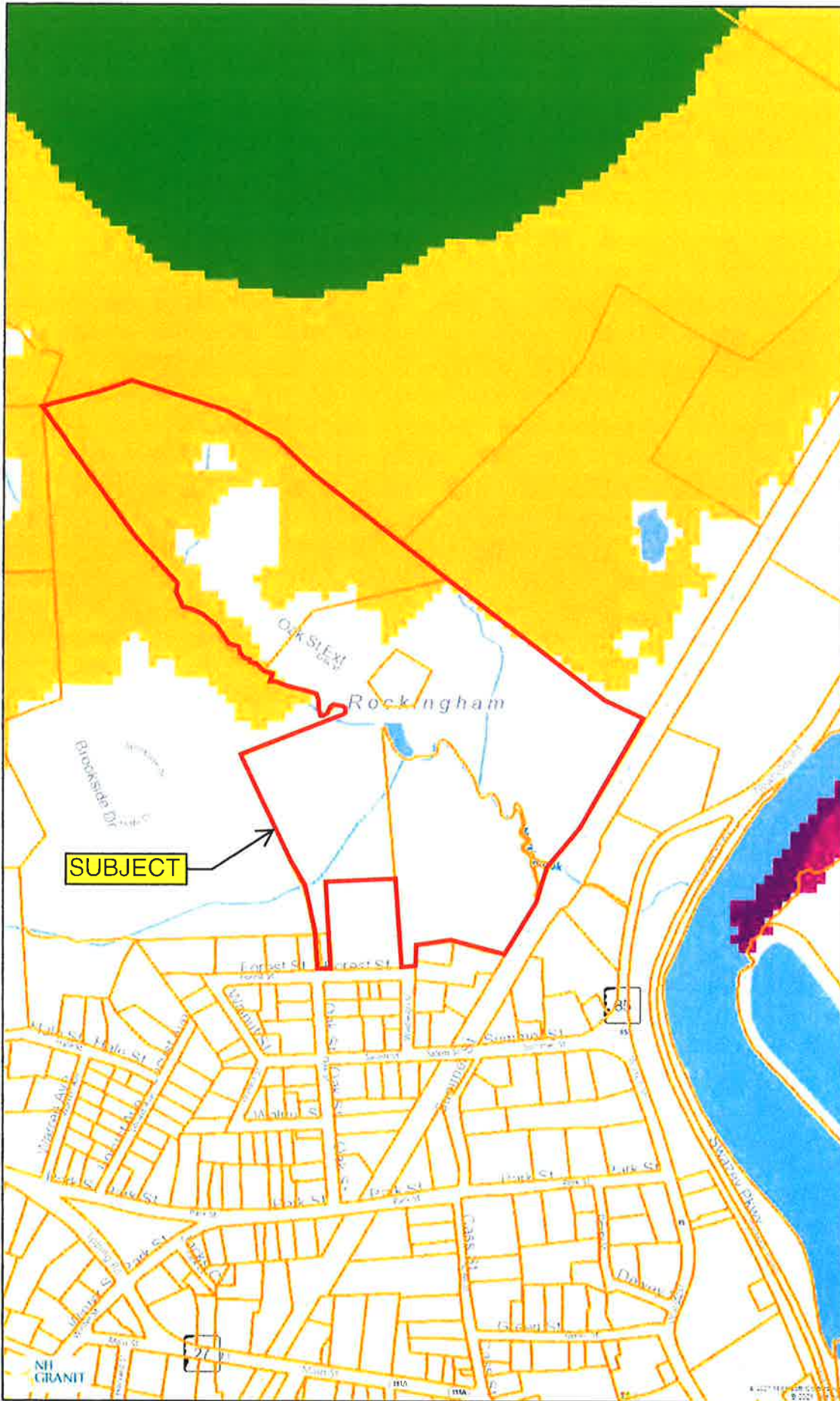
**Dates documented**

First reported: 2009-04-28                      Last reported: 2012-06-23

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.



# EXETER ROSE FARM, LLC



## Legend

- Parcels
  - Parcel Polygons
  - Attributes for Additional Lines
- State
- County
- City/Town
- WAP 2020: Highest Ranked Wildlife Habitat
  - 1 Highest Ranked Habitat in NH
  - 2 Highest Ranked Habitat in Region
  - 3 Supporting Landscape

Attachment B5

Map Scale

1: 6,494

© NH GRANIT, [www.granit.unh.edu](http://www.granit.unh.edu)

Map Generated: 6/7/2021



## Notes

NHF&G WILDLIFE ACTION PLAN







Please mail the completed form and required material to:

New Hampshire Division of Historical Resources  
State Historic Preservation Office  
Attention: Review & Compliance  
19 Pillsbury Street, Concord, NH 03301-3570

RECEIVED  
JUN 22 2018

DHR Use Only	
R&C #	9839
Log In Date	___/___/___
Response Date	___/___/___
Sent Date	___/___/___

### Request for Project Review by the New Hampshire Division of Historical Resources

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

<b>GENERAL PROJECT INFORMATION</b>
Project Title Exeter Rose Farm, LLC - Multi-lot Residential Subdivision
Project Location Oak Street Extension and Forest Street
City/Town Exeter Tax Map 54 / 63 Lot # 5,6 & 7 / 205
NH State Plane - Feet Geographic Coordinates: Easting 1174238 Northing 180060 (See RPR Instructions and R&C FAQs for guidance.)
Lead Federal Agency and Contact (if applicable) US Army Corps (Agency providing funds, licenses, or permits) Permit Type and Permit or Job Reference # TBD
State Agency and Contact (if applicable) NHDES Permit Type and Permit or Job Reference # Wetlands/TBD
<b>APPLICANT INFORMATION</b>
Applicant Name Exeter Rose Farm, LLC
Mailing Address 953 Islington St. #23D Phone Number 603 443 0255
City Portsmouth State NH Zip 03801 Email keith@bakerprop.com
<b>CONTACT PERSON TO RECEIVE RESPONSE</b>
Name/Company Marc Jacobs, Consulting Wetland Scientist
Mailing Address P.O. Box 417 Phone Number 603 686 5097
City Greenland State NH Zip 03840 Email jacobs2wetsoil2004@yahoo.com

This form is updated periodically. Please download the current form at [www.nh.gov/nhdhr/review](http://www.nh.gov/nhdhr/review). Please refer to the Request for Project Review Instructions for direction on completing this form. Submit one copy of this project review form for each project for which review is requested. Include a 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 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: [www.nh.gov/nhdhr/review](http://www.nh.gov/nhdhr/review) or contact the R&C Specialist at [christina.st.louis@nh.gov](mailto: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 defined project boundary.* (See RPR Instructions and R&C FAQs for guidance.)
- Attach a detailed narrative description of the proposed project.
- Attach a site plan. The site plan should include the project boundaries and areas of proposed excavation.
- Attach photos of the project area (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) (Informative photo captions are requested.)
- A DHR file review must be conducted to identify properties within or adjacent to the project area. Provide file review results in Table 1. (Blank table forms are available on the DHR website.)  
File review conducted on 05/24/2018. (Nothing found.)

Architecture

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

Approximate age(s): 1940-1967

- Photographs of *each* resource or streetscape located within the project area, with captions, along with a mapped photo key. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)
- If the project involves rehabilitation, demolition, additions, or alterations to existing buildings or structures, provide additional photographs showing detailed project work locations. (i.e. Detail photo of windows if window replacement is proposed.)

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.

**DHR Comment/Finding Recommendation** *This Space for Division of Historical Resources Use Only*

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

No Potential to cause Effects  No Historic Properties Affected  No Adverse Effect  Adverse Effect

Comments: PROJECT AREA EXHIBITS HIGH ARCHAEOLOGICAL SENSITIVITY.  
SURVEY NECESSARY BEFORE INFORMED COMMENT CAN BE MADE.

Please seek comment from The Executive  
Heritage Committee and Demolition Review Committee  
and forward to the DHR.

*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 Signature: David Sully

Date: 6/29/18

# NH Division of Historical Resources

## Bibliography Form and Short Report

Document ID:

THIS REPORT CONTAINS CONFIDENTIAL INFORMATION  
NOT FOR PUBLIC DISTRIBUTION

Complete this form for ALL archaeological reports submitted to the DHR. Refer to the manual for guidance at: [http://www.nh.gov/nhdhr/archaeology\\_forms\\_manuals.htm](http://www.nh.gov/nhdhr/archaeology_forms_manuals.htm)

This form is being used for:  Short Report *AND* Bibliography Form  Bibliography Form Only

**Short Report *AND* Bibliography Form original hard copy** must be mailed to the address below. In addition, submit an electronic version of the report (including attachments) to: [tanya.krajcik@dcr.nh.gov](mailto:tanya.krajcik@dcr.nh.gov).

**Bibliography Form Only** may be submitted electronically to: [tanya.krajcik@dcr.nh.gov](mailto:tanya.krajcik@dcr.nh.gov); Or a hard copy, accompanied with a CD of the form, may be mailed to the address below.

NH Division of Historical Resources  
Attn: Review & Compliance  
19 Pillsbury Street  
Concord, NH 03301-3570

DHR Review #: 9839

Report Type: Phase IA Short Report

Report Date: 2021-06-26

Author's Last Name: Goodby

Author's First Name: Robert

Additional Authors:

Source Institution: Monadnock Archaeological Consulting, LLC

Title: Phase IA Archaeological Sensitivity Assessment, Rose Farm LLC Multi-Lot Residential Subdivision, Exeter, New Hampshire

Lead Federal or State Agency: US Army Corps, NHDES

**Abstract:** Phase IA Archaeological Sensitivity Assessment was completed for the proposed Rose Farm LLC Multi-Lot Residential Subdivision in Exeter, New Hampshire (Figures 1-3). The project area has been extensively disturbed by modern and historic activity. No further study is recommended.

Investigation Type: Phase IA

Excavated: No

Sites Found: No

Comments:

Enter the geographical coordinates for the project area below (NH State Plane - feet).  
NH State Plane coordinates can be found on the GRANIT website at: <http://granitview.unh.edu>.

Easting: 1174238

Northing: 180060

Area Surveyed (Acres): 50

Date Survey Completed: 2021-06-25

No. of Pages: 18

No. of Maps: 8

No. of Figures: 21

Location &amp; Site Numbers:

	<b>City/Town</b>	<b>Site Number</b>
+		
-		

**STOP here if this is a Bibliography Form only**

If this form is being used as a Short Report (a substitute for a Phase IA report where the investigation did not result in the identification of any archaeological sites or areas of archaeological sensitivity within the project area) please include the following information for DHR review.

**Description of methodology employed:**

A review of previously recorded archaeological sites, historic maps and aerial photographs (Figures 4-9), local histories, and previous archaeological studies in the New Hampshire Seacoast region was completed to identify known and potential archaeological sites in the project area. A systematic visual inspection of the project area, including photographic documentation of prevailing terrain and conditions (Plates 1-20) was completed on June 25, 2021.

**Explanation of why the project area was determined *not* archaeologically sensitive:**

The project area is situated directly west of Norris Brook, a narrow, shallow tributary of the Squamscott River that is bounded by low, poorly drained, disturbed terrain (Figures 1-3; Plates 17, 19). It is bounded on the east by the Boston and Maine Railroad line (Plate 20). Access to the project area is provided by Oak Street Extension, a formerly paved road that leads to several 20<sup>th</sup> century residences and structures (Plates 1, 11, 12, 14, 16). A natural spring, known as Rowland Spring and, later, Jailhouse Spring, is present on the north side of Oak Street Extension at the southern end of the project area (Figure 3). Most of the project area is covered with secondary growth forest and open meadow (Plates 8, 16, 18). The eastern portion of the project area, the setting of a proposed open space area, is dominated by poorly drained, uneven terrain (Plate 18). Most of the project area is underlain by Boxford Silt-Loam (3-8% slope), a moderately well-drained glaciomarine soil. The northern end of the project area is underlain by Eldridge Fine Sandy Loam (3-8% slope), a moderately well-drained outwash soil overlying glaciomarine deposits. Both soil types are classified as prime farmland, and it is likely the area was used for agriculture in the 18<sup>th</sup> and early 19<sup>th</sup> centuries.

Background research and visual inspection determined that the entire project area has been extensively disturbed by historic and modern activity. Nineteenth century maps (Figures 6, 7) show the project area was the location of active brickyards that were deeply excavated into the underlying glaciomarine soils. From the 1940s through the 1980s, the project area was the location of the Rose Farm that included large commercial greenhouses, the locations of which are visible on historic aerial photographs (Figure 9). These greenhouses were subsequently demolished and much of the debris is still present on the site, incorporated into the terrain previously disturbed by brickyard activities (Plates 2, 4, 5, 6, 9, 10). Additional disturbance to the project area occurred from the construction of Oak Street Extension, the existing residences, associated underground and above-ground utilities, retention ponds, and historic and modern dumping (Plates 2, 6, 10-15). This disturbance was confirmed by soil cores taken across the project area, none of which revealed intact, normal stratigraphy (Plates 3, 7).

A single previously recorded Native American site, the Jailhouse Spring Site (27RK0222) is located in the project area in the vicinity of the existing residences on Oak Avenue Extension (Figure 3, Plate 14). This was the reported location of a stone mortar and possible second mortar, recorded in the Bill White collection. Testing at the site by the University of New Hampshire as part of the Coastal Zone Survey in the 1970s identified a scatter of quartz and hornfels flakes with associated historic artifacts in an area surrounded by old borrow pits and disturbed terrain. The archaeological inventory form completed in the 1970s noted that a portion of the site had already been destroyed by filling. While this indicates that there had been a Native American site in the project area, the subsequent extensive disturbance indicates that intact Native American sites are not expected to occur here.

Apart from the brickyards and the spring on the southern edge of the project area, historic maps do not depict any residences, roads, or features in the project area until the 20<sup>th</sup> century (Figures 4-7). Although the project area is directly north of the Park Street National Historic District, there are no previously recorded historic sites in or adjacent to the project area, and no historic features were noted during the visual inspection. A recent summary of the Jailhouse Spring location (Rimkunas 2010) indicates the area was originally used to produce salt hay, and that the spring attracted early Euroamerican settlers. First owned by John Wheelwright, the large parcel of land that includes the project area was later owned by the Reverend William Rowland, whose house was on the opposite side of the railroad tracks from the project area. The spring furnished an important source of clean, fresh water for a nearby school and the jailhouse on Forest Street, as well as for local residents, and a formal brick spring house was constructed shortly after the murder of a young woman at the site in 1911. This structure is no longer in existence, but a pipe still provides a source of fresh spring water for local residents. Because of the lack of evidence

for historic structures in the project area, and because of the extensive historic and modern disturbance, intact historic sites are not expected to occur here.

No further study is recommended.

#### Reference Cited

Rimkunas, Barbara

2010 "The History Behind the 'Jailhouse Spring' in Exeter." <https://www.seacoastonline.com/article/20100528/News/5280337> Accessed June 24, 2021.

- Attach\* the relevant portion of a 7.5' USGS map (photocopied or computer-generated) indicating the defined project boundary location. If available, include GIS shapefiles of the survey area as well.
- Attach\* sketches, test pit location maps, field records, and any other applicable maps or images that would help the DHR understand the reason for the recommendations.
- DHR Records check completed on: 2021-06-18

\*Adobe Acrobat Pro users: Attachments can be merged with this PDF or attached by using the attachment function  
Adobe Acrobat Reader users: Include attachments in a separate PDF for electronic submittal

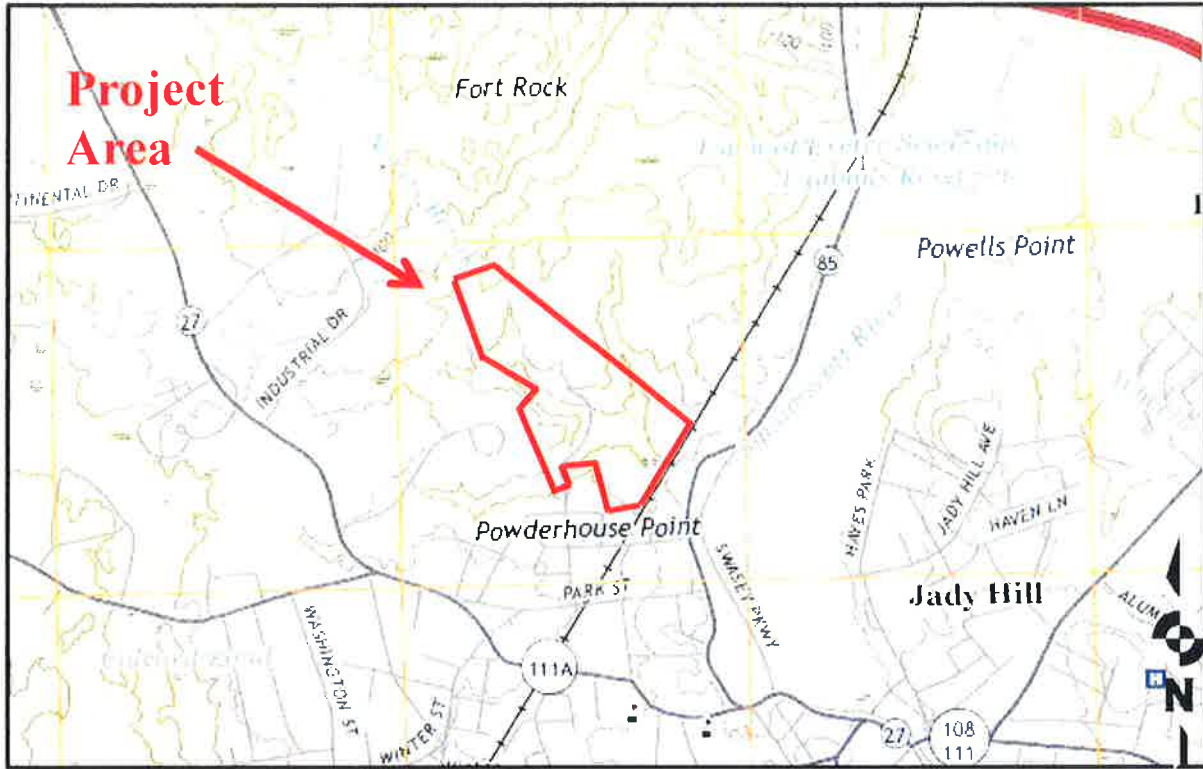


Figure 1. Project Area on USGS Exeter Quadrangle (1:25,000)

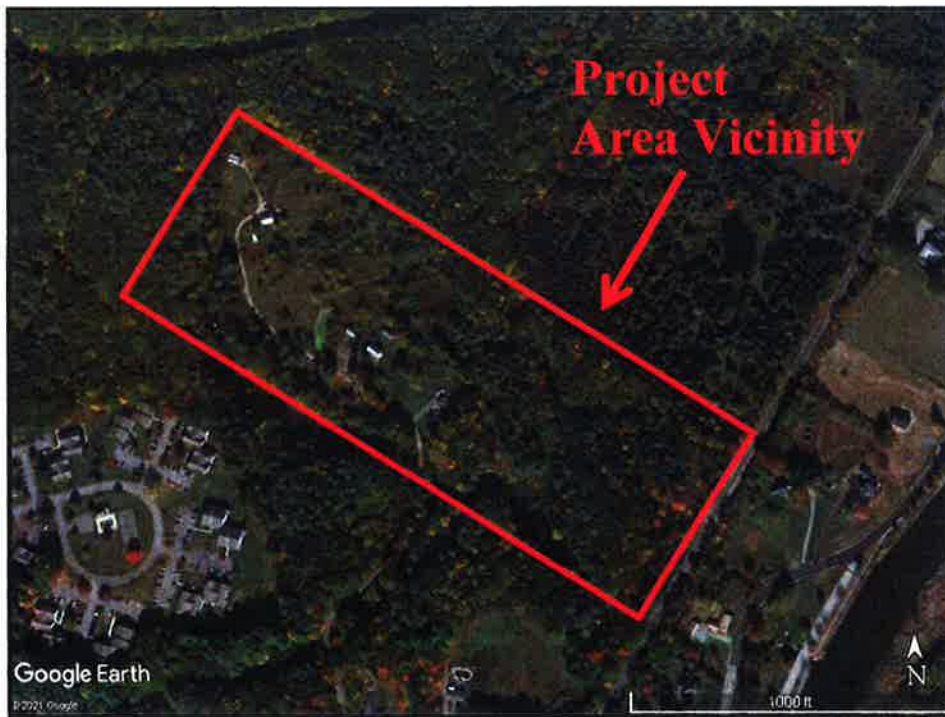


Figure 2. Project Area Vicinity on Aerial Photograph

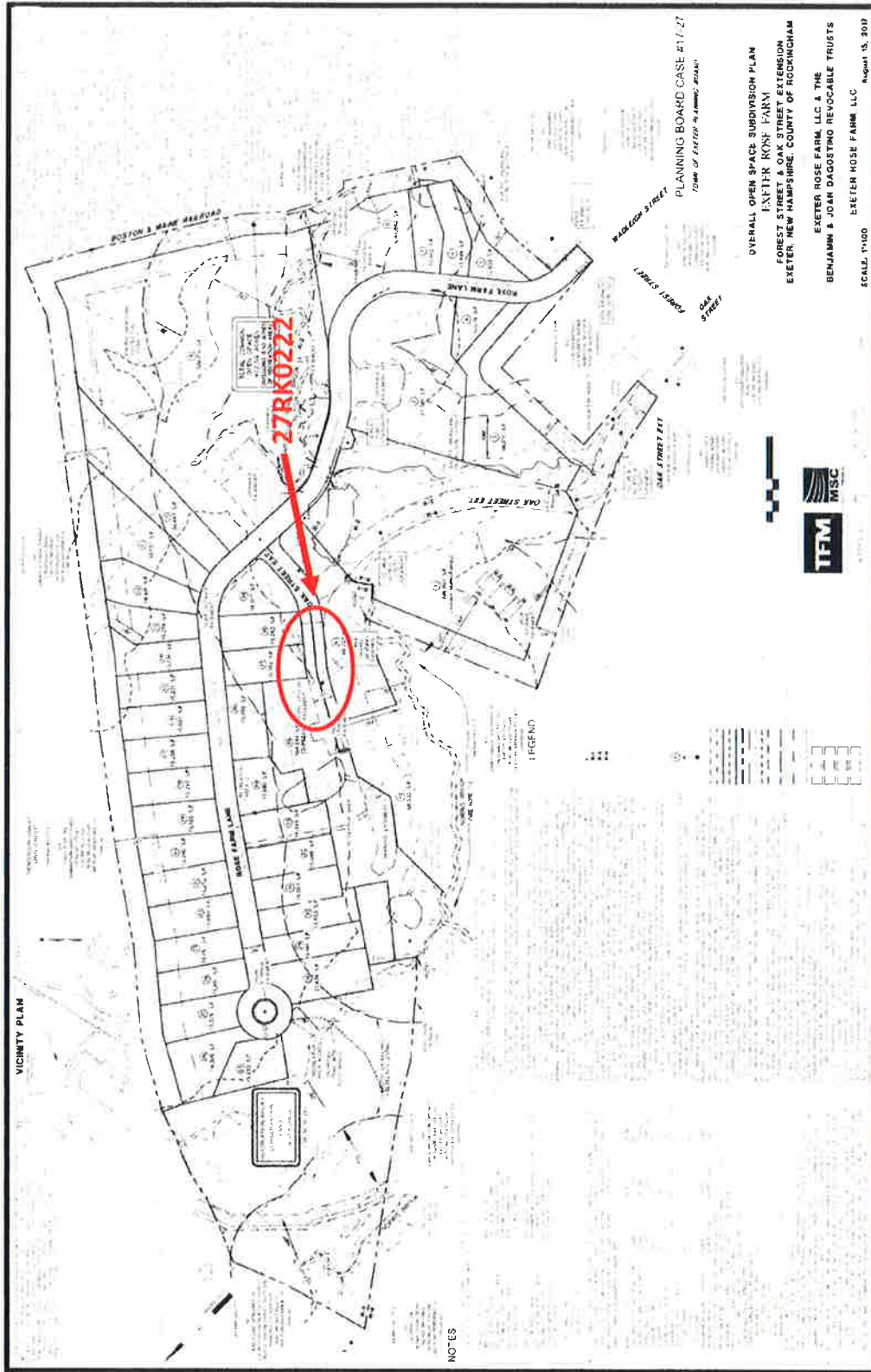


Figure 3. Project Plans and Location of Site 27RK0222



Figure 4. Project Area on 1857 Map of Exeter (Approximate Scale 1" = 3300'; Chase 1857)

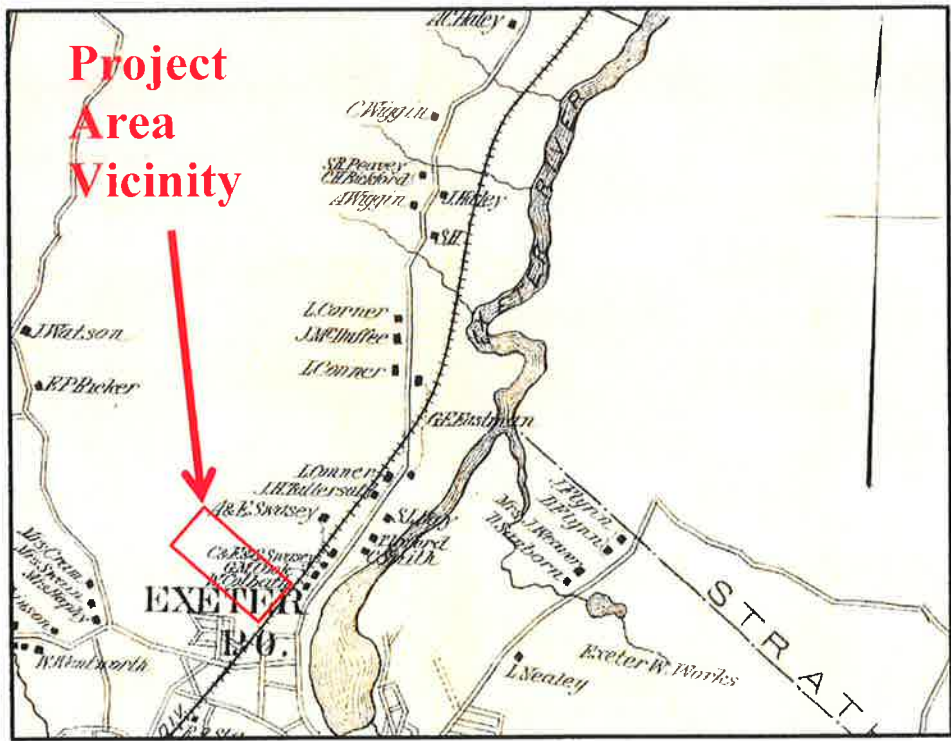


Figure 5. Project Area on 1892 Map of Exeter (Approximate Scale 1" = 3700'; Hurd 1892)





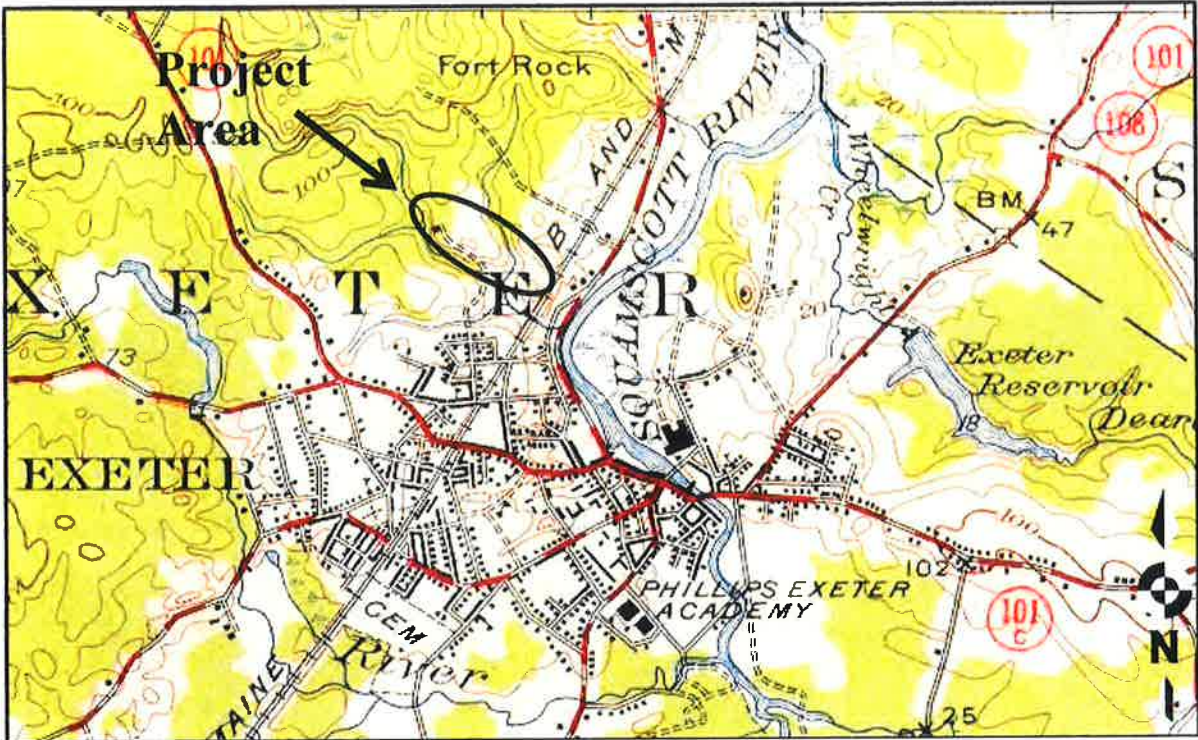


Figure 8. Project Area on 1932 USGS Exeter Quadrangle (1:62,500)



Figure 9. Project Area on 1992 Aerial Photographs Showing Footprint of Former Greenhouses



Plate 1. Northern End of Project Area with Parked Mobile Home, View Northwest



Plate 2. Disturbed Terrain and Monitoring Well, Northern Terminus of Project Area, View South



Plate 3. Soil Core, Northern Terminus of Project Area Showing Silty Soil and No A Horizon



Plate 4. Disturbed Terrain at Former Greenhouse Location, View Southeast



Plate 5. Push Piles at Former Greenhouse Location, View East



Plate 6. View South of Construction Debris, Northern End of Project Area



Plate 7. Soil Core from Former Greenhouse Location Showing Sandy Subsoil Terminating on Rock



Plate 8. Center of Project Area with Existing Structures in Background, View Southeast



Plate 9. View East of Disturbed Terrain North of Former Greenhouse Area



Plate 10. View South of Disturbed Terrain and Dumping, West End of Former Greenhouse Area



Plate 11. View Southeast of Oak Street Extension Showing Utility Poles



Plate 12. View Southeast of Old Asphalt Surface, Oak Street Extension





Plate 13. Area of Dumping and Disturbed Terrain, South End of Project Area, View Southwest



Plate 14. View East of Existing Structures and Location of Site 27RK0222



Plate 15. View Northeast of Retention Basin on North Side of Oak Street Extension



Plate 16. View East of Eastern End of Proposed House Lots



Plate 17. Norris Brook, View Southeast from Oak Street Extension



Plate 18. Wet, Uneven Terrain in Proposed Open Space Area, View East



Plate 19. View Southwest of Disturbed Terrain along Norris Brook



Plate 20. Railroad Corridor along Eastern Edge of Project Area, View North

ATTACHMENT B6-3

Heritage Commission

October 16, 2018

Draft Minutes

Members Present: John Merkle, Chairman, Julie Gilman, Pam Gjetum, Jay Myers, Maura Fay

Call Meeting to Order: John Merkle, Chairman, called meeting to order at 7:00 pm in the Wheelwright Room of the Exeter Town Office Building.

A resident who lives by the Rose Farm, came to the meeting, William Murphy. The board introduced themselves to him.

**Business:** John stated that the first discussion is about the consultant recommendations for Park/Cass Streets surveys. Julie told the commission that they got one response and it was from Lynn Monroe. The commission has a budget of \$20,000 for this project. Lynn does not know this and Julie stated this is something they can surprise her with. She gave a quote of \$20,000 to do it, with a note stating that this would really be a stretch. Julie said they have to meet with DHR to go over the extent of the project. Julie stated that the meeting has not yet been set up and she would be happy if someone other than herself would like to go or with her. Maura and John stated they would be available to go. Julie stated they would have to respond to Lynn Monroe. John asked if the commission would be waiting to hear back from DHR. Pam stated they would have to tell Lynn. Julie stated they would have to award her the grant and send her a letter and tell DHR who they have. Dave Sharpal will then set up the meeting with DHR. Maura then asked if the commission needed to vote on this since they only had one applicant. Julie stated that they probably should. Pam then made a motion to accept Lynn Monroe's application. Julie seconded. John asked if there was any further discussion. Julie stated that she will add that they only had one applicant response and she is a historical planner and the they have worked with her before. John stated that she is on their list. He then stated with no further discussion, all were in favor and the motion accepted.

Julie suggested that the next agenda be the discussion of the **Rose Farm** demolition recommendations. John stated that they met out there approximately two weeks ago and the structures that are out there now, they looked at pretty much all of them. Some of them will be reused, but he is not sure as to what extent. The mobile homes, the commission has no jurisdiction over and they are going anyway. Some of the buildings were in such a state of disrepair, they were not worth trying to rehabilitate. Julie stated that they also did not find a cemetery. Pam also stated that there is no cemetery there. She stated that the piece of stone that was found is a hunk of concrete. Julie stated that Keith Patterson showed the commission the piece of stone that was shown to him and it was just broken concrete. There was no sign of anything. Pam also stated that there was never any family there either. Pam showed the commission pictures of the buildings that were going to be torn down. She liked the little house. John stated they talked about sitting down with them to see if they would consider saving the garage. He stated that because of the brick work, it is unique to the town. Julie stated that she has been going back and forth with Keith Patterson to find a date where they can have that conversation. She said that he told her they had thought about it and much like the garage on Franklin Street, using some piece of it for something. John stated that they will have equipment out there for maintain

properties. Julie stated she asked him about this and it is not a condo association. Maura stated that it is a homeowners association. She stated that they may or may not have their own maintenance equipment. They may hire someone to do it. John stated that the condition of the two buildings are good. Julie stated she was looking at their site plan and understands it is all engineered out, but she thinks a little bit more curve around the garage would be good.

Maura asked out of curiosity what would happen on a big project like this if human remains are found of some kind. There is no documented cemetery, but it has been used for so long. Julie stated the work would stop for a little while and she is not sure if the State would then get involved. John stated that the State would get involved if it was a real cemetery. Pam stated that there are lots and lots of family graves in the back. Maura again stated that she was just wondering what the process was if something was found. Julie stated that the Selectmen are the Cemetery Trustees and they would be involved in some fashion. If a cemetery or grave site is found, it is up to the Trustees or the property owner to reach out to any remaining family members if they can find them. If no one is found or if found they are not interested, then it becomes the property of the town. Julie stated they will be doing an archaeologist survey. Maura then asked what this involves. Julie stated it involves test pits. They pick different areas and dig down around six inches. Pam then stated that this is not where the local tribes hung out. They were down by Kimball Road. John stated that the commission will wait to hear from Julie.

Next is the discussion considering HDC's concerns about the former **Ioka Theatre** and sending out a letter. Julie stated there was a conversation per e-mail regarding what could be done about the Ioka. It had to be made an agenda item. Discussion was there was concern about the tree growing out of the roof and broken window. The HDC thought it would be better coming from the Heritage Commission whose mission is to preserve and protect the heritage of the town. Just a simple letter to Allen Lewis, the owner, telling him about the concerns. Julie has not written up a letter about this. She stated that the Fire Department is concerned about one corner of the building separating. The tree has been removed or at least cut. John then asked if the letter should come from the town. Julie stated that this commission is the town. She also stated that they have been unsuccessful trying to reach Mr. Lewis. Recently, there have been some parties interested in purchasing the Ioka, but they have not been able to get inside to even look at it. There is also some concern that the mold in there has gotten so bad that no one will want to go in. There have been two offers made and no response. Mr. Lewis will not let his people have the authority to do any discussion at all. He has been waiting for the town to come up with some idea of what can be a public/private partnership. John stated that it is too late for that. Julie stated that one of the offers was going to be mostly private, but have a public advantage and be open to public use occasionally. This letter is aimed at telling him we are still looking at it and want something done there. We are concerned as time goes by, we will lose the opportunity. Pam asked if this letter should be from the town attorney. Julie stated that it is not a health threat yet. Julie stated that she asked Doug about it and he thinks it is fine for now. Pam asked who should write this letter. Julie stated that someone can start it because they are talking about it here at the meeting and it is a mission to write this letter, it can be passed around electronically, as long as they vote on it to send together. Pam will start this letter and what are the points they want covered. Julie stated they are concerned about the state of the structure and damage that has occurred over time. The HDC thought this would be good coming from the Heritage Commission because they are not regulatory. John stated that it is in a Registered National Historic District and the Heritage Commission considers it contributing to the district and are concerned about its condition. Julie suggested putting in the commission's mission which is to preserve and promote. Julie stated that this letter should ask him to get in touch to see how they can help.

Other Business: John asked about Fall clean-up at the cemetery. Julie stated that she never organized anything. Pam will be having some volunteers clean-up the Gas House Cemetery instead. It is in terrible shape and Winter Street Cemetery looks very good. Pam stated that Saturday morning, she will have the Key Club and a group from the academy both working there. Pam then stated that when she went to get permission from Parks and Recreations, they did not know anything about a cemetery up there. Julie stated that if the commission wanted to do more work at the Winter Street Cemetery, they could put in for another grant.

Julie mentioned that the etching of the dam has been in place now for a couple of months. She found this out at a Selectmen's Meeting. Julie was wondering if the commission would be interested in doing a ribbon cutting. The members thought this would be a good idea. Julie will throw out some dates for this.

John told the commission that he has not called PEA yet about 15 Grove Street. They are planning on meeting there 10:30 am on Thursday morning. Pam stated that it is not particularly historic. John stated that he looked at it on line and architecturally, there is nothing historic about it.

John asked if there was any other business and there was not and he asked for a motion to adjourn. Pam made the motion and Julie seconded. All were in favor and meeting adjourned at 7:30 pm.

Respectfully submitted,

Elizabeth Herrick  
Recording Secretary







Image 1 - Looking westerly at the proposed Norris Brook 5' X 24' box culvert (Impact K1/K2) crossing from downstream. Note the concrete weir and pond in the background. Refer to Figure 1. ©Jacobs 2018



Image 2 – Looking westerly /upstream at Norris Brook from just downstream of the proposed 5' X 24' box culvert. Note the bricks in the stream. Refer to Figure 1. ©Jacobs2018



Image 3 – Looking southeasterly at the proposed 5' X 24' box culvert crossing from the concrete weir. Note Norris Brook in left center foreground. Refer to Figure 1. ©Jacobs2018



Image 4 – Looking northeasterly at proposed 5' X 24' box culvert crossing from the concrete weir. Note the standing dead floodplain forest in background and pipe in the foreground. Refer to Figure 1. ©Jacobs2018



Image 5 – Looking westerly at the concrete weir from Norris Brook. Note the pipe in foreground and impounded man-made pond in the background. Refer to Figure 1. ©Jacobs2018



Image 6 – Looking northwesterly at the concrete weir. Note the pipe on lower right in the foreground and flooded man-made pond in the background. Refer to Figure 1. ©Jacobs2018



Image 7 – Looking southeasterly from Oak St. Ext. and culvert D4 at the impounded man-made pond. Note the concrete weir and Norris Brook 5' X 24' box culvert crossing slightly left of center in the background. Note the sediment plume covered with emergent / aquatic vegetation in the center. Refer to Figure 4. ©Jacobs2018



Image 8 – Looking northerly at man-made Wetland C. Note concrete slabs (typical). Refer to Figure 2. ©Jacobs2018



Image 9 – Looking westerly at man-made Wetland D. Note Wetland E on left in background. Refer to Figure 2.  
©Jacobs2018



Image 10 – Looking westerly at man-made Wetland D. Dominant vegetation is poison ivy. Note Wetland E on left in background. Refer to Figure 2. ©Jacobs2018



Image 11 – Looking northerly at man-made wetland Wetland E. Note the automobile tire on the left. Refer to Figure 2. ©Jacobs2018



Image 12– Looking southerly at man-made pond Wetland F. Note Oak St. Ext.(between Wetland F and dwelling), Man-made Wetland H on right in background (opposite side of Oak St Ext). Refer to Figure 2. ©Jacobs2018



Image 13– Looking northerly at man-made Wetland G (hydric soils) in the foreground (at the bottom of the image). Note the pink flag and solid waste (typical). Refer to Figure 2. ©Jacobs2018



Image 14– Looking southerly at man-made Wetland H from Oak St. Ext. Note the reinforced concrete culvert section installed vertically (yellow arrow). Refer to Figure 2. ©Jacobs2018



Image 15 – Looking east @ Oak St Ext (just behind dogwood shrubs) & upstream end of culvert D3. Refer to Figure 3. ©Jacobs2021



Image 16 – Looking west (upstream) from Oak St Extension at culvert D3. Refer to Figure 3. ©Jacobs2021





Image 17 – Looking east (downstream) from Oak St Ext at culvert D3. Note knotweed on stream banks. Refer to Figures 3 and 6. ©Jacobs2021



Image 18 – Looking west (upstream) at Oak St Ext & culvert D3. Note knotweed on stream banks. Jack McTigue is standing at the culvert. Refer to Figure 3. ©Jacobs2021



Image 19 – Looking west (upstream) at culvert D3. Refer to Figure 3. ©Jacobs2021



Image 20 – Looking north (upstream) at culvert D4 and Oak Street Extension (in the background) from the concrete weir. Note pump house on right. Refer to Figure 1. ©Jacobs2018



Image 21 – Looking southwesterly at the downstream end of culvert D4 from the pump house. Refer to Figure 4.  
©Jacobs2018



Image 22 – Looking west (upstream) from culvert D4 and Oak Street Extension. Refer to Figure 4. ©Jacobs2018



Image 23 – Looking at upstream end of culvert D4. Note culvert is almost running full; compare to image 21. Refer to Figure 4. ©Jacobs2018



Image 24 – Looking at downstream / plugged end of culvert D2 (yellow arrow). 142 SF of impact to Wetland J proposed here for replacement of culvert D2. Refer to Figure 3. Note pink wet flag. ©Jacobs2021



Image 25 – Looking at upstream / plugged end of culvert D2 (yellow arrow). 118 SF of impact to Wetland K proposed here for replacement of culvert D2. Refer to Figure 3. ©Jacobs2021



Image 26 – Looking north from Oak Street Extension at 118 SF of proposed impact to Wetland K for replacement of culvert D2. Note tree on left. Refer to Figure 3. ©Jacobs2021



Image 27 – Looking south at 118 SF of proposed impact to Wetland K for replacement of culvert D2. Note Oak Street Extension and tree from image 26 on right. Refer to Figure 3. ©Jacobs2021



Image 28 – Looking at breach in concrete weir and general location of proposed repair and installation of fish ramp. (This is just left of weir as shown in image 6.) Refer to Figure 1. ©Jacobs2021



Image 29 – Looking west at impact area K3. Refer to Figure 5. ©Jacobs2021



Image 30 – Looking south / uphill at impact area K4. Note pink wet flag. Refer to Figure 5. ©Jacobs2021



Image 31 – Looking southwest at impact area K5 at the edge of Wetland M, which is primarily wet meadow but has a fringe of scrub-shrub / sapling wetland. Refer to Figure 5. ©Jacobs2021



Image 32 – Looking south / upstream at the intermittent stream which drains wetland M and is proposed to be piped. Note the bricks and brick fragments. Refer to Figure 5. ©Jacobs2021





Image 33 – Looking north at wetland impact area K6 adjacent to the terminus of the intermittent stream which drains wetland M. Refer to Figure 5. ©Jacobs2021



Image 34 – Looking east at the 'Jailhouse Spring' house. Refer to Figure 6. ©Jacobs2021

### PHOTOGRAPH LOCUS

FIGURE 1 (TF Moran Plan Sheet W-02)

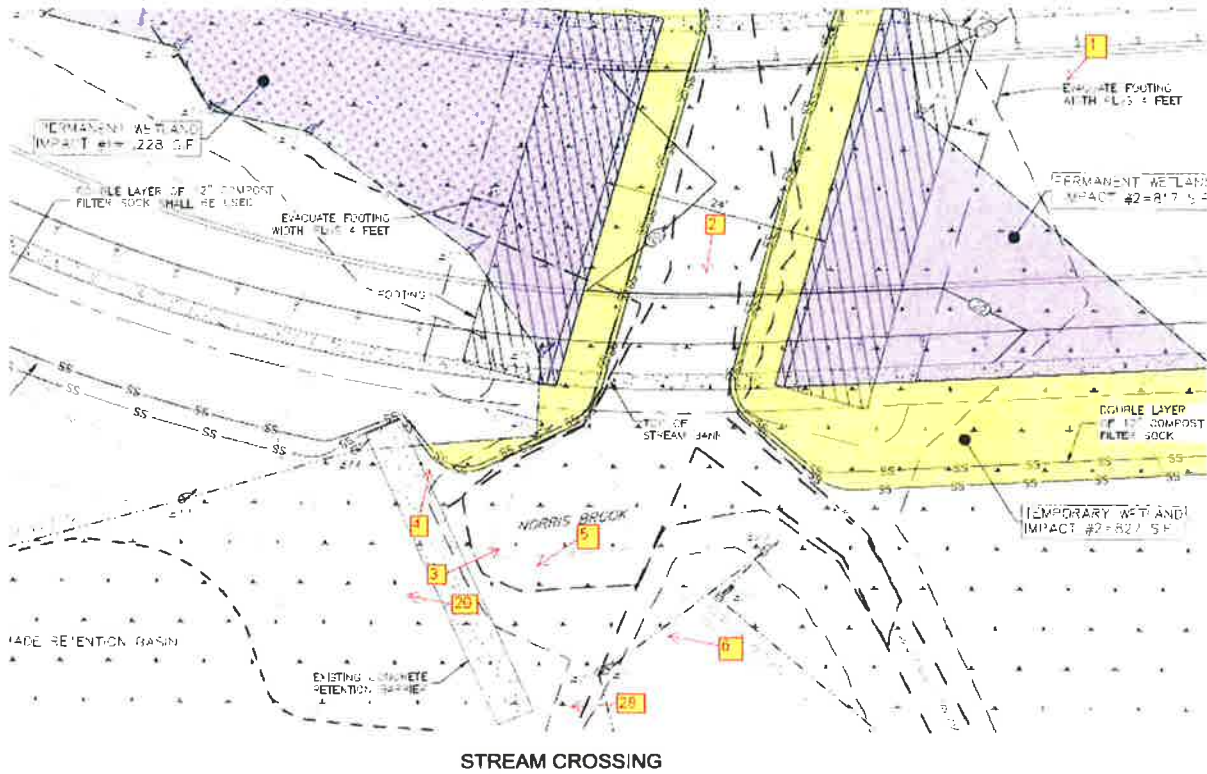


FIGURE 2 (TF Moran Plan Sheet W-01)

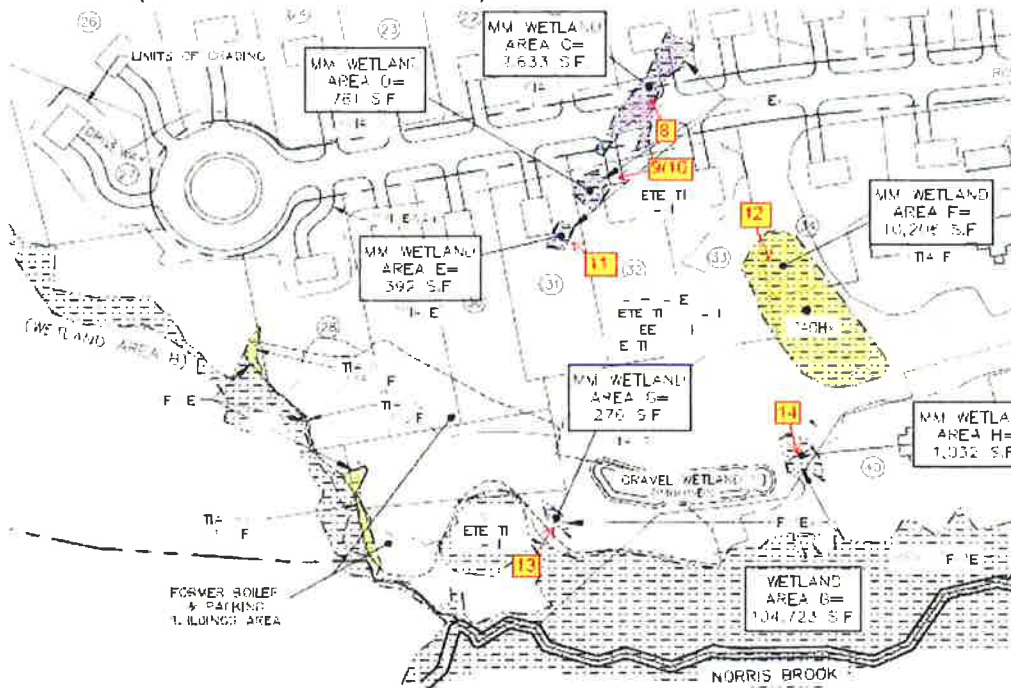


FIGURE 3 (Ross Engineering Plan Sheet S1)

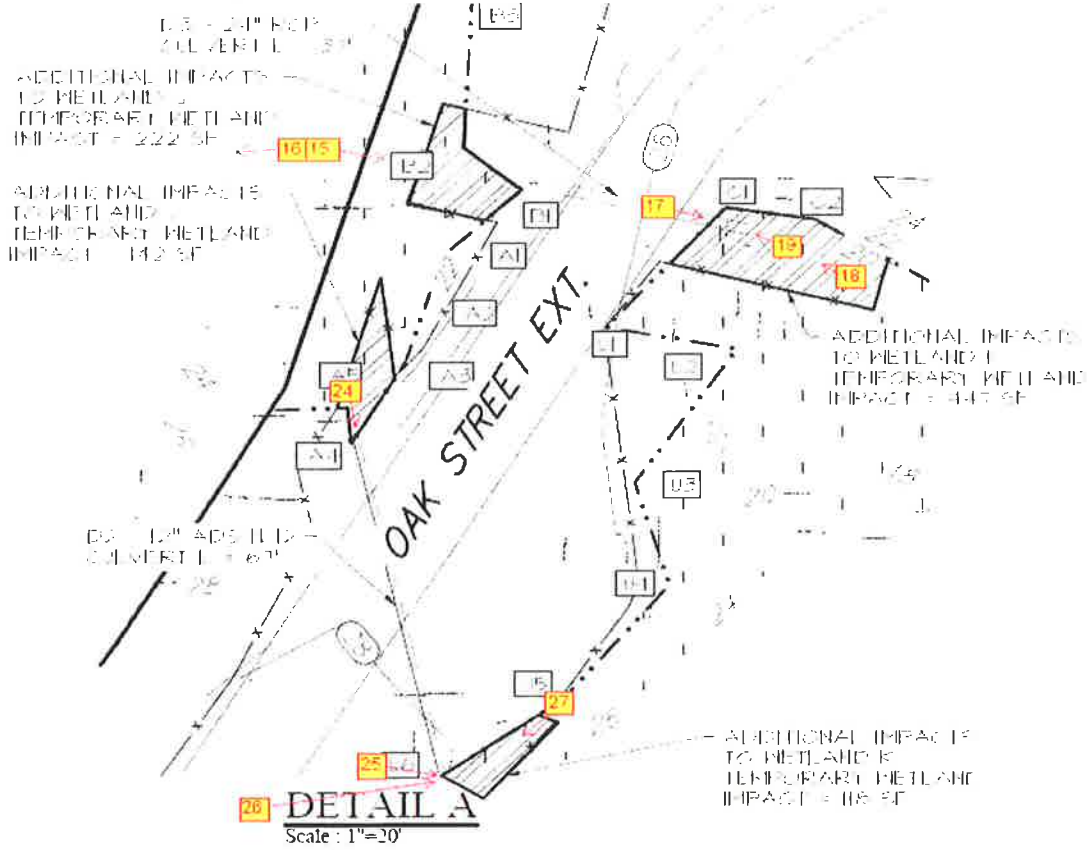


FIGURE 4 (Ross Engineering Plan Sheet S4)

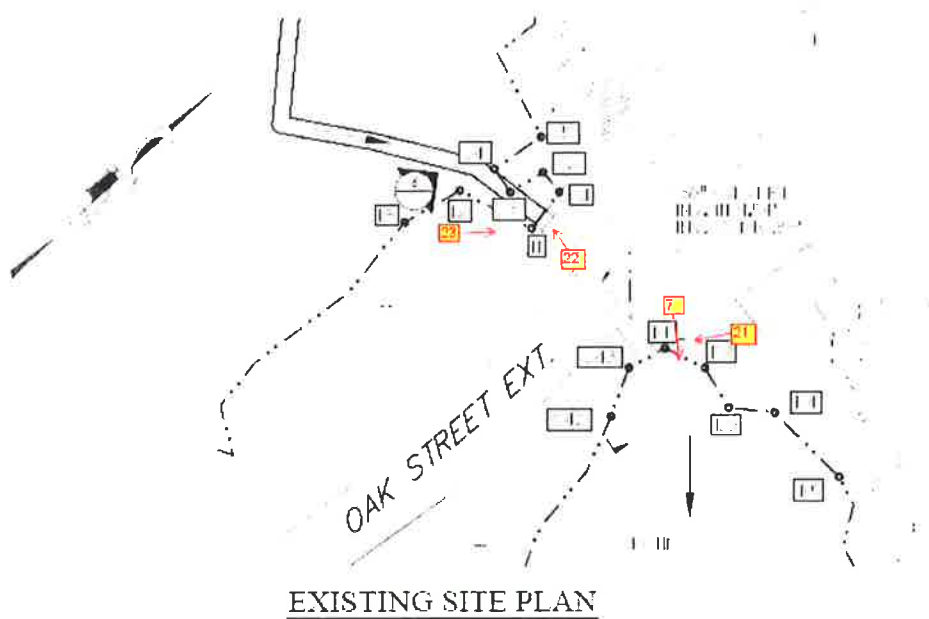


FIGURE 5 (TF Moran Plan Sheet W-01)

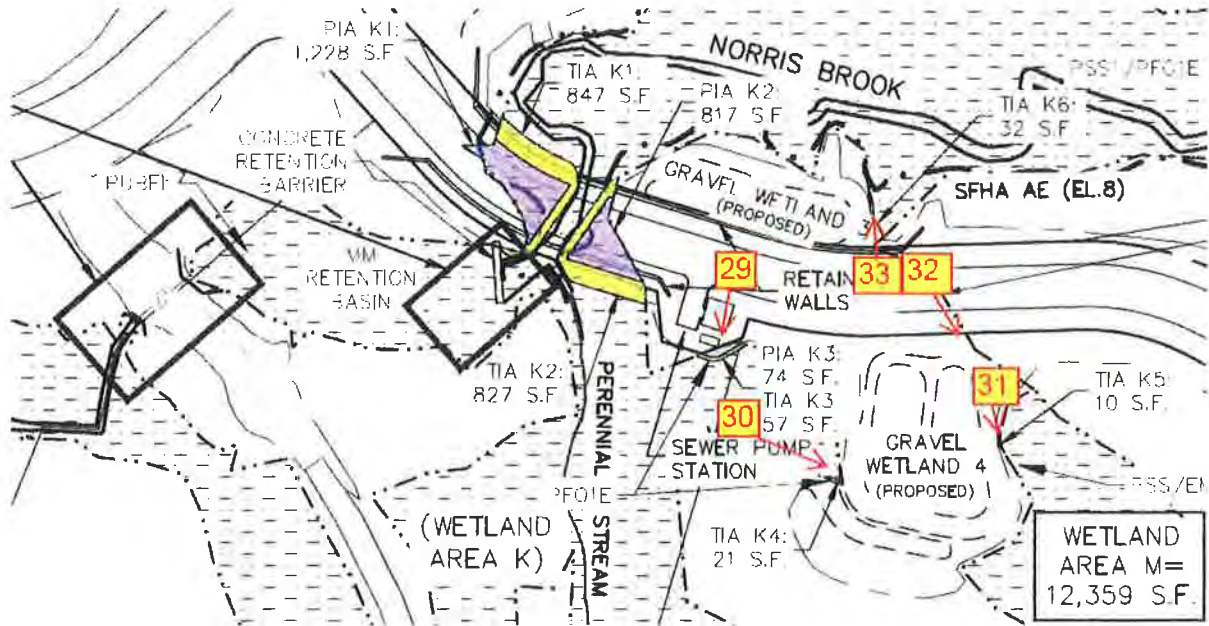
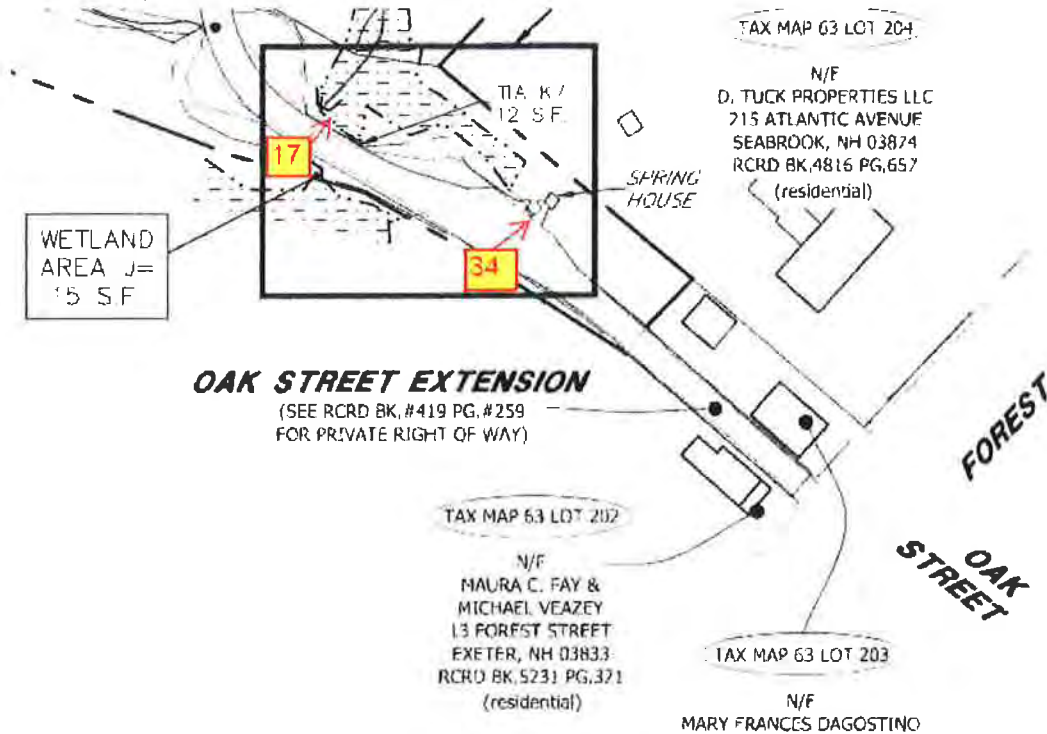


FIGURE 6 (TF Moran Plan Sheet W-01)





48-5

ATTACHMENT C1-1



- Parcels
- State Boundary
- US Highway
- State Highway
- Interstate
- NH Highway
- Parcel Streams
- Open Water
- Buildings
- Adjoining Towns
- Streets (Updated Feb 2015)
- Misc Streams

49-8

53-4

Exeter Rose Farm LLC

OAK STREET

BROOKSIDE DR

BROOKSIDE DR

54-1

54-2-1

55-75-200

75-4

55-75-100

54-4

54-6

54-7

54-5

63-205

The data shown on this site are provided for informational and planning purposes only. The town and its consultants are not responsible for the misuse or misinterpretation of the data.



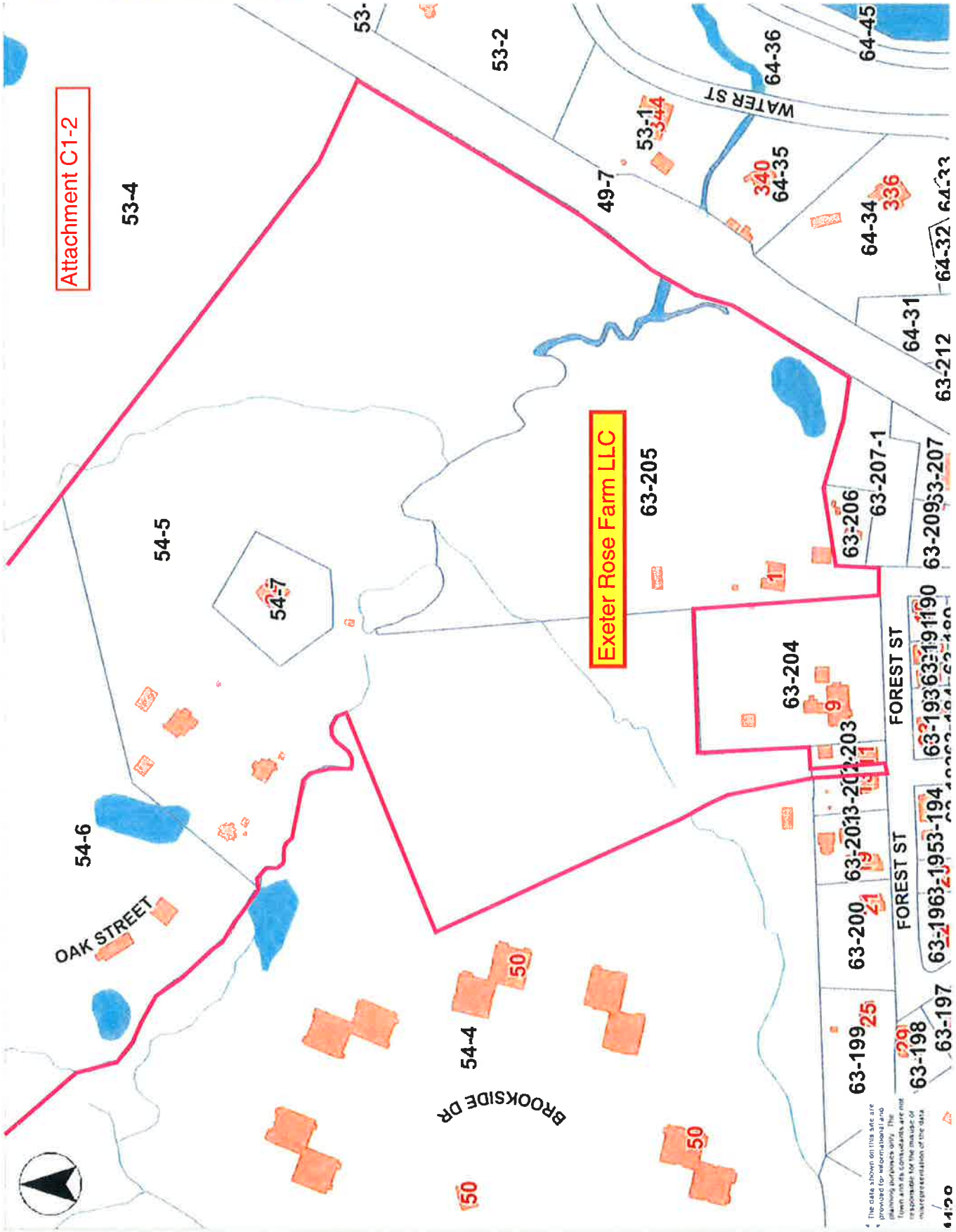
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Exeter MapsOnline



- Parcels
- NH Highway
- US Highway
- State Highway
- Town Boundary
- Abutting Towns
- Streets (Updated Feb 2018)
- Mac Streams
- Parcel Streams
- Open Water
- Buildings

Attachment C1-2



Exeter Rose Farm LLC

4. The data shown on this site are provided for informational and planning purposes only. The town and its consultants are not responsible for the misuse or misrepresentation of the data.

0 320 640 ft

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Civil Engineers  
 Structural Engineers  
 Traffic Engineers  
 Land Surveyors  
 Landscape Architects  
 Scientists

ATTACHMENT C3

# Abutters List

**Exeter Rose Farm  
 Forest & Oak Street Extension  
 Exeter, NH 03833**

Date: **June 22, 2021**  
 Project #: **47175.00**

Assessors Map		Abutter Name	Mailing Address
Map	Lot		
LOCUS 54	5	Exeter Rose Farm LLC	953 Islington Street #23D Portsmouth, NH 03801
LOCUS 54	6	Exeter Rose Farm LLC	Same as Map 54 Lot 5
LOCUS 54	7	Exeter Rose Farm LLC	Same as Map 54 Lot 5
LOCUS 63	205	Benjamin Dagostino Revocable Trust & Joan Dagostino Revocable Trust	1 Forest Street Exeter, NH 03833
54	1	SIG SAUER, INC.	18 Industrial Drive Exeter, NH 03833
54	4	Norris Brook Condominiums c/o Great North Property Management	3 Holland Way, Suite 201 Exeter, NH 03833
53	4	John P. & Teresa Toomey Family Revocable Trust	2 Newfields Road Exeter, NH 03833
48	5	East Coast Ventures, Inc. c/o Integrated Realty Resources	8025 S. Willow St. Suite 209 Manchester, NH 03103
49	7	Boston and Maine Railroad Corporation	1700 Iron Horse Park North Bellica, MA 01862-1681
49	8	Town of Exeter Henderson Swasey Forest	10 Front Street Exeter, NH 03833
63	190	Exeter Rose Farm LLC	Same as Map 54 Lot 5





Civil Engineers  
 Structural Engineers  
 Traffic Engineers  
 Land Surveyors  
 Landscape Architects  
 Scientists

## Abutters List - cont.

Assessors Map		Abutter Name	Mailing Address
Map	Lot		
63	202	Maura C. Fay & Michael Veazey	13 Forest Street Exeter, NH 03833
63	203	Mary Frances Dagostino	11 Forest Street Exeter, NH 03833
63	204	D. Tuck Properties, LLC	215 Atlantic Avenue Seabrook, NH 03874
63	206	Exeter Rose Farm LLC	Same as Map 54 Lot 5
63	207-1	Exeter Rose Farm LLC	Same as Map 54 Lot 5

Civil Engineers / Surveyor	TFMoran, Inc.-Seacoast Division 170 Commerce Way – Suite 102 Portsmouth, NH 03801
Professional Wetland / Soil Scientist	Marc E. Jacobs 609 Portsmouth Avenue – P.O. Box 417 Greenland, NH 03840-0417







Marc E. Jacobs, *CSS, CWS, PWS, CPESC*  
Professional Wetland / Soil Scientist  
[jacobs2wetsoil2004@yahoo.com](mailto:jacobs2wetsoil2004@yahoo.com)

Via First Class Mail Certified

September, 2021

**Re: Exeter Rose Farm, LLC  
Forest Street and Oak Street Extension  
Assessors Map 54, Lots 5-7 and Map 63, Lots 190 & 205  
Exeter, NH**

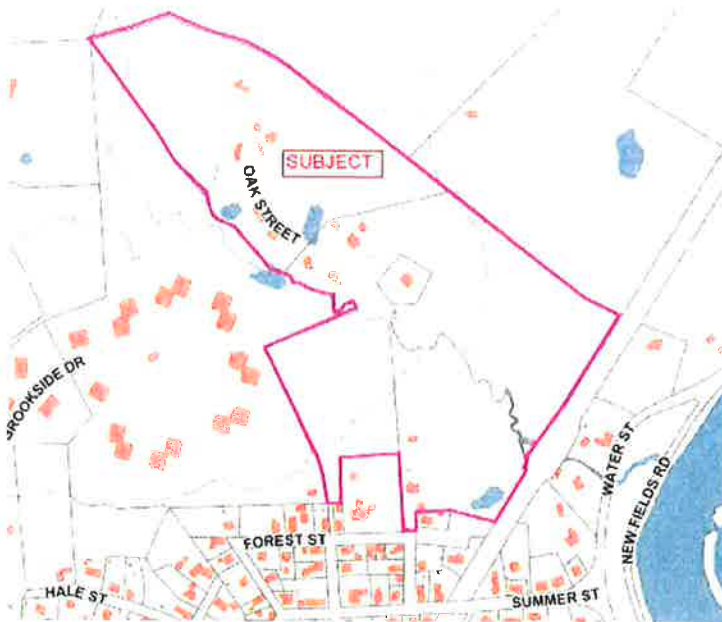
Dear Abutter,

The purpose of this letter is to notify you that, on behalf of the above-referenced landowner, we are submitting a permit application to the New Hampshire Department of Environmental Services (NHDES) - Wetlands Bureau for approval to install a box culvert and replace three other culverts as needed to provide access at this location. The construction will impact wetland areas under the jurisdiction of the Wetlands Bureau; therefore, as a direct abutter to the subject property identified above, you are being notified via certified mail as required by NH RSA 482-A:3.

The wetland permit application and supporting materials are being submitted and will be available for your review at the Exeter Town Hall approximately one week after your receipt of this letter. Please feel free to contact me directly at 603-686-5097 with any questions. You may also contact the New Hampshire Wetlands Bureau at 603-271-2147 or the Exeter Conservation Commission and Kristen Murphy, Natural Resource Planner at 603-418-6452 for more information. A snippet of the GIS tax map indicating the subject properties is included below for your reference.

Cordially,

Marc Jacobs, CWS, CSS, CPESC



609 Portsmouth Avenue  
PO Box 417  
Greenland, NH 03840-0417

Phone (603) 686-5097  
Fax (603) 686-5142  
Mobile (603) 534-SOIL (7645)



7018 1130 0000 5724 2922

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Seabrook, NH 03874

Certified Mail Fee	\$3.75
Extra Services & Fees (check box, add fee as appropriate)	\$0.00
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total</b>	<b>\$4.33</b>



09/28/2021

D. Tuck Properties, LLC  
215 Atlantic Avenue  
Seabrook, NH 03874

7018 1130 0000 5724 2908

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Exeter, NH 03833

Certified Mail Fee	\$3.75
Extra Services & Fees (check box, add fee as appropriate)	\$0.00
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total</b>	<b>\$4.33</b>



09/28/2021

Maura C. & Michael Veazey  
13 Forest Street  
Exeter, NH 03833

7018 1130 0000 5724 2915

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Certified Mail Fee	\$3.75
Extra Services & Fees (check box, add fee as appropriate)	\$0.00
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total</b>	<b>\$4.33</b>



09/28/2021

Mary Frances Dagostino  
11 Forest Street  
Exeter, NH 03833

7018 1130 0000 5724 2892

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<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total</b>	<b>\$4.33</b>



09/28/2021

Town Of Exeter  
Henderson Swasey Forest  
10 Front Street  
Exeter, NH 03833

7018 1130 0000 5724 2885

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North Billerica, MA 01862

Certified Mail Fee	\$3.75
Extra Services & Fees (check box, add fee as appropriate)	\$0.00
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total</b>	<b>\$4.33</b>



09/28/2021

Boston & Main Railroad Corporation  
1700 Iron Horse Park  
North Billerica, MA 01862-1681

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Manchester, NH 03103

Certified Mail Fee	\$3.75
Extra Services & Fees (check box, add fee as appropriate)	\$0.00
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total</b>	<b>\$4.33</b>



09/28/2021

East Coast Ventures, Inc.  
c/o Integrates Realty Resources  
8025 S. Willow St., Suite 209  
Manchester, NH 03103

7018 1130 0000 5724 2861

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Exeter, NH 03833

Certified Mail Fee	\$3.75
Extra Services & Fees (check box, add fee as appropriate)	\$0.00
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<input type="checkbox"/> Return Receipt (electronic)	\$0.00
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<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total</b>	<b>\$4.33</b>

Postmark Here  
 SEP 28 2021 04  
 ROLLINSFORD NH 03869

09/28/2021

John P. & Teresa Toomey  
 Family Revocable Trust  
 2 Newfields Road  
 Exeter, NH 03833

Instructions

7018 1130 0000 5724 2854

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<input type="checkbox"/> Return Receipt (electronic)	\$0.00
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<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total</b>	<b>\$4.33</b>

Postmark Here  
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 ROLLINSFORD NH 03869

09/28/2021

Norris Brook Condominiums  
 c/o Great North Property Management  
 3 Holland Way, Suite 201  
 Exeter, NH 03833

Instructions

7018 1130 0000 5724 2847

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Exeter, NH 03833

Certified Mail Fee	\$3.75
Extra Services & Fees (check box, add fee as appropriate)	\$0.00
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total</b>	<b>\$4.33</b>

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09/28/2021

Sig Sauer, Inc.  
 18 Industrial Drive  
 Exeter, NH 03833

Instructions

7017 3380 0000 3557 8492

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Exeter, NH 03833

Certified Mail Fee	\$3.75
Extra Services & Fees (check box, add fee as appropriate)	\$0.00
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total</b>	<b>\$4.33</b>

Postmark Here  
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 ROLLINSFORD NH 03869

09/28/2021

Benjamin Dagostino Revocable Trust  
 & Joan Dagostino Revocable Trust  
 1 Forest Street  
 Exeter, NH 03833

Instructions

7017 3380 0000 3557 8485

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For delivery information, visit our website at [www.usps.com](http://www.usps.com)

Portsmouth, NH 03801

Certified Mail Fee	\$3.75
Extra Services & Fees (check box, add fee as appropriate)	\$0.00
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.58
<b>Total Postage and Fees</b>	<b>\$4.33</b>

Postmark Here  
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 ROLLINSFORD NH 03869

09/28/2021

Exeter Rose Farm LLC  
 953 Islington Street, #23D  
 Portsmouth, NH 03801

Instructions