

**THE STATE OF NEW HAMPSHIRE**  
**BEFORE THE**  
**NEW HAMPSHIRE SITE EVALUATION COMMITTEE**  
**DOCKET NO. 2015-06**

**SUPPLEMENTAL PRE-FILED TESTIMONY OF LEE CARBONNEAU**

**IN SUPPORT OF THE**  
**APPLICATION OF NORTHERN PASS TRANSMISSION LLC**  
**AND PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE**  
**D/B/A EVERSOURCE ENERGY**  
**FOR A CERTIFICATE OF SITE AND FACILITY TO CONSTRUCT A NEW**  
**HIGH VOLTAGE TRANSMISSION LINE AND RELATED FACILITIES IN**  
**NEW HAMPSHIRE**

**April 17, 2017**

1           **Q.     Please state your name and business address.**

2           A.     My name is Lee E. Carbonneau. My business address is 25 Nashua Road, Bedford, NH  
3 03110.

4           **Q.     Who is your current employer and what position do you hold?**

5           A.     My current employer is Normandeau Associates, Inc., where I am a Senior Principal  
6 Scientist in the Wetlands/Terrestrial Group. I am Normandeau’s assistant project manager and  
7 permitting lead for the Northern Pass Transmission Project (“Northern Pass” or the “Project”) as  
8 proposed by Northern Pass Transmission LLC (“NPT”) and Public Service Company of New  
9 Hampshire d/b/a Eversource Energy (“PSNH”) (collectively the “Applicants”). My testimony  
10 addresses wetland and aquatic resources, permitting, and proposed mitigation.

11          **Q.     What is the purpose of your supplemental testimony?**

12          A.     The purpose of my supplemental testimony is to provide additional information  
13 regarding the assessment of the potential effects of Northern Pass on wetland resources (including  
14 wetlands, streams and vernal pools), shoreland permitting, and aquatic resources (including cold water  
15 fisheries and mussels) since submittal of my original testimony. I conclude with an affirmation of my  
16 previous opinion that Northern Pass will not cause an unreasonable adverse effect on water quality or  
17 on the natural environment.

18          **Q.     First, please explain the significance of the March 1, 2017 Final Decision from the  
19 New Hampshire Department of Environmental Services (“NHDES”).**

20          A.     NHDES’s approval of the four sets of permit applications (Wetlands, Alteration of  
21 Terrain, Shoreland, and the Section 401 Water Quality Certification) indicates that Northern Pass has  
22 satisfied all of the state water quality-related permit requirements. As part of its decision, NHDES  
23 imposed various standard and project-specific conditions that are customary for these permits,  
24 requiring, among other items, that the Project and its contractors follow avoidance and minimization  
25 measures and BMPs, that the Project submit various monitoring plans prior to construction, and that  
26 the Project employ properly trained environmental monitors during construction.

27          **Q.     Have you conducted any additional studies or analyses since the submission of  
28 your Pre-filed Direct Testimony on October 16, 2015?**

29          A.     Yes. Normandeau scientists have conducted additional site surveys and analyses, and  
30 provided additional information and permit applications to state and federal resource agencies.

1           **Q.     Please summarize the additional Normandeau studies and analyses.**

2           A.     Normandeau scientists have:

- 3           •     Extended wetland mapping beyond the Project ROW/property in compliance with the  
4                 new SEC rules at two levels of detail (National Wetland Inventory (NWI) mapping, and  
5                 NWI plus Photo-interpretation).
- 6           •     Addressed specific comments and data requests from NHDES in their May 2016  
7                 progress report to the SEC, including the following information provided in submittals  
8                 on July 12, 2016 (App. Ex. 62); July 15, 2016 (App. Ex. 63); July 18, 2016 (App. Ex.  
9                 64); July 28, 2016 (App. Ex. 67); August 11, 2016 (App. Ex. 69); December 14, 2016  
10                (App. Ex. 72); and January 25, 2017 (App. Ex. 74):
- 11                 ○     An evaluation of culverts along the proposed off-ROW access roads (logging  
12                         roads) that were likely permitted by others through a forestry permit by  
13                         notification process, and therefore likely did not conform to current NHDES  
14                         stream rules. Normandeau worked with engineers from VHB, Inc. to collect  
15                         relevant stream data for culvert design and submitted a wetland application for  
16                         the replacement, repair or re-installation of 29 culverts;
- 17                 ○     Botanical, wildlife habitat, and Phase I Site Assessment surveys on the proposed  
18                         mitigation sites in order to address specific questions raised by NHDES and  
19                         New Hampshire Natural Heritage Bureau (“NHNHB”);
- 20                 ○     An updated Natural Resource Compensatory Mitigation Plan submitted to the  
21                         NHDES and NHSEC on December 14, 2016 (App. Ex. 72);
- 22                 ○     Additional wetland permitting plan sheet notes for wildlife and plant protection  
23                         measures, wetland and riparian restoration, and monitoring requirements; and
- 24                 ○     Redesigned plans developed with the Project engineers that shift the location of  
25                         several structures, access roads, and work pads to further reduce impacts to  
26                         wetlands and vernal pools by 76,009 sf (temporary impacts) and 732 sf  
27                         (permanent impacts) (App. Ex. 74).
- 28           •     Evaluated 21 possible mitigation sites for Karner blue butterfly habitat potential,  
29                 reviewed some of these sites with wildlife resource agency personnel, identified the  
30                 most ecologically appropriate available parcel, obtained concurrence from the New  
31                 Hampshire Fish and Game Department (“NHF&G”), U.S. Fish and Wildlife Service

1 (“USFWS”), U.S. Environmental Protection Agency (“USEPA”) and NHDES that the  
2 site would provide sufficient habitat conservation for Karner blue butterfly and  
3 provided a baseline documentation report for the selected 6.9 acre site to NHDES on  
4 December 14, 2016 (App. Ex. 72);

- 5 • Accompanied NHDES and USACE personnel on a site walk of the mitigation parcels  
6 on November 30, 2016 and December 1, 2016 (see the update to Appendix 48,  
7 Regulatory Agency Consultation Summary Table, on the Applicants’ Track 2 Exhibit  
8 List);
- 9 • Evaluated the proposed and existing ROW for locations where ground clearances would  
10 be sufficient to allow taller vegetation to remain under the overhead lines, thereby  
11 connecting forested habitats on either side of the ROW with taller cover ROW crossings  
12 for wildlife, as requested by NHF&G. A report identifying nine such locations was  
13 submitted to NHF&G on November 11, 2016 and is included in the Final Mitigation  
14 Report submitted to DES on December 14, 2016. (App. Ex. 72);
- 15 • Performed additional survey of two potential Exemplary Natural Communities along  
16 the new overhead route and provided the data to the NHNHB at their request; and
- 17 • Worked with Project engineers to shift work pads and access roads as requested by the  
18 NHNHB to further reduce temporary impacts to a threatened plant species in Concord  
19 by 1,677 sf and completely avoiding impacts to another species.

20 **Q. Have the Applicants filed new or revised wetlands applications with State and**  
21 **federal agencies?**

22 A. Yes, Normandeau submitted a request to revise previously submitted applications under  
23 the NH Shoreland Water Quality Protection Act (SWQPA, RSA 483-B) for the Pemigewasset River in  
24 Campton and Woodstock to address a reference line issue, and a new shoreland application for the  
25 same reason in Thornton, on May 10, 2016 (App Ex. 3). Three new wetland permit applications and  
26 two shoreland applications were submitted for geotechnical exploration work at Transition stations 1  
27 and 5 and the Deerfield Substation expansion area in August 2016. These applications for  
28 geotechnical work were approved and the work was completed. Normandeau submitted a request to  
29 NHDES Wetlands Bureau on December 14, 2016 to modify the wetland permit application materials  
30 to include the replacement or reinstallation of 29 culverts along off-ROW access roads in accordance  
31 with RSA 482-A and Env Wt 100-900 and under Section 404 of the Clean Water Act as administered

1 by USACE. A request to revise the shoreland application for the Connecticut River in Pittsburg also  
2 was submitted based on engineering changes made in response to AOT comments on January 25,  
3 2017.

4 Last, a summary of the changes in wetland impact quantities and application fees associated  
5 with the proposed culvert replacements and Northern Pass design modifications was provided to  
6 NHDES on February 10, 2017.

7 **Q. Are there any changes to the wetlands mitigation package?**

8 A. Yes. The natural resource mitigation plan now includes a specific 6.9 acre parcel of  
9 early successional pine barrens habitat that the NHF&G and USFWS agree is suitable compensation  
10 for construction impacts to Karner blue butterflies, and these agencies along with NHHNB also  
11 provided input into the Pine Barrens ROW Vegetation Management Plan that will be implemented in  
12 portions of Concord and Pembroke to protect and enhance habitat for Karner blue butterflies, wild  
13 lupine and other pine barrens species. The compensatory mitigation plan no longer includes a  
14 preservation parcel in New Hampton on the Pemigewasset River, as the site was found to be  
15 encumbered by its association with generation facilities. Mitigation in the Pemigewasset River  
16 watershed will now be addressed through an ARM fund payment in the amount of \$308,944.25. The  
17 revised mitigation package now includes a total ARM fund payment of \$3,379,280.59 for impacts in  
18 watersheds with no preservation parcels, and the preservation of 1,628 acres of land in Pittsburg,  
19 Clarksville, Stewartstown, Dixville, Columbia, Concord, and Pembroke with forested and shrub  
20 wetlands, low elevation spruce-fir forest, high elevation spruce-fir forest, perennial, intermittent and  
21 ephemeral streams, vernal pools, and some field and old field habitats. The preservation area is over 8  
22 times greater than the new recommended federal multiplier of 20 for wetland mitigation through  
23 preservation, and more than 17 times greater than the state preservation ratio of 10:1. The Eversource  
24 Land Trust will hold the conservation easements temporarily. The Project continues working to  
25 identify one or more permanent conservation easement holders. Stewardship fees that will be paid to  
26 the temporary easement holder of seven of the eight parcels, Eversource Land Trust, were calculated  
27 for each preservation site. The total is approximately \$194,000. Site Z1 in Concord, the pine barrens  
28 site, is expected to be owned, held, or managed by a wildlife agency. Draft conservation easement  
29 deeds were revised and submitted to NHDES. NHDES has indicated that the mitigation package  
30 appears to be adequate compensation for Project-related impacts, and has approved the wetlands  
31 permit application which relies in part upon the mitigation plan.

1 Finally, wetland restoration notes, a planting table, and additional construction monitoring  
2 notes were added to the permitting plans and submitted to NHDES on January 25, 2017. These were  
3 also reviewed by the NHNHB, and their comments addressed in the plan revisions. Final native seed  
4 mixes will be provided to NHNHB for approval and submitted to NHDES prior to construction.

5 **Q. Have you reviewed testimony about the Project's potential impacts on wetlands**  
6 **and natural resources from witnesses for Counsel for the Public and intervenors?**

7 A. Yes, we received comments specific to wetlands, water quality and natural resources  
8 from the Counsel for the Public's experts, intervening towns and other public agencies, and from  
9 abutters and non-abutting intervenors and their representatives. There were some material concerns as  
10 well as common themes raised in the testimony we reviewed, primarily related to route selection,  
11 wetland delineation and assessment methods, the extent of wetland impacts beyond the Project area,  
12 the duration and restoration of temporary impacts, vernal pool surveys, survey methods for endangered  
13 and threatened plants and wildlife and impacts to these species, erosion and sedimentation concerns,  
14 and mitigation.

15 I address these issues below by general topic.

16 **Impact avoidance and minimization** - Several intervenors pointed out that any overhead route  
17 was not the least impacting alternative, and therefore only complete burial should be permitted. The  
18 State regulatory requirement associated with wetland impacts is that "the alternative proposed by the  
19 applicant is the one with the least impact to wetlands or surface waters on site" Env-Wt 302.04 (a)(2),  
20 and the federal counterpart is that the applicant must demonstrate that it has chosen the "least  
21 damaging practicable alternative". The intervenors' testimony on selecting the least impacting  
22 alternative completely and erroneously disregards the added requirement that the avoidance measures  
23 be "on site" or "practicable." DES's approval of the wetlands application demonstrates that it found  
24 that Northern Pass has made that demonstration.

25 **Wetland Delineations and Assessments** - The Concord Conservation Commission's expert,  
26 Rick van de Poll, challenged our field wetland delineations, indicating that by reviewing color infra-  
27 red aerial photos, he identified wetlands we missed or delineated improperly. While aerial photos are  
28 valuable for planning purposes, and were consulted by our field scientists, they are not a substitute for  
29 examining soil, hydrology and vegetation in the field as required to delineate wetland boundaries for  
30 permitting purposes. Mr. van de Poll subsequently field checked several locations when vegetation  
31 was dormant and soils were partially frozen and noted several small locations where he believes

1 wetlands were missed, and one location where he believes conditions may support a vernal pool that  
2 was not mapped as such by Normandeau. We reviewed his comments and our wetland maps and  
3 notes, and disagree that his winter observations are cause for concern. Our field delineations were  
4 conducted during the growing season, reviewed during our quality control process, spot-checked by  
5 the USACE, and found in almost all cases to be accurate. Wetland consultants hired by the Towns of  
6 Bethlehem and Northumberland also reviewed our wetland delineations in the field in those towns and  
7 stated in their reports that “wetlands were accurately delineated and documented.” Further, permit  
8 condition 12 in the March 1, 2017 final NHDES decision states that “[p]rior to construction, all  
9 wetland and surface water boundaries adjacent to construction areas shall be clearly marked to prevent  
10 unintentional encroachment on adjacent wetlands and surface waters.”

11 The SPNHF expert, Ray Lobdell, commented that Normandeau misapplied the USACE  
12 highway wetland assessment methodology by identifying high quality wetlands, since the highway  
13 methodology does not recommend numerical rankings. However, we reported the results of the  
14 highway methodology for all wetlands in the Project area in Appendix B of the Wetlands, Rivers,  
15 Streams, and Vernal Pools Assessment and Impact Report (2015) without rankings. Our subsequent  
16 and additional identification of wetlands with the greatest number of functions was a separate analysis,  
17 used primarily for selecting wetlands to describe in the narrative report and for evaluating impact  
18 avoidance trade-offs where necessary. Efforts were made to avoid and minimize all wetland impacts,  
19 regardless of functional capacity. Mr. Lobdell also stated that the wetland functions and values  
20 assessment should have extended to the entire wetlands, not just portions within the ROW. The  
21 highway method requires field visits to the wetland (page 10, USACE Highway Methodology  
22 Workbook Supplement, April 2015). Since trespassing off the ROW was not allowed for delineation  
23 or assessment, we applied the method from within the ROW and incorporated visible portions of the  
24 wetland into the evaluation. Large wetlands clearly extending well beyond the ROW and those  
25 associated with a visible waterbody were noted on data sheets. These factors were considered in the  
26 functions and values assessment, but the primary focus was on the portion of the wetland within the  
27 ROW where the essential biological and physical conditions specified in Appendix A of the method  
28 could be observed. Furthermore, wetland impacts will be confined to the ROW and development sites,  
29 and the impact assessment should accurately identify the quantity and quality of the actual wetland  
30 impacts so that appropriate in-kind compensatory mitigation can be developed.

1           Page 10 of the Town of Bethlehem Conservation Commission testimony of Cheryl Jensen,  
2 which is based in part on a report prepared for them by wetland consultants who are not testifying as  
3 experts, suggested that Northern Pass will have an adverse impact on biodiversity and wetland quality  
4 and function upstream and downstream of the ROW. Most impacts are temporary and will be restored  
5 with native vegetation, including whatever is rooted in the soil, the existing soil seed bank, seed from  
6 the adjacent ROW, as well as native seed mix as needed. Best Management Practices (“BMPs”) to  
7 control the introduction and spread of invasive species are permit requirements and important to  
8 maintaining biodiversity. After restoration, conditions similar to the preconstruction conditions will  
9 become reestablished in this existing ROW, and continue to provide scarce early successional habitat,  
10 which supports biodiversity.

11           **Off-ROW Wetland Impacts** - A common theme among the intervenors is the idea that  
12 because wetlands are hydrologically connected to other wetlands and waterbodies upstream and  
13 downstream of the ROW, our surveys and impact assessments also should have extended beyond the  
14 ROW. While we appreciate the connectivity of wetlands and waterways, we expect that BMPs will  
15 prevent adverse impacts to hydrology, soils and vegetation beyond the ROW. Because permanent  
16 wetland impacts along the ROW are so small, resulting functional changes to an extensive wetland  
17 system would not be measureable.

18           Several intervenors also mentioned that the impact assessment was incomplete since additional  
19 laydown areas or staging areas had not been included. While the application includes those known at  
20 the time of the application, we did recognize that additional laydown sites may be necessary and noted  
21 that locations without jurisdictional or sensitive resources would be prioritized. Please also refer to the  
22 Direct Pre-filed Testimony of John Kayser, at pp. 15-16. In our experience, minor modifications to  
23 impact locations or quantities due to any number of factors may be necessary on large projects. The  
24 NH Wetlands Bureau has a permit amendment protocol for addressing such modifications for this  
25 reason.

26           **Temporary Impacts and Restoration** - Mr. Van de Poll and several other intervenors have  
27 challenged our classification of temporary impacts, stating that some of these impacts are more long-  
28 term or even permanent. We followed the guidance of the NHDES, USEPA and USACE in  
29 calculating permanent, temporary and secondary impacts. Permanent tree removal from forested  
30 wetlands, stream buffers and vernal pool buffers, as well as compression of organic soils, are



1 secondary impacts for which compensatory mitigation has been provided. In addition, mitigation of  
2 temporary impacts is included through restoration, which conforms to State and federal regulations.

3 The SPNHF witness Ray Lobdell suggested that the Project should have provided detailed soil,  
4 vegetation, topography and restoration plans for each of the “over 800 restoration sites”. While the  
5 Project does have soil, vegetation and photo documentation for all wetlands in the project area,  
6 individual restoration plans are unnecessary. Almost all of the temporary wetland impacts are  
7 associated with the placement of timber mats, which, upon removal, typically require only minor  
8 active restoration efforts. The extent of restoration activities necessary at each location will depend in  
9 part on the season and duration of temporary construction mats, and will benefit from the input of the  
10 Environmental Monitors. Grading, where necessary, will blend into the surrounding, un-impacted  
11 wetlands which in almost all cases will be only several feet away. Revegetation will be from the  
12 existing seed bank, supplemented with native seed mix appropriate for New Hampshire wetlands, as  
13 needed. We believe that achievement of success requirements provided in the conditions associated  
14 with the wetland approval will be easily assessed.

15 **Vernal Pool Surveys** - The Counsel for the Public witnesses from Arrowwood questioned  
16 Normandeau’s selection and application of Calhoun and Klemens (2002) vernal pool assessment  
17 method. To the contrary, in my view it was the most relevant and appropriate method available in New  
18 England at the time, it was acceptable to the State and federal wetland regulators, who did not specify  
19 any particular method, and we appropriately modified the results based on our field observations as  
20 warranted (Wetlands, Rivers, Stream and Vernal Pools Resource Report and Impact Analysis, 2015,  
21 pp. 2-8. App. Ex. 1. Appendix 31). Arrowwood also pointed out that there are locations where further  
22 vernal pool impact avoidance and minimization could occur. Two of these locations have already  
23 been avoided through work pad and access road relocations, which were submitted and approved by  
24 NHDES, and we expect that the environmental monitors will help identify additional minor timber mat  
25 adjustments during construction that further reduce impacts. The experts also indicated that we failed  
26 to identify secondary impacts for vernal pool buffers, but these were quantified in accordance with the  
27 methods requested by the federal authorities. A consultant hired by several municipalities also  
28 suggested that three or four years of vernal pool monitoring would provide more information for  
29 assessing impacts. Northern Pass complied with NH Wetlands Bureau and USACE requirements for  
30 vernal pool surveys. NHDES approved the wetland permit application, which included vernal pool  
31 identification and impact assessment details.

**Threatened and Endangered Species Surveys** - Mr. Van de Poll and the Arrowwood

witnesses suggested that the searches for endangered and threatened species were inadequate either because our methods relied on desktop work and existing information to focus the surveys on appropriate habitats, or because we did not search for, record, and evaluate impacts for all possible species of plant and animal life. Our protocols for Threatened and Endangered species searches were appropriate for the scale of the Project and were approved by the USFWS, NHF&G, and NHNHB. No significant issues with the endangered mussel surveys were mentioned. Other Normandeau experts address this comment relative to plants and wildlife in their testimony.

**Erosion and Sedimentation** – Several intervenors testified that erosion and sedimentation will be a significant impact on wetlands and water quality. The Applicants have identified appropriate BMPs for limiting the risk of erosion and sedimentation, and must provide water quality monitoring during construction activities, consistent with Project permit conditions. The methods proposed have been developed by experts in the construction and regulatory community, comply with State and federal requirements, and are standard practices commonly used on construction projects of all kinds around the state, including other transmission projects. Furthermore, as with any other construction project, there are regulatory consequences for failing to comply with these requirements or violating water quality standards. The testimony of Mr. Jake Tinus also addresses this issue.

The Pemigewasset River Local Advisory Committee (“PRLAC”) also commented that the existing ROW crossings of the Pemigewasset River have erosion problems. While not directly related to Northern Pass, Eversource conducted an inspection of these five crossings in 2016 and prepared a report, included on the Applicants’ Track 2 Exhibit List. According to this report, soils at most crossing locations consist of sandy alluvium that is naturally prone to erosion. No serious erosion-related water quality issues were observed at the time of the assessments and some of the riverbanks at the ROW crossing showed no erosion issues at all. I have also observed these locations in the field, concur with the findings of the report, and support the recommendations in the report to minimize equipment access on steep slopes and top of bank, allow woody growth where practicable, and employ erosion controls appropriately where needed.

**Mitigation** – Finally, several intervenors have mentioned that they believe the natural resource mitigation plan does not adequately provide compensatory mitigation for wetlands impacts within their municipalities, and some also questioned the sufficiency of mitigation for Karner blue butterflies. The Applicants have consulted regularly with the State and federal agencies during development of the

1 mitigation plan, and reached out to those towns with the greatest impacts for mitigation ideas.  
2 Ultimately, the wetland compensatory mitigation plan must offset the loss of wetland type and function  
3 associated with the Project, within the watersheds in which the Project is located. Watersheds are  
4 more relevant than political boundaries for mitigating impacts, since many wetland functions are  
5 related to water flow. In addition, most of the mitigation is for secondary impacts along the new ROW  
6 associated with tree clearing in wetlands, vernal pool buffers, and stream buffers. Preservation of land  
7 within the same watersheds as the clearing is an ecologically appropriate method for mitigating  
8 impacts to these resources and to wildlife habitat. The combination of land preservation and ARM fund  
9 payments was the best method for addressing the range of wetland functional impacts and wildlife  
10 habitat impacts related to the Project.

11 The Applicants have been able to purchase a property adjacent to the existing Karner blue  
12 butterfly refuge in Concord, which will be managed for Karner blue butterflies, and is acceptable to  
13 both the NHF&G and USFWS as compensation for construction impacts. In addition, a pine barrens  
14 ROW management plan was developed with input from NHF&G, USFWS, and NHNHB to protect  
15 pine barrens habitat post construction within and beyond the ROW. This was submitted as part of the  
16 Final Mitigation Plan submitted to DES on Dec 14. App. Ex. 72.

17 **Q. Please describe the Applicants' consultations with State and federal resource**  
18 **agencies since October 2015.**

19 A. The Applicants have continued to meet with the NHDES to discuss the wetlands, AOT  
20 and 401 Water Quality Certificate application materials and answer questions. We provided additional  
21 data in several packages from July 2016 through January 2017, and also accompanied the mitigation  
22 specialist and USACE assistant project manager on a site walk of the mitigation sites. We also met  
23 with and provided additional information to the NHNHB and the NHF&G to address questions and  
24 concerns about wildlife, ROW management, and plant protection. We also have discussed the Project  
25 with the USFWS, USACE and USEPA. Copies of correspondence and meeting notes are provided in  
26 an update to Appendix 48 on the Applicant's Track 2 Exhibit List. On March 1, 2017, the NHDES  
27 provided a final decision to the Site Evaluation Committee recommending approval of the Wetland,  
28 Shoreland, Alteration of Terrain and 401 Water Quality applications with conditions. App. Ex. 75.

29 We continue to work with the NHNHB for approval of proposed restoration seed mixes and  
30 with NHFG to finalize wildlife impact avoidance and minimization measures. The Applicants will  
31 continue consultations with relevant natural resource agencies throughout the rest of the permitting,

1 construction and post-construction phases of the Project, as outlined in the permit conditions issued by  
2 NHDES.

3 **Q. Are there any other relevant updates to your Direct Pre-Filed Testimony from**  
4 **October 16, 2015?**

5 A. Yes, I would like to make one correction regarding fisheries habitat. On page 11, lines  
6 15-17 of my pre-filed testimony I stated that “[t]he estimated increase in maximum July stream  
7 temperature resulting from vegetation clearing was significant for five of the streams within Section  
8 N1, where there is currently no maintained ROW.” The reference to five streams was an error; the  
9 correct number is four.

10 **Q. Has your opinion regarding whether this Project has a substantial negative impact**  
11 **on wetland resources or an unreasonable adverse effect on the natural environment changed?**  
12 **Please explain.**

13 A. No, my opinion has not changed. I believe this Project will not have a substantial  
14 negative impact on wetland resources or an unreasonable adverse effect on the natural environment.  
15 My opinion is based in part on the testimony of Dr. Sarah Barnum and Dennis Magee, and the work  
16 Normandeau has conducted since the application materials were submitted in October 2015. This new  
17 work includes refinements to the Project design which have reduced impacts to wetlands, vernal pools,  
18 and threatened plants. Northern Pass also has acquired a parcel for Karner blue butterfly conservation,  
19 developed a pine barrens ROW management plan with agency input, and refined wetland restoration  
20 details and wildlife impact avoidance and minimization measures.

21 **Q. Has your opinion regarding whether this Project will have an unreasonable**  
22 **adverse effect on water quality changed? Please explain.**

23 A. No, my opinion has not changed. I believe the Project will have not an unreasonable  
24 adverse effect on water quality. The engineers collected and submitted additional field data to further  
25 design the development site stormwater plans. The NHDES wetland, shoreland, AOT and 401  
26 applications have been approved, and the Project has committed to the permit compliance and  
27 monitoring requirements provided by the regulatory agencies. I am relying in part on the testimony of  
28 Jake Tinus, which provides additional details about water quality protection.

29 **Q. Does this conclude your supplemental pre-filed testimony?**

30 A. Yes, it does.