



Bethlehem Conservation Commission
Bethlehem, NH 03574

January 29, 2016

Pamela Monroe, Administrator
New Hampshire Site Evaluation Committee
21 South Fruit Street, Suite 10
Concord, New Hampshire 03301
pamela.monroe@sec.nh.gov

RE: New Hampshire Site Evaluation Committee Docket No. 2015-06
Northern Pass Transmission Project - Eversource

Dear Ms. Monroe:

The Bethlehem Conservation Commission is submitting this letter to request intervenor status in the Northern Pass Transmission Project.

In approving this project, according to RSA 162-H: 16, the Site Evaluation Committee must consider that the project "will not have an unreasonable adverse impact on the aesthetics, historic sites, air and water quality; the natural environment and public health and safety.

According to RSA: 36-A, municipalities may establish conservation commissions "for the proper utilization and protection of the natural resources and for the protection of watershed resources of said city or town." The Bethlehem Conservation Commission argues that this project could have an "unreasonable adverse impact" on the natural resources and watershed resources of our town.

This view is based on findings from a report we commissioned in November 2015, which was conducted by two certified wetlands scientists. The report, "Assessment of the Transmission Line Proposal on Natural Resources within the northern half of Bethlehem, New Hampshire," is attached to this e-mail request.

In Bethlehem, this project will include 4.9 miles of overhead transmission lines, which will transition into 3.1 miles of underground transmission lines along public roads at Transition Station #5 on U.S. Route 302.

The environment will be impacted by the overhead transmission lines, which will be constructed through wetlands in and adjacent to the ROW. It will also be impacted by the construction of Transition Station #5 across from Miller/Baker Brook Pond.

Adverse effects of this project are likely to impact the Ammonoosuc River, as well as aquifers, wildlife and wildlife corridors in Bethlehem.

At notable risk is the Wood Turtle. *Glyptemys insculpta*, the Wood Turtle, is a native turtle which has been designated as a Species of Greatest Conservation Need in New Hampshire as of the 2015 Wildlife Action Plan. (See New Hampshire's Wildlife Action Plan, Chapter 2, New Hampshire Wildlife and Habitats at Risk, Table 2-1, page 5:

<http://www.wildlife.state.nh.us/wildlife/documents/wap/chapter2-specieshabitatsatrisk.pdf>)

And the Natural Heritage Bureau has documented its presence in the Miller/Baker Brook Pond area within a half mile of the protected shoreland buffer of the pond, which will be impacted by the construction of Transition Station #5, according to the Shoreland Permit Application submitted to the New Hampshire Department of Environmental Services. (See attached page 10, Section 3.1, from Normandeau Associates Shoreland Permit Application for Miller/Baker Brook Pond.)

The impact on wetlands in Bethlehem is particularly significant. Northern Pass Project consultants delineated approximately 90 acres of wetlands in all of Bethlehem, Whitefield and Dalton. This represents 29.9 percent of the total land area surveyed. That means nearly one-third of the total ROW within three towns contains wetlands. And of the three towns mapped, 55 of the 110 wetlands are in Bethlehem.

Just within their limited scope of the existing ROW, the Northern Pass Project consultants identified 55 wetlands in Bethlehem, including 4 of "high quality"; 7 rivers and perennial streams, 3 intermittent streams, 1 ephemeral stream and 5 vernal pools, 2 of which were deemed of "high quality," which would be impacted by the Project as proposed.

(See p. 4 of attached "Assessment of Transmission Line Proposal on Natural Resources within the northern half of Bethlehem, New Hampshire" and the Applicant's Wetland Permit Application Appendix 31: http://www.nhsec.nh.gov/projects/2015-06/application/Volume-VII/2015-06_2015-10-19_nptllc_psnh_app_5_bethlehem_millerpond.pdf)

The impact on the Ammonoosuc River could be extensive. We have notified New Hampshire's Department of Environmental Services of five specific areas of concern that we have with this project based on the findings of our certified wetlands scientists. Each of those involves potential adverse impacts to the Ammonoosuc River. The Ammonoosuc River is a Designated River protected within the New Hampshire Rivers Management and Protection Program under RSA 483.

An unnamed perennial stream flows directly into the Ammonoosuc; Barrett Brook flows into the Ammonoosuc as does Black Brook. Another unnamed perennial stream flows into Baker Brook, which then flows into the Ammonoosuc. And nearly 79 acres of aquifers are associated with this perennial stream. There could be an impact from construction on aquifers in Bethlehem. Nearly 11 percent of the Town of Bethlehem is underlain with Stratified-drift aquifers and the majority of those lie along the Ammonoosuc River. (See pages 5 and 6 of our attached report "Assessment of Transmission Line Proposal.....")

The Ammonoosuc River Local Advisory Committee opposes this project because of the negative impact on the river aesthetically, environmentally, and economically for all the reasons expressed in its letter of 11-January-2016 to the SEC, which is attached.

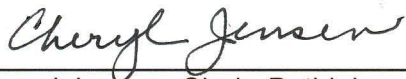
The significance of Miller/Baker Brook Pond. Construction of Transition Station #5 is planned to take place directly across from Miller/Baker Brook Pond, which is the largest open water pond in the Town of Bethlehem at 17.9 acres. Being over 10 acres, it is classified as public water subject to the Comprehensive Shoreland Protection Program for lakes and ponds. It is an important habitat for big mammals such as moose, beaver, weasel, mink, spotted salamander, leopard frogs, toads, **Wood Turtles** and others.

The environmental impact of this project is being underestimated. We also have concerns over the possibility that this application is really not complete because **all** temporary impacts are not accounted for, and, therefore, impacts to the environment are potentially being underestimated. None of the applications being submitted to the New Hampshire Department of Environmental Services --

such as Wetlands Permit Applications and Alteration of Terrain Permit Applications – seem to include impacts caused by laydown areas, staging areas and temporary access roads, all of which will be required during the construction phase of this project. (See attached letter from Peter Roth, Counsel for the Public, page 5)

Given all the above potential adverse effects of this project on the watershed and the natural environment, we believe we have demonstrated that our rights, duties, privileges, immunities or other substantial interests might be affected by the proceedings, per New Hampshire Code of Administrative Rules, Site 202.11 regarding intervention.

Sincerely,



Cheryl Jensen, Chair, Bethlehem Conservation Commission
P.O. Box 189
Bethlehem, New Hampshire 03574
cherylkjensen@aol.com

Attachments:

- 1) "Assessment of Transmission Line Proposal on Natural Resources within the northern half of Bethlehem, New Hampshire, December 15, 2015"
- 2) Section 3.1, p.10: Normandeau Associates Shoreland Permit Application for Miller/Baker Brook Pond
- 3) Letter of 11-January-2016 from the Ammonoosuc River Local Advisory Committee to the SEC
- 4) Letter of December 2, 2015 from Peter Roth, Counsel for the Public to the SEC

Cc: To all the people on the SEC distribution list as of January 29, 2016. Copies of this request have been sent via e-mail to the SEC committee membership as posted on your website.



To: Pamela G. Monroe, Administrator
New Hampshire Site Evaluation Committee
21 South Fruit Street, Suite 10
Concord, NH 03301
pamela.monroe@sec.nh.gov

Date: 11-January-2016

**Re: NH Site Evaluation Committee Docket No. 2015-06
Northern Pass Transmission and Public Service Company of NH d/b/a Eversource Energy**

**NHDES File #2015-02829 Northern Pass Shoreland Permit Application for the HV/DC
transmission line crossing of the Ammonoosuc River along Route 116 in Bethlehem, NH**

Dear Ms. Monroe:

The Ammonoosuc River Local Advisory Committee (ARLAC) opposes this project. We believe this project, as it is proposed, would have a negative impact on the Ammonoosuc River aesthetically, environmentally, and economically. As a result of the committee's opposition, we offer the following for your consideration:

The Ammonoosuc River is a Designated River protected within the NH River Management and Protection Program, under RSA 483. The river is unique in the precipitous drop from its headwaters at Lakes of the Clouds in the alpine zone within the Mt. Washington summit region at 5,018 feet in elevation, descending through the White Mountain National Forest to an altitude of 1,640 feet at the Crawford Purchase, in the Town of Carroll, nearly a 10% drop over approximately 7 miles of river flow (Ref. Ammonoosuc Watershed Region Conservation Plan, 2005).

The river supports diverse habitats critical for aquatic and terrestrial life along its course downstream to the confluence with the Connecticut River. The Bethlehem stretch of the river, classified as "rural river," belongs to the public trust and is possibly the most natural section of mountain stream within the State of NH, essential to the wild trout we are so fortunate to have.

Management of rural rivers carries the stipulation "to maintain and enhance the natural, scenic and recreational values for which the river or segment was designated." The river is managed for brook trout, the only species of trout native to the region, and is stocked annually with rainbow, brook, and brown trout. NH Fish & Game has determined the river is suitable for self-sustaining wild populations of brook trout due to its cool water temperature, natural shading and geological sub straight. There is a "bouldery reach" along the Wing Road area in Bethlehem that offers pockets of shallow riffles and ripples necessary for healthy brook trout propagation.

The riparian zone stability is essential to the health of this crucial river resource for landowners, wildlife, recreation, agriculture and a host of additional uses. (RSA 483)

The section of the river, where the proposed project intends to cross, is fragile and extremely susceptible to erosion into the river due to the sandy glacial till that exists. The LAC feels any disturbance would result in a detrimental effect upon this pristine waterway.

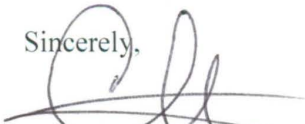
LAC is concerned about the cumulative impact of the project. The project proposes to cut vegetation, including trees higher than 20 ft by the ROW as well as clearing 5,059 sf of upland trees on the east side of the river. The tree canopy provides essential shade that moderates in-stream temperatures for trout habitat. The tree roots stabilize the shore land and provide vital cover for natural fish populations and should be left intact. Damaged wetlands lose their capacity to store runoff water and filter sediment. Shore land disturbances that degrade the immediate area with erosion and siltation affect the river downstream.

Based on soil condition, the proposed 4-concrete tower bases may be required to be cast at excessive inverted depths. This construction method would only add to the detrimental effect upon the rivers riparian area, which the LAC feels is unacceptable.

Maintenance of the proposed project we assume would require yearly vegetation control, which we feel would only offer continued herbicide and erosional damage to the immediate area as well as down stream contamination.

When an application is received, LAC looks for a Stormwater Management Plan, required in NH for a construction project that will disturb one or more acres of land. It was not found within the voluminous document received; if available, please advise where it is located within the document. The application did not provide a post construction maintenance plan. We will provide further comment as additional information becomes available.

Sincerely,

A handwritten signature in black ink, appearing to read 'CHodge', with a large circular flourish at the beginning and a horizontal line extending to the right.

Christopher Hodge, Vice Chairman
Ammonoosuc River Local Advisory Committee

Cc: Darlene Forst, NHDES Shoreland Supervisor

**ATTORNEY GENERAL
DEPARTMENT OF JUSTICE**

33 CAPITOL STREET
CONCORD, NEW HAMPSHIRE 03301-6397

JOSEPH A. FOSTER
ATTORNEY GENERAL



ANN M. RICE
DEPUTY ATTORNEY GENERAL

December 2, 2015

Pamela Monroe, Administrator
New Hampshire Site Evaluation Committee
21 South Fruit Street, Suite 10
Concord, New Hampshire 03301

Re: Joint 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 – SEC Docket Number 2015-06.

Dear Ms. Monroe,

I write at this time to advise the Committee on a number of important issues that we observed in the recently filed Joint 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 (the “Application”). Counsel for the Public does not take a position on completeness, as this is an issue for consideration by the Committee without an adjudicative proceeding over the issue. We offer these comments and perspectives, with the public interest in mind, as an aid to the Committee as it makes that determination.

On October 19, 2015, Northern Pass Transmission LLC (“NPT”) and Public Service Company of New Hampshire d/b/a Eversource Energy (“PSNH”, and together as the “Applicants”) filed the Application with the Committee to construct the Northern Pass Transmission Project (the “Project”). The Project is a 192-mile high voltage transmission project that includes a 320 kV direct current (“DC”) transmission line, over sixty miles of which is to be built under public roadways, a 345 kV alternative current (“AC”) transmission line, a converter station in Franklin, NH, other associated equipment and the relocation of existing electric transmission and distribution lines. The Project is of unprecedented scope for New Hampshire and will have a lasting impact on its citizens and resources. There are dozens of communities in the state that will be impacted directly or indirectly by the construction, operation or maintenance of the Project. Because of this, the Committee’s task in reviewing the Project under limited timeframes will require complete and detailed information on the benefits and impacts of the Project.

A filing of this magnitude requires that the Applicants provide a certain threshold of evidence that would allow the Committee to proceed to the adjudicative proceeding from which the Committee can make the required statutory findings on benefits and impacts of the Project. This is sometimes called a *prima facie* case. In order to assure the Project meets the statutory standards and that Counsel for the Public and other busy state and federal agencies, landowners and advocacy groups are using time and resources as efficiently as possible, Counsel for the Public provides these comments and perspectives on whether the Applicants have met their *prima facie* burden.

Project Benefits

The Application and pre-filed testimony describe generalized benefits of the Project, both for New Hampshire and the broader region. The claimed benefits include lowering the cost of energy, providing low carbon, renewable power, creating jobs, increasing tax revenue and generally growing economic activity. The testimony provided publicly, however, gives little detail on how the cited benefits were calculated. The Applicants did submit the Pre-Filed Testimony of Julia Frayer and a report entitled *Cost-Benefit and Local Economic Impact Analysis of the Proposed Northern Pass Transmission Project* (Appendix 43 to the Application). The testimony and report were submitted to the Committee under seal with a Motion for Protective Order and Confidential Treatment. Neither the testimony nor the report is available to the public, or more specifically to the Counsel for the Public, to allow us to determine whether they contain sufficient information for the Counsel for the Public to exercise our statutory responsibilities or for the Committee to adequately evaluate the Project and its benefits and impacts. Moreover, as Counsel for the Public has not had an opportunity to review the testimony or the report, we cannot determine whether the information that is included within is accurate and withstands analytical scrutiny; although, understandably, this may be an issue for the adjudicative proceeding.

Counsel for the Public is charged with representing the public “in seeking to protect the quality of the environment and seeking to assure an adequate supply of energy.” R.S.A. 162-H:9, I. We cannot perform this task without (a) understanding the claimed benefits and (b) independently determining that the claimed benefits are likely to be realized. For example, the Project as designed will have long-term impacts on the aesthetics of some of New Hampshire’s most scenic areas. In order to determine whether the tradeoff between those impacts and the public benefits are acceptable, Counsel for the Public and the Committee must thoroughly understand those benefits. Additionally, to determine if the Project’s ability to deliver power from Quebec is “adequate” for the public, Counsel for the Public and the Committee need to be able to determine if the promised benefits are consistent with New Hampshire’s long-term energy goals. Without access to this key piece of testimony and the accompanying report, Counsel for the Public cannot say whether the Application contains the required threshold of information to satisfy the statutory criteria.

Decreased Energy Costs

Applicants repeatedly claim that both New Hampshire and the New England region will see a decrease in energy costs as a result of the Project. The publicly available version of the Application does not explain how the Applicants have calculated the stated benefits. The Project (and presumably the costs cited in the Application) contains only transmission assets. It does not, at least in the publicly available version, include generation components or an agreement to purchase power. If the savings are based on a pre-negotiated purchase power agreement ("PPA"), there is no explanation of any of the terms or conditions of that agreement. The Application materials do not even indicate whether such a PPA was provided with the non-public materials. The Applicants repeat that New Hampshire customers will pay no costs associated with the Project, but fail to explain if there are any delivery costs associated with the sale and purchase of the power that will flow over the lines. Without this information, Counsel for the Public cannot determine what type of power will be transmitted over the Project or how that power will result in reductions of power costs. The Committee should require the Applicants to provide the withheld testimony and report to Counsel for the Public and allow adequate time for us to review the testimony to determine whether it makes a *prima facie* case for the benefit of decreased energy costs.

Environmental Attributes

Additionally, the Applicants state that the power to be transmitted across New Hampshire is low-carbon emitting and renewable. The Application does not state, however, if there is an agreement on transferring the environmental attributes of the power, which would be required if any purchaser wanted to claim the environmental benefits of the power. The testimony provided does not demonstrate how NPT would guaranty that hydroelectric power would be used to supply power over the Project transmission lines or whether hydroelectric power from Hydro Quebec is considered "renewable" in any of the New England states. These are primary benefits of the Project that Applicants cite for which there is little information on how those benefits are calculated or whether they are based on sound assumptions. The Committee should require the Applicants to provide the Frayer testimony and report to Counsel for the Public and provide us with adequate time to review the testimony to determine whether it makes a *prima facie* case on the claimed benefit of the environmental attributes.¹

¹ Assuming that the Applicants can demonstrate there is a long-term commitment to have Canadian hydroelectric power flow across the lines, they have provided no discussion of the impacts of the hydroelectric development within Quebec. If Applicants feel it is appropriate for the Committee to consider regionalized benefits of the Project outside of New Hampshire, they do not likewise explain why impacts outside of New Hampshire should not be considered as well. These impacts could include the impacts of expanding the transmission grid in Quebec and the impacts of large hydroelectric projects in environmentally and culturally sensitive areas.

Alternatives

The central need for the Project is not well defined in the Application or the supporting documents. Notwithstanding this, other than alternative routes for the Project transmission lines, Counsel for the Public cannot determine if the Applicants considered any alternatives to address that need. These alternatives could be transmission-based, non-transmission based, or some combination of the two. For instance, the Application does not address whether there are other transmission components that could reduce or eliminate one or more components of the Project that would reduce the physical impacts of the Project on New Hampshire resources. Also, the Application does not address whether there are non-transmission alternatives (e.g., demand-side management, distributed generation) that could be implemented in New Hampshire or elsewhere in New England that would have reduced the impacts of the Project. As both of the Applicants are subsidiaries of a company that owns electric utility assets in Massachusetts and Connecticut, the parent company is in a good position to design and implement non-transmission alternatives that may decrease the need to build the Project as proposed. Regardless of the answers to these questions, there does not appear to be any discussion of a Project alternatives analysis.

Constructability

The Project as proposed by the Applicants is a complex linear development that will take years to construct. The Applicants have proposed to build portions of the transmission line in new cleared corridors, underground along rural public roads in high-elevation terrain, and in existing corridors that currently contain up to four transmission and distribution lines. Given this complexity, and the impact that construction will have on those that live near the sites of the proposed Project, there is insufficient information on the specific impacts of the Project's construction on the communities that will host the Project.

Underground Construction

The Applicants have provided detailed information on policies and procedures for how *generally* to build and operate a transmission line and the associated infrastructure. What the Application does not do, and what is critically important at this stage of the review process in order to determine whether the impacts are reasonable, is describe how construction will be performed and how it will impact specific areas where the Project is proposed. This is most obvious for the underground portions of the Project. For example, it is impossible to tell whether the Applicants have specifically analyzed how construction of the route between Bethlehem and Bridgewater will impact the hosting communities. Are there adequate alternative roads to accommodate traffic during construction? How will emergency services be impacted (e.g., will routes to hospitals be unavailable)? When will construction occur in certain locations? How specifically would road limitations be dealt with in bad weather?

The pre-filed testimony of Ms. Farrington indicates that certain sections of road could be closed for one to two weeks. This underground section will go through numerous downtown areas in the White Mountains region, one of the main tourist areas in New Hampshire. How long will construction be in those downtown areas and how will it impact business and other daily life? Will it deter tourists from visiting these communities? The Application lacks community specific information on the impact of building and maintaining this underground section. This is not something that should wait for post-Certificate design and approval as the communities involved deserve to weigh in on the impacts and the Committee needs to understand the full impact of the Project that it is approving.

Overhead Construction

In addition to the lack of information on constructing the underground sections of the Project, the Application lacks sufficient information to determine a *prima facie* case of feasibility of the overhead construction in locations where it is to be co-located with other transmission and distributions lines in an existing corridor. In order to locate the new line in the existing corridor, the existing lines need to be relocated and the support structures changed. The Application does not, however, provide information or analysis regarding any potential impacts to the reliability of the new or existing lines from placing them all within one right-of-way. Moreover, as the construction will cause outages to the customers that are served by the existing lines in those corridors, there is no specific description of how those outages will impact the customers. If the consequence of placing the Project transmission line in an existing corridor is a plan to relocate an existing transmission or distribution line (that is not under the jurisdiction of the Committee) to a new corridor, that plan has not been adequately explained.

Laydown and Staging Areas and Access Roads

Construction of the Project will require the use of laydown areas, staging areas and temporary access roads. The pre-filed testimony of Mr. Kayser indicates that laydown areas can be up to fifty acres. It also may require extending existing access roads in order to accommodate construction vehicles and delivery of construction materials, particularly at overhead/underground transition stations. Pre-filed Direct Testimony of John Kayser at 15. Yet the testimony does not describe how many laydown areas are needed or where they will be located. The pre-filed testimony of Mr. Kayser states that the information is not known at this time. *Id.* at 15-16. Thus, for an unknown portion of the land that will be impacted by construction, which could be significant given the potential size of each laydown site, the Application is silent. There is no discussion of the impact on wetlands, rare or endangered species, storm water or any other natural resources. To leave the review and identification of this information for post-Certificate review will result in the total impact of the Project being underestimated. The Committee should require the Applicants to provide more specific information on the number of laydown and staging areas, where they will be located and if they will have an unreasonable adverse impact on any affected natural resources.

Description of Project Infrastructure

The Application does not provide a written description or illustrated depiction of many of the major Project structures, including the overhead/underground transition stations, the components of the converter station and the substation expansions. This is inconsistent with past applications to the Committee and the information required to be provided with this Application related to transmission line structures by Site 301.03(h)(1). There is no way for Counsel for the Public to determine the size or design of the structures, how they will appear to the public or the area that they will occupy. As a result, Counsel for the Public would not be able to determine the Project's impacts on aesthetics and other resources. The Committee should require the Applicants to submit written descriptions and conceptual drawings of all major components of the Project.

Location of Residences and Other Structures

Pursuant to NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES Site 301.03(c)(3), the Application must provide "The location of residences, industrial buildings and improvements within or adjacent to the site." Although the Applicants have provided a location of such structures by indicating their presence on Project maps, the Application does not appear to provide a list of abutters that is cross-referenced to these maps. As the Committee stated in the *Atlantic Wind* order, "This is necessary for the Committee to understand the effects of the project on the development of the region and the environmental, health and safety impacts of the project and *adequately inform the public regarding the potential impacts of the Facility.*" *Application of Atlantic Wind*, Order Determining Application to be Incomplete at 13 (Jan. 13, 2014) (emphasis added). This is extremely important for Counsel for the Public as we need to be able to discuss specific project impacts with members of the public that are affected by the Project. The Committee should require the Applicants to submit a list of abutting structures, including names and contact information, that is cross-referenced to maps that show the locations of those structures.

ISO-NE System Stability and Reliability Report

The Applicants have included a report from ISO-NE that analyzes an earlier version of the Project's impact on the stability and reliability of the ISO-NE system. This report does not analyze the version of the Project that was actually filed with the Committee on October 19, 2015. As admitted in the pre-filed testimony of Mr. Bradstreet and Mr. Bentley, the Applicants cannot identify every component of the Project that is necessary for system stability and reliability until after ISO-NE has completed reviewing the proposed design and issued a report approving the design and identifying necessary upgrades. Pre-Filed Direct Testimony of Derrick Bradstreet at 12; Pre-Filed Direct Testimony of Bradley P. Bentley at 2-3. This uncertainty as to which components of the Project need to be built in order to assure stability and reliability could cause delays in the adjudicatory process. *Application of*

Atlantic Wind, Order Determining Application to be Incomplete at 11 (Jan. 13, 2014) (“Late filed reports and studies frustrate the discovery process, cause delays and undermine the orderly process of the proceeding and ultimately, the purpose of the statute.”). To the degree the Applicants have included components that are not ultimately required by ISO-NE, that will cause a waste of administrative resources in the review of unnecessary impacts to New Hampshire’s resources.

Impact to Historical Resources

On November 30, 2015, the New Hampshire Division for Historical Resources (“DHR”) filed a letter with the Committee stating that it did not consider the Application to be complete because (a) Phase 1A surveys have not been conducted for approximately 100 properties where Applicants have been denied access; (b) Phase 1B surveys have not been conducted on approximately 100 archeological sensitive areas identified in the Section 106 review; (c) study methodologies and results for above-ground historical properties are incomplete and inconsistent with state and federal guidance, and (d) the stakeholder parties have not entered into a Programmatic Agreement to address these unresolved areas. Without the information cited by DHR as necessary for its review and determination of the Project impacts, the Committee, the participating agencies and the parties will not be able to conduct the required analyses.

We hope that this information is helpful to you and the members of the Committee as you review the Application. Thank you for your kind courtesies and consideration.

Sincerely yours,

COUNSEL FOR THE PUBLIC

A handwritten signature in blue ink, appearing to read "Peter C.L. Roth", with a stylized flourish at the end.

Peter C.L. Roth
Senior Assistant Attorney General

cc: Service List

**Assessment of Transmission Line Proposal
on
Natural Resources within the northern half of
Bethlehem, New Hampshire**

December 2015



**Summary Report Prepared by:
Elise J. Lawson (#233) and John C. Severance (#240)
Certified Wetland Scientists
507 West Darling Hill Road
West Burke, VT 05871**

INTRODUCTION

The Town of Bethlehem, New Hampshire is located in the heart of the White Mountains. The Town contains nearly 91 square miles (58,206 acres) of land and 0.1 square miles of inland water area. Bethlehem is roughly bisected into two areas: over 52% is within the White Mountain National Forest (WMNF), comprising the eastern section of Town; and private landowners and homes located in the western section. The Ammonoosuc River is the largest river flowing through Bethlehem. The Gale and Zealand Rivers also flow through Town within the WMNF. Bethlehem contains a wide range of ecological habitats ranging from lowland wetland complexes to higher elevation subalpine zones in the White Mountains. North Twin Mountain is the highest point in Bethlehem at 4,761 feet above sea level.

Northern Pass, LLC submitted a proposal, along with several required permit applications, to construct a transmission line throughout New Hampshire. The proposed route running through Bethlehem is in two parts: the northern part of the line will be above ground along the existing Right-of-Way (ROW) transmission lines; the remaining sections are proposed to run underground along Routes 302 and 18 road ROWs. The potential effects of the transmission line throughout the State including Bethlehem are extensive and include environmental, cultural, scenic and economic impacts.

In November 2015, the Bethlehem Conservation Commission contacted Elise Lawson and John Severance to assist them in reviewing the permits to assess impacts on wetlands and wildlife. Both Elise (CWS #233) and John (CWS #240) have extensive experience with resource-based projects in northern New Hampshire, and have completed several natural resource projects in Bethlehem including a detailed natural resource inventory, a stewardship plan for the Town Forest, vernal pool inventories, wildlife habitat work for private landowners, and several private wetland impact applications filed with the NH DES Wetlands Bureau. Elise and John conducted field work (November 24, 2015) walking the transmission line ROW where the applicants propose to construct above-ground transmission lines. They assessed potential impacts and compared that with work completed to date by consultants hired by Northern Pass.

The time in the field combined with previous studies and GIS mapping resulted in this summary, which addresses a few natural resource concerns.

METHODS

On November 24, Elise and John walked 4.8 miles along the existing ROW in Bethlehem. Although Elise and John did not delineate wetlands at this time, each wetland was documented using a GPS receiver, and then downloaded into the Town's existing GIS database. Existing data used for this report include the following:

1. Maps and studies completed by Northern Pass in submitted applications
2. Existing natural resource data generated during the 2005/2006 natural resource inventory work

3. Existing maps including:
 - a. USGS topographic
 - b. Aerial photos
 - c. US Fish and Wildlife National Wetland Inventory data
 - d. US Natural Resource Conservation Service soils map: poorly and very poorly drained soils
 - e. Aquifer data downloaded from the UNH GRANIT mapping database

Given the time of year for field work, each wetland documented by John and Elise was not given a functional assessment. In addition vernal pools were not documented. Ideally, work would be completed during the growing season when vernal pools are active (May-June), to allow for a more comprehensive evaluation of the area. Nevertheless, results of field work generated concerns of the proposed project. Although the concerns are focused within the Town of Bethlehem, they should be recognized for the entire proposed area from Pittsburg to Deerfield, New Hampshire.

RESULTS

Impacts on Natural Resources

Wetlands and Perennial Streams

Wetlands are an essential habitat type for the majority of plant and animal species in New Hampshire. As a whole, wetlands are extremely diverse depending on the hydrology, soils, topography, and climate of an area. In addition to rivers, lakes, and ponds, there are four general types of Palustrine¹ wetlands: marsh, swamp, bog, and fen, with additional sub-types within each of these categories. This diversity extends into each individual wetland where a complex matrix of plant and wildlife species and water regimes co-exist. The resulting edge habitats within and around wetlands are frequently used by a great deal of wildlife species. It is estimated that riparian areas (habitat along streams and rivers) and wetlands are used by over 90% of the region's wildlife species and provide preferred habitat for over 40% of local species.

In 2015, the U.S. Environmental Protection Agency's (USEPA) Office of Research and Development has finalized a report called: *Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence*.² The report reviews more than 1,200 peer-reviewed publications and summarizes current scientific understanding about the connectivity and mechanisms by which streams and wetlands, singly or together,

¹ Palustrine wetlands are a group of vegetated wetlands traditionally called marshes, swamps, bogs, fens. They also include the small, shallow, permanent or intermittent water bodies often called ponds.

² U.S. EPA. Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-14/475F, 2015.

affect the physical, chemical, and biological integrity of downstream waters. The report focusses on how surface and shallow subsurface connections including small or temporary streams, wetlands, and open waters affect larger waters such as rivers, lakes, reservoirs, and estuaries. It makes five major conclusions, summarized below.

1. Streams, regardless of their size or frequency of flow, are connected to downstream waters and strongly influence their function.
2. Wetlands and open waters in riparian areas (transitional areas between terrestrial and aquatic ecosystems) and floodplains are physically, chemically, and biologically integrated with rivers via functions that improve downstream water quality. These systems act as buffers to protect downstream waters from pollution and are essential components of river food webs.
3. Many wetlands and open waters located outside of riparian areas and floodplains, even when lacking surface water connections, provide physical, chemical, and biological functions that could affect the integrity of downstream waters.
4. Variations in the degree of connectivity are determined by the physical, chemical and biological environment, and by human activities. These variations support a range of stream and wetland functions that affect the integrity and sustainability of downstream waters.
5. Incremental contributions of individual streams and wetlands are cumulative across entire watersheds, and their effects on downstream waters should be evaluated within the context of other streams and wetlands in that watershed.

Consultants hired by Northern Pass delineated 55 wetlands throughout all of Bethlehem. In their Wetland Permit Application (Appendix 31), they noted approximately 90 acres of wetlands were delineated in three towns - Bethlehem, Whitefield and Dalton. This acreage represents 29.9% of the total land area surveyed (331.6 acres). In Bethlehem along the proposed above ground transmission line section wetlands ranged from less than 10 square feet to several acres. Some of the larger wetlands extend far beyond the ROW into a diverse matrix of forested, scrub-shrub, emergent, open water, and riparian habitat. All wetlands were not delineated beyond the ROW due to private landowner considerations and rights. Consultants assessed each wetland functionality based on 14 parameters outlined in the *Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire* manual.³

³ The *Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire* (NH Method) provides communities, conservation groups and professionals a practical method for evaluating wetland functions. Originally published in 1991, the NH Method was first revised in 2011 and updated in 2012 and 2013. It is currently being updated in 2015.

Table 7. Summary of Proposed Direct Permanent and Temporary Impacts by Town

Town/City	Permanent Impact Area		Temporary Impact Area	
	SF	Acres	SF	Acres
Allenstown	148	<0.01	93,207	2.14
Bethlehem	16,908	0.39	246,678	5.66
Bridgewater	50	<0.01	28,945	0.66
Bristol	64	<0.01	51,489	1.18
Canterbury	42	<0.01	82,788	1.90
Chester	0	0.00	9,935	0.23
Clarksville	101	0.00	80,594	1.85
Concord	501	0.01	319,701	7.34
Dalton	369	0.01	147,447	3.38

This table was copied directly from the Wetland Permit Application. It shows the total permanent and temporary impacts to wetlands throughout all of Bethlehem. SF = Square feet. The consultants classified four of these wetlands as high quality wetlands.

Based on our field assessment and review of submitted maps, wetlands were accurately delineated and documented. However, there are concerns with permanent and temporary impacts on all of these wetlands, particularly those which are part of perennial or intermittent streams and those that extend beyond the ROW boundaries. Many of the larger wetlands have active beaver populations and contain series of beaver pond systems. Disruption of these wetlands will not only affect the impact area, but also areas downstream, and in some cases upstream habitats.

Although temporary and permanent impacts on all wetlands should be assessed, we noted five significant Palustrine and Riverine wetland complexes which are a special concern based on the following:

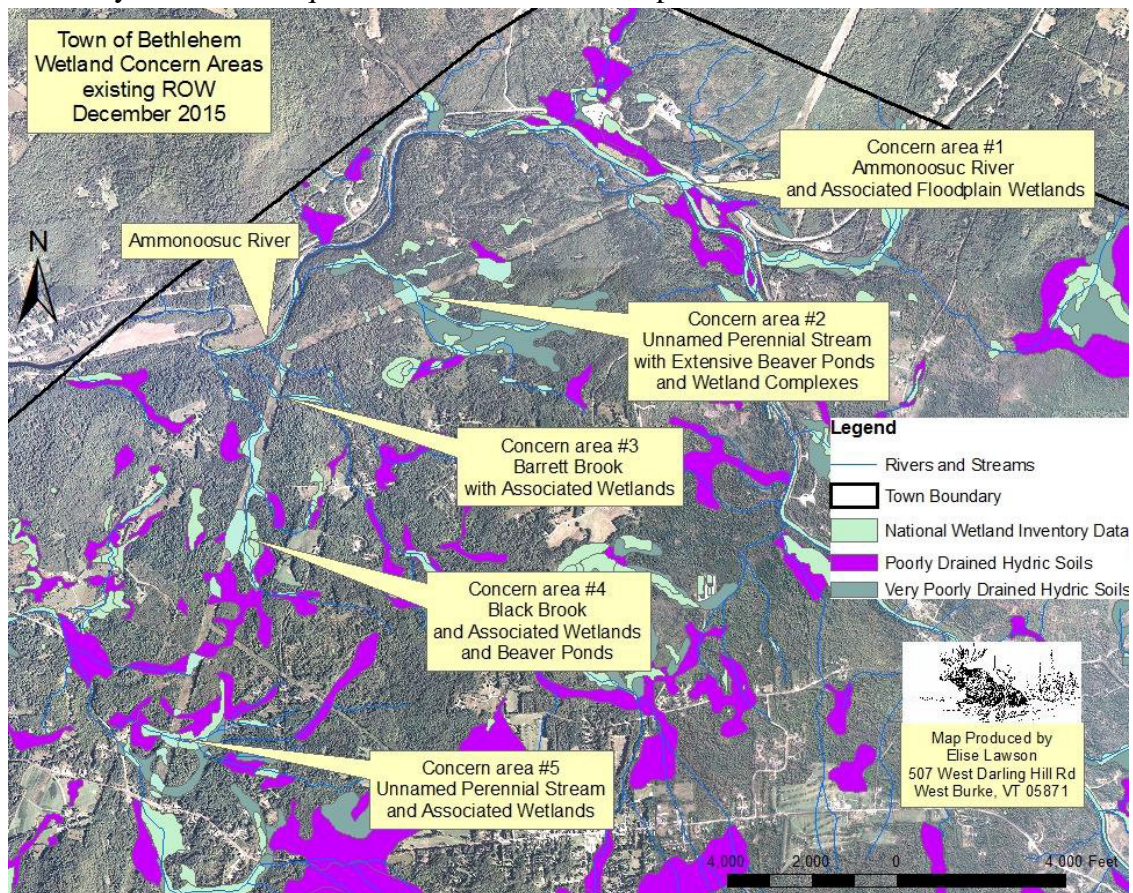
- Wetlands extend through and beyond the ROW. Impacts in immediate area will affect wetland diversity, quality and function downstream.
- Existence of perennial streams (three named and two unnamed)
- The flow of water all leads to the Ammonoosuc River with one of these wetlands being Ammonoosuc River and floodplain area

Based on field work and concern for wetland connectivity, water quality, and biodiversity, wetlands are shown on the map below and at the end of the report. They include:

1. **Concern Area #1:** Includes the Ammonoosuc River and associated floodplain wetlands. There are 1,765 acres of aquifer associated with this section of the Ammonoosuc River, wetland, and floodplain system. In 2006 the Ammonoosuc River was designated into the New Hampshire Rivers Management and Protection Program (RMPP). The Rivers Management and Protection Act of 1988 (RSA 483) established the RMPP based on a two-tier approach to river management and protection: state

designation of significant rivers and protection of instream values and local development and adoption of river corridor management plans to protect shorelines and adjacent lands.

2. **Concern Area #2:** Includes an unnamed perennial stream with extensive beaver ponds and wetland complexes – forested, scrub shrub, emergent and open water. The stream flows directly into the Ammonoosuc River. If water quality is degraded during construction it will directly affect the water quality of the Ammonoosuc River downstream.
3. **Concern Area #3:** Barrett Brook and associated wetlands. Barrett Brook begins along the north side of Mt. Agassiz and flows through the Town Forest. After crossing the ROW, it enters the Ammonoosuc River 1,000 feet downstream.
4. **Concern Area #4:** Black Brook and associated beaver ponds and wetlands that extend well beyond the ROW – diversity of forested, scrub-shrub, emergent and open water wetlands. Black Brook originates between Cherry Valley Road and Prospect Street. It flows directly into the Ammonoosuc River 2,000 feet after leaving the ROW.
5. **Concern area #5:** Unnamed perennial stream and associated wetlands. The stream flows into Baker Brook, which then flows into the Ammonoosuc River. There are nearly 79 acres of aquifers associated with this perennial stream.



Map of the larger wetland complexes all containing perennial streams. The map shows the location of the 5 areas identified with greater concern for wetland and adjacent upland impacts.

Concerns with both temporary and permanent impacts on all wetlands, but especially the five areas shown above are the following:

1. Road construction which will increase public access to some of these areas and could cut off aquatic connectivity
2. Loss of biodiversity not only to wetlands, but also adjacent upland plant and animal communities
3. Increased opportunities for invasive species to establish
4. Erosion and stream bank destabilization at the site, as well as sedimentation downstream in all intermittent and perennial streams
5. Aquifer degradation. Regardless of the size, all aquifers need special consideration to ensure good water quality now and into the future. Given the worldwide water crises we are experiencing, all aquifers should be considered potential drinking water sources.
6. Impairment of surface water quality in the stream itself and in the Ammonoosuc River downstream from the potential impact area



Open water, emergent, scrub shrub and forested wetland complex is found across the ROW, but also extends well beyond the ROW. It is part of a perennial stream named Black Brook. Black Brook has a series of beaver ponds associated with it. The perennial stream originates between Cherry Valley Road and Prospect Street, and has its confluence with the Ammonoosuc River in Bethlehem. It is a 37 acre wetland, most of which is adjacent to and throughout the ROW. Impacts to this wetland would be significant.

Wetland and Wildlife Assessment, Bethlehem, NH



Barrett Brook crossing the ROW. Barrett Brook originates on the sides of Mt. Agassiz, flows through the Town Forest, and has its confluence with the Ammonoosuc River all within Town boundaries. It is a healthy, cold-water trout stream.



The Ammonoosuc River in Bethlehem. This photo was taken from the Prospect St. Bridge upstream from the NP proposed crossing. The largest stratified drift aquifer in Bethlehem is under the Ammonoosuc River and surrounding area which could be impacted by the construction. The Ammonoosuc River has also been designated by the State of NH as a River of special protection.

If the project is approved to move forward, careful monitoring of the entire area is crucial to help minimize these effects on wetlands, upland buffers, surface water, and ground water quality.

Vernal pools

Vernal pools are distinct, often isolated, and important wetland types. Vernal pools provide essential breeding habitat for certain amphibians and invertebrates such as wood frogs (*Rana sylvatica*), yellow spotted salamanders (*Ambystoma maculatum*), marbled salamanders (*A. opacum*), and fairy shrimp (*Branchinecta lynchi*). These creatures depend on vernal pools as breeding sites because they are only temporary water bodies preventing fish and other aquatic predators from taking up residency. Reptiles such as Wood turtles (*Glyptemys insculpta*) also rely on vernal pools as an important feeding area in early spring. Vernal pools fill annually from precipitation, runoff, and rising groundwater, typically in the spring and fall. By mid-summer, however, these wetlands are typically dry, making them a dynamic system inhabitable to specifically adapted plant and wildlife species. For this reason many unique, rare, threatened, and endangered species are linked to this wetland type. They are common in New Hampshire, and the State recognizes their value as important habitat.

Unfortunately, we were unable to document vernal pools during the November 24 site visit. They were documented by NP consultants in May-June 2011. A summary of impacts on vernal pools is shown below taken directly from the Wetland Permit application.

Table 12. Summary of Direct Impacts to Vernal Pools by Town

Town	Permanent Impact (SF)	Temporary Impact (SF)
Bethlehem	0	606
Chester	0	0
Deerfield	0	4,595
Dixville	0	510
Dummer	0	787
Lancaster	0	167
Londonderry	1,188	0
Millsfield	0	425
Northumberland	13	492
Pittsburg	0	2,213
Stark	7	2,208
Stewartstown	0	1
Whitefield	0	53
Total (SF):	1,208	12,056
Total (Acres):	0.03	0.28

The four main concerns regarding impacts on vernal pools are:

1. It is very difficult to assess the effects of temporary impacts on vernal pools. Based on the field inventory, there are likely many vernal pools in the ROW and work could impact them for longer than projected.
2. Vernal pools were only documented during one season. Based on a four year study done by Watershed to Wildlife, Inc., John and Elise noted a wide variance in hydrology in many of the vernal pools inventoried over the four years. Some may have been missed, or more likely the reported size could be incorrect.
3. It is also important to assess the upland buffer around vernal pools to determine the effect on the species that not only breed in the pool, but also live most of their lives in the surrounding upland and wetland areas.
4. There could be permanent impacts if work on the transmission lines occurs during the breeding season or during time when the egg masses, insect larvae, crustaceans, tadpoles, salamanders, etc are developing and require the water level to be undisturbed for a period of time.



Vernal pools are a subset of wetlands with unique characteristics that support specialized sensitive species, whose existence relies on adjacent uplands as well as the vernal pool. Although not confirmed because of the time of year, there is a probable vernal pool adjacent to the Alder shrubs in the middle of the ROW.

Stratified-Drift Aquifers

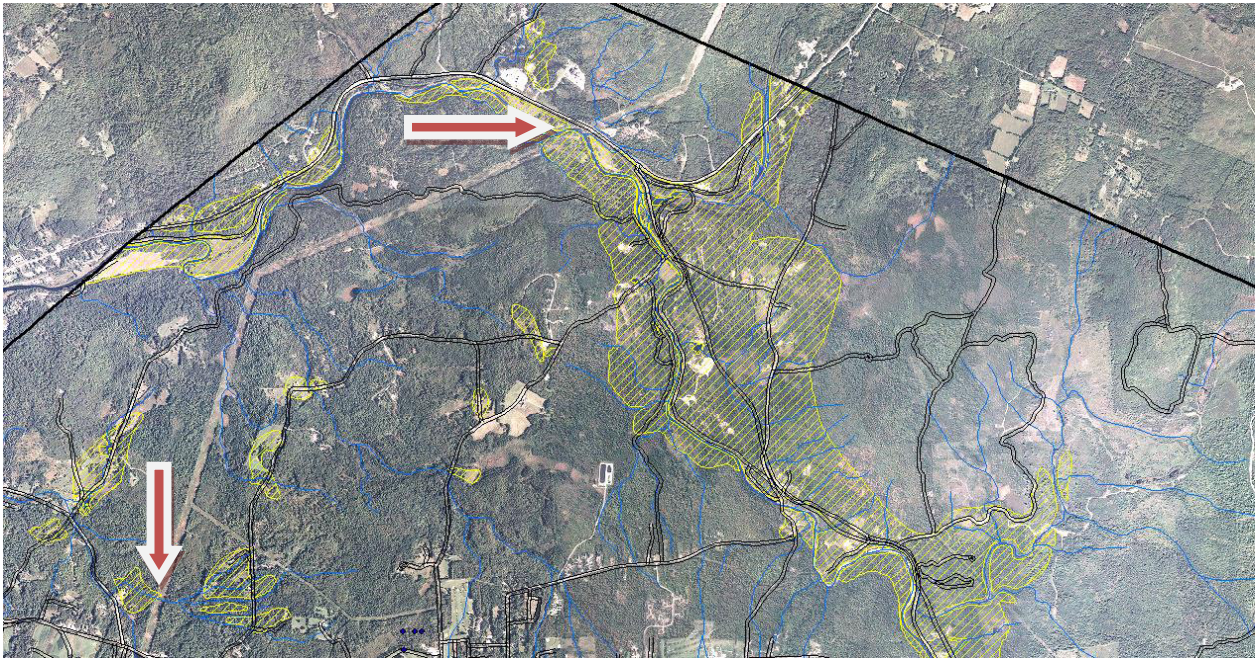
There are three types of groundwater aquifers: Stratified-drift; till; and bedrock. The basic difference is that stratified drift and till aquifers are composed of unconsolidated glacial deposits (loose earth materials), while bedrock aquifers are solid rock. In stratified drift aquifers, the materials are sorted sand and gravel. In till aquifers, the material is a gravel, sand, silt and clay mixture. Bedrock aquifers contain fractured rock. Stratified-drift aquifers are an important source of ground water for commercial, industrial, domestic, and public-water

supplies in the State of New Hampshire. Approximately 14% of land surface in the State is underlain with stratified-drift aquifers.

Wells used by communities and private landowners draw groundwater from aquifers. The stratified-drift aquifers represent the greatest potential groundwater source for the Town of Bethlehem. These aquifers contain potential usable water sources for municipal purposes and should be protected to insure their future quality and availability.

Approximately 6,175.7 acres (9.7 mi²) or nearly 11% of the area of Bethlehem is underlain with Stratified-drift aquifers. The majority lie along the Ammonoosuc River, with smaller ones along Barrett, Baker, and Black Brooks. In Bethlehem the majority of aquifers are made up of sand material with a small amount containing glacial till material. Stratified drift aquifers consisting of sand material tend to be more porous and have a higher potential for quicker transmissivity and recharge. Bethlehem is fortunate to have these potential drinking water sources. Runoff, erosion, and soil compaction from this proposed project could all contribute to degradation of water quality in these aquifers.

The map below shows two specific areas where aquifers could be degraded during construction of the transmission lines. The northern proposed project area is along the Ammonoosuc River, which is part of the largest aquifer in Town.



Aquifers (shown in yellow) are found mostly under the Ammonoosuc River, but also under some of the smaller perennial streams on the southern part of the proposed above-ground transmission lines in Bethlehem. The aquifer in the northern portion of Bethlehem, shown with the upper arrow, is part of the largest aquifer in Town.

Wildlife

All living things need food, water, cover, a space to survive, and a place to raise their young. The area where an organism lives and meets its basic needs for survival is called its habitat. Different species often have different requirements for their habitat. With increasing development by humans, habitats are rapidly disappearing and becoming less able to support life. Habitat loss is considered to be the number one cause in species decline.

The diversity and abundance of wildlife is directly correlated to the diversity and richness of habitat, plant community types, and vegetation. The Town of Bethlehem contains diverse and unfragmented wildlife habitat, in part due to the White Mountain National Forest, and in part thanks to the Town's Master Plan.

The concern for wildlife with the proposed project by Northern Pass is primarily the displacement of many wildlife species during construction. During the November 24, 2015 site visit, most of the existing poles had been marked by black bear. Fur, bite marks and/or claw marks were noted on all random poles examined. Deer and coyote sign was also abundant. Due to the time of year and weather condition, bird surveys were not completed.

Many wildlife species tend to follow the edges of wetlands and streams. The five largest complexes noted above, all cross the existing ROW. It follows that further development of the ROW will cut off travel along these wetlands and streams, at least temporarily, and possibly for long periods of time. Moreover, improvement of roads into the area will increase the likelihood of people driving along the ROW which will further impact wildlife negatively.



Black Bear often mark wooden poles along powerlines. This photo was taken along the ROW in Whitefield NH during field work of an NRI.

Christmas Tree and Garland Businesses

Separate from natural resources, but another important consideration was discovered during the November 24, 2015 field work. Elise and John met two separate Christmas tree managers. They were working within the existing ROW cutting balsam fir trees and bows for sale. These products were selling as far south as Florida. One man discussed that he had been managing Christmas trees under the powerlines for nearly 15 years. He spends the summer and fall trimming, and then has a busy November and December cutting trees and bows for sale. He was concerned about his business with the construction of Northern Pass, which would run directly through the trees.

CONCLUSION

Based on our recent and past fieldwork in Bethlehem, and GIS analyses, we believe there could be substantial negative impacts from proposed construction along the transmission line ROW through Bethlehem, New Hampshire. The extent of the negative impact on all types of wetlands and vernal pools cannot be determined without comprehensive studies to provide science based data on several environmental components that make up the rich diverse matrix of the area. Because the project is so extensive throughout the North Country, the cumulative effects of this work could be quite detrimental to wetlands, wildlife habitat and wildlife movements. If the project moves forward, at minimum, there should be careful monitoring by a biologist to ensure best management practices. The monitoring should continue for at least 3 to 5 growing seasons until the area has stabilized with a goal of revegetation with native, non-invasive species, good water quality, and no erosion.

Town of Bethlehem
Wetland Concern Areas
existing ROW
December 2015

Concern area #1
Ammonoosuc River
and Associated Floodplain Wetlands

Ammonoosuc River

Concern area #2
Unnamed Perennial Stream
with Extensive Beaver Ponds
and Wetland Complexes

Concern area #3
Barrett Brook
with Associated Wetlands

Concern area #4
Black Brook
and Associated Wetlands
and Beaver Ponds

Concern area #5
Unnamed Perennial Stream
and Associated Wetlands

Legend

- Rivers and Streams
- Town Boundary
- National Wetland Inventory Data
- Poorly Drained Hydric Soils
- Very Poorly Drained Hydric Soils



Map Produced by
Elise Lawson
507 West Darling Hill Rd
West Burke, VT 05871

4,000 2,000 0 4,000 Feet

3.0 Project Specific Work within the Protected Shoreland

The Northern Pass project area extends from the international border of Canada and the United States in Pittsburg, New Hampshire to Londonderry, New Hampshire. The Project will require work within the 250 foot protected shoreland of multiple waterbodies. This application includes information related to the work within an existing transmission ROW that intersects the Protected Shoreland of Miller Pond in Bethlehem, NH along the edge of the pond.

The Project seeks to take advantage of existing transmission and road ROW in order to minimize environmental and other impacts of the Project. The underground transmission line will be located in the Shoulder or roadway of Route 302 and should not require limbing or trimming of vegetation for installation as this area is already a maintained ROW.

Underground cables will be installed using a combination of construction techniques including direct bury of the cable, installation of the cable in a duct bank, or the use of trenchless technology (directional boring and jack and bore). These techniques result in cables being buried at different depths. Direct-buried cable is installed approximately four feet below grade. The depth of duct banks varies, but these will have at least 2.5 feet of cover. Cables installed via jack and bore will be approximately 10 to 15 feet below grade. Directional boring sections will be installed at a maximum depth of approximately 65 feet below grade, and will be used primarily for crossing under large perennial streams and rivers. Exact depths may be adjusted during final design. Jack and bore and directional bore require installation pits for construction. Direct bury and duct bank installations require permanent splice boxes or vaults spaced approximately every 1,800 feet to allow for maintenance.

3.1 Miller Pond (Baker Brook Pond)

Miller Pond in Bethlehem is at the border between the Overhead C1 portion of the project and the UG1 Underground Line portion of the Project. At this shoreland site Miller Pond is classified as a palustrine wetland with an unconsolidated bottom (PUB) and a fringe of emergent vegetation (PEM1). The shoreland of Miller Pond is owned by the Town of Bethlehem, and old camps are present on the north and east shore. Route 302 is also within the shoreland on the north side of the pond. The land adjacent to the ROW is residential and forested. The Natural Heritage Bureau identified one element occurrence within a half mile of this shoreland crossing. West of the established right of way, the Natural Heritage Bureau identified the S3, state species of special concern, *Glyptemys insculpta* (Wood Turtle) within a half mile of the protected shoreland buffer of Miller Pond. Care will be taken during all construction to avoid direct impacts to all reptiles. The Project continues to consult with NH Fish and Game regarding protected wildlife species.

The land in the vicinity of the project is Route 302, which is owned by the State of New Hampshire and is surrounded by residential and commercial lots. The existing PSNH ROW crosses Miller Pond, but the new Northern Pass line will not. Instead, it will approach the pond from the north, but then transition to an underground cable at Transition Station 5 adjacent to the ROW, and then head west under Route 302. A portion of the transition station, an access