STATE OF NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2015-06

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

PREFILED SUPPLEMENTAL TESTIMONY OF

MICHAEL LEW-SMITH, JEFF PARSONS,
MICHAEL AMARAL AND SCOTT REYNOLDS

ON BEHALF OF
COUNSEL FOR THE PUBLIC

April 17, 2017

Michael Lew-Smith

Q. Please state your name.

A. My name is Michael Lew-Smith.

Q. Have you testified previously in this docket?

A. Yes.

Jeff Parsons

Q. Please state your name.

A. My name is Jeff Parsons.

Q. Have you testified previously in this docket?

A. Yes.

Michael Amaral

Q. Please state your name.

A. My name is Michael J. Amaral.

Q. Have you testified previously in this docket?

A. Yes.

Scott Reynolds

Q. Please state your name.

A. My name is Dr. D. Scott Reynolds.

Q. Have you testified previously in this docket?

A. Yes.

Panel Testimony

Q. Have you reviewed the updated Project layout and the Plant Protection avoidance and minimization measures submitted by the applicant dated 3-1-2017?

A. Yes.

Q. With respect to impacts on the state endangered licorice goldenrod (*Solidago odora*) population, does any of this updated information change the conclusions you stated in your original report?

A. No. In our report we stated that the Applicants have failed to show that any steps were taken to avoid impacts to this state endangered species. The revised layout does not include any avoidance measures. For example, the access road in between nearby structures (#3132-166 and 3132-165) bisects what remains of this population; shifting the access road to the west side of the right-of-way ("ROW") where there is already disturbance would avoid impact to these plants. However, this was not proposed in the new layout. The best management practices ("BMP") state that for the licorice goldenrod, matting "should" be used and seasonal restrictions would be adhered to "to the extent practicable". No actual commitments to these measures are presented in these BMPs. Since no avoidance measures have been proposed and no actual commitments have been made to employ minimization measures, it is my opinion that the effects to this species are unreasonable and adverse.

Q. Does any of this updated information change the conclusions you stated in your original report with regard to impacts on the red threeawn (*Aristidia longespica var. geniculata*)?

A. No. In our report we stated that the Applicants have failed to show that any steps were taken to avoid impacts to this state threatened species. The revised layout does not include any avoidance measures. The BMPs currently state that seasonal restrictions to protect this species are "preferred". A "preference" for a seasonal restriction is not commitment to such a restriction. Without an actual assurance by Applicants, it is possible that no minimization or mitigation measures will be employed. In addition, the BMPs make no mention of other standard techniques for rare plant conservation such as collection of seed prior to disturbance, establishment of conservation areas or re-seeding areas post-construction. Since there are practical measures that could be used to avoid or minimize impacts to this endangered species, but no commitments have been made to do so, the Project as proposed would have an unreasonable adverse effect on this species.

Q. Have you reviewed the new proposed layout in relation to the impacts to the wild lupine (*Lupinus perennis*) populations in Pembroke and Concord? And if so, what is your opinion about that new layout?

A. Yes, we have reviewed the new proposed layout. Regarding the Pembroke population, as we mention in our original report, the proposed access road cuts through the heart of this lupine population. The new layout includes only minor decreases in impacts. It does not shift impacts to the existing access road or re-route the access road to completely avoid this patch of lupine. Both of these measures appear to be practicable alternatives. Regarding the impacts to the population in Concord, an access road was rerouted and overall impacts went from 17,451 square feet to 15,625 square feet, a total decrease of 1826 square feet or a 10% decrease. However, no avoidance measures were proposed for the majority of the impacts, even though avoiding these impacts by moving tower structures to the north appears to be a practicable alternative. It is our opinion that only minor changes to the layout have been presented and that further avoidance of the lupine plants is possible and practicable but has not been proposed.

Q. Have you reviewed the new BMPs dated 3/1/2017 in relation to the impacts to the wild lupine populations in Pembroke and Concord? And if so, what is your opinion about the BMPs?

A. Yes, we have reviewed the BMPs dated 3/1/2017. This document says work conducted when the ground is frozen "is preferred." It also says seasonal restrictions to minimize impacts to lupine be employed "to the extent practicable." There are no clear commitments by Applicants in the BMPs to minimize impacts to this state threatened species. Without an enforceable commitment by Applicants, there is no assurance that minimization measures will be employed.

Q. Does any of this updated information change the conclusions you stated in your report with regard to impacts on the wild lupine populations?

A. No. The SEC considers the "significance of the affected [resource]" when assessing potential impacts (Site 301.14 e). Since the wild lupine is a state threatened plant, provides necessary habitat for a state and federally endangered insect and a state endangered insect, the lupine plants should be considered of high significance. The lack of avoidance of impacts and the lack of enforceable commitments to minimization measures lead us to the conclusion that the effects on this significant resource are unreasonably adverse.

Q. Does any of this updated information change the conclusions you stated in your report with regard to impacts on the butterfly milkweed (*Asclepias tuberosa*) population?

A. Yes. One individual of this state endangered species was located near the edge of a work pad in Concord and proposed to be impacted. The new layout has reconfigured the work pad to avoid impacts to this species. In addition, procedures have been outlined in the BMPs regarding flagging and fencing of rare plant locations adjacent to impact areas, conducting contractor training programs, and maintaining open communication between the Environmental Monitor ("EM") and contractors. If all of these procedures are conducted as outlined, the Applicants will have taken practicable measures to avoid impacts to this species.

Q. Does any of this updated information change the conclusions you stated in your report with regard to impacts on the blunt-leaved milkweed (*Asclepias amplexicaulis*) population?

A. Yes. The original layout avoided impacts to this species, though both populations were in very close proximity to construction activities. Procedures have been outlined in the BMPs regarding flagging and fencing of rare plant locations adjacent to impact areas, conducting contractor training programs, and maintaining open communication between the EM and contractors. If all of these procedures are conducted as outlined the Applicants will have taken practicable measures to avoid impacts to this species.

Q. Does any of this updated information change the conclusions you stated in your report with regard to impacts on the small whorled pogonia (*Isotria medeoloides*)?

A. No. In our report we state that the Applicants failed to conduct an adequate inventory to determine the presence or absence of this globally threatened species. No proposal to conduct such an inventory has since been proposed by the Applicants. Lacking a sufficient inventory, it is impossible to conclude that the Project would not have an unreasonable adverse effect on this species.

Q. Have you reviewed the new BMPs dated 3/1/2017 in relation to impacts to the northern black racer and eastern hognose snakes? If so, what is your opinion about the BMPs?

A. Yes, we have reviewed the BMPs as related to these species. The BMPs outline procedures for excluding snakes from construction activity to minimize potential impacts to adult individuals. They also outline seasonal restrictions for protecting known hibernacula and requiring contractor training on recognizing and protecting these threatened and endangered species. If all of these procedures are conducted, it is our opinion that potential adverse effects on these species will not be unreasonable.

Q. Have you reviewed new BMPs in relation to impacts to the Blanding's, spotted and wood turtles? If so, do these BMPs change the conclusions you stated in your report with regard to impacts on these species?

A. Yes, we have reviewed the BMPs with regards to impacts to these rare, threatened and endangered turtle species and have two lingering concerns.

The BMPs state that the EM will search "woody and grassy wetland vegetation" for these species and exclude them from the construction areas. In fact, turtles should be excluded from construction areas in ALL wetland types. While, fencing turtles out of deepwater wetlands may not be feasible, steps can be taken to exclude turtles from these wetland types while construction mats are installed.

Secondly, the BMPs do not clarify the Applicants' proposed mitigation measures for habitat loss. The BMPs do address potential construction impacts to turtle nesting habitat by fencing appropriate areas prior to May 15th to prevent turtles from using these areas. However, there is no mention of providing any alternative nesting habitat to compensate for these potential losses, even though Normandeau's mitigation report states that the Applicants will "create or protect suitable [turtle] nesting habitat".

Given these two issues, it is our opinion that the BMPs do not go far enough to protect Blanding's and Spotted turtles.

Q. Have you reviewed the new proposed layout in regards to impacts on vernal pools? If so, what is your opinion of that layout?

A. Yes, we have reviewed the new layout as related to vernal pools. The new layout avoids impacts to three vernal pools. However, our analysis indicates that impacts to many other pools could have been minimized or avoided, but were not. This includes 15 sites where avoidance or minimization seems practicable and would only require minor shifts in work area configuration or minor re-routing of access roads. Impacts to an additional 5 vernal pools could have been avoided or minimized by shifting the location of structures and associated work areas. It is our opinion that insufficient steps were taken to avoid impacts to this significant wildlife habitat resource.

Q. Have you reviewed the Wetland Restoration BMPs as they relate to Vernal Pools? And if so, what is your opinion of those BMPs?

A. Yes. Disruptions from soil compaction and rutting (even from timber mats) can have long-lasting negative impacts on the functioning of a vernal pool. Although the Wetland Restoration BMPs do not specifically address vernal pools, they do address how a "temporarily" impacted wetland would be restored. The BMPs mention that soil compaction created from construction will be remedied by post-construction tilling. Tilling soils within a wetland is unrealistic and would likely lead to more disturbance, soil compaction and rutting. The BMPs also mention bringing in wetland soils to restore original topographic contours. This technique, however, would not alleviate compacted soils and the negative effects on hydrology. Because the proscribed BMPs do not address the issues of compaction and rutting, it is my opinion that the referenced "temporary" impacts would more likely result in permanent, long-term negative impacts to these wetlands. The BMPs also fail to propose any seasonal restrictions on work within vernal pools.

Q. Do you have other concerns about the vernal pool assessment?

A. Yes. Our report states that the ranking procedure used to identify High Quality vernal pools was inappropriate and inconsistently applied. The updated layout and BMPs do nothing to address this issue. It is our opinion that the High Quality designation as employed did not include all of the high quality vernal pools actually present. Our report also states that indirect impacts to vernal pools were not assessed by Normandeau. These indirect impacts to the vernal pool buffer are an integral part of the significant wildlife

habitat that vernal pools provide. None of the updated information has addressed this deficiency.

Q. Given the above assessment, what is your opinion about the proposed impacts to vernal pools?

A. It is our opinion that vernal pools are fragile wetland systems that constitute a significant wildlife habitat resource. The Applicants have failed to assess the full impact of the proposed development on this habitat and have failed to show that adequate steps were taken to avoid and minimize those impacts. For these reasons, we believe that the impacts as proposed would pose an unreasonable adverse effect on vernal pools.

Q. Have you reviewed the Wildlife Resource BMPs dated 2/28/17 and the General/Erosion & Sediment Control Notes submitted by the applicant and dated 1/24/2017 in relation to potential impacts on the brook floater and eastern pearlshell mussels? If so, what is your opinion about proposed impacts to these mussels?

A. Yes, we have reviewed those documents. The BMPs state that "standard erosion control BMPs will be employed and monitored." To my knowledge, these standard BMPs have not been made available for review. The Erosion & Sediment Control Notes present only broad, non-specific guidelines for preventing erosion and stabilizing sediments during construction and post- construction. The area of concern consists of a new structure proposed to be installed upon a slope within 20' of the banks of the Soucook River, where these state endangered and special concern mussel species were documented. Given the sensitivity of these species to sedimentation, and the potential for sediment discharge from the Project to negatively impact these species, site specific erosion prevention and sediment control specifications need to be developed. Without these measures, unreasonable adverse impacts to these species may occur.

Q. Have you reviewed the updated Project layout and the Wildlife Protection BMPs submitted by the applicant dated 2-28-2017?

A. Yes, we have reviewed this information.

Q. Does any of this updated information change the conclusions you stated in your report with regard to impacts on the deer wintering areas ("DWA") or moose concentration areas ("MCA")?

A. No. The updated layout consists of only minor adjustments which do not affect known deer wintering areas or moose concentration areas. The updated plans do not address the deficiency of data as related to properly identifying all deer wintering areas along the Project route. The BMPs fail to provide effective measures to avoid, minimize, or mitigate adverse direct and indirect effects of the Project on DWAs and MCAs. The BMPs state that the EM will check known DWAs and MCAs prior to work being initiated in an area. Throughout the majority of the Project route, the field check by the EM will be restricted to the existing ROW. Deer and moose present in these habitats that are adjacent to, but not actually in, the existing ROW will be indirectly negatively impacted by construction activities in the ROW. In addition, construction within DWAs and MCAs where animals are present will only be avoided "where practicable." The term "where practicable" is not defined and could result in negative impacts to deer and moose from construction during the critical winter months. The BMPs fail to provide commitments to seasonal restrictions on construction near these habitats and fail to develop measures that restrict winter-time recreation use on the Project ROW. Given these factors, none of the new information changes the conclusions stated in our report that the Project as proposed would have an unreasonable adverse effect on these highly significant wildlife habitats.

Q. Are deer or moose endangered or threatened species in New Hampshire, and if not why are you making an opinion about their wintering and concentration areas?

A. No, deer and moose are not endangered or threatened species. As discussed in our report, however, deer are a prominent component of New Hampshire's wildlife community and moose are an iconic New Hampshire species recently in significant decline. We address impacts to their habitats because they are “significant habitat resources” within the meaning of Site 301.07(c)(3).

Q. Does any of this updated information change the conclusions you stated in your report with regard to impacts on mast stands?

A. No. The updated layout consists of only minor adjustments which do not affect impacts to mast stands. The BMPs do not address mast stands at all. As stated in our report, the nature and extent of hard mast stands have not been adequately identified within the

Project area. The new information provided by the Applicants do nothing to address this issue. It is therefore not possible to evaluate the nature, extent and duration of potential effects of the Project on this resource. In addition, since the BMPs have failed to address impacts to this resource, the Project does not represent the best practical and most effective measures available to avoid, minimize, or mitigate the adverse impacts on this significant habitat resource.

Q. Does any of this updated information change the conclusions you stated in your report with regard to impacts on American marten?

A. No. The updated layout consists of only minor adjustments which do not affect impacts to American marten habitat. The BMPs do not address the American marten, marten habitat, or any additional ROW construction or management issues related to the potential impacts to the American marten. The Applicants have failed to demonstrate that sufficient efforts to avoid important American marten habitat have been made. In addition, the Applicants have not committed to the development and implementation of restrictions on winter-time motorized vehicle use of the ROW and Project access roads. Finally, the Applicants have also failed to confirm that the proposed mitigation parcels provide accessible high quality marten habitat. Given these issues, it is our opinion that the Project, as proposed, would have an unreasonable adverse effect on this species.

Q. Does any of this updated information change the conclusions you stated in your report with regard to impacts on lynx habitat?

A. No. The updated layout consists of only minor adjustments which do not affect impacts to lynx habitat. The BMPs provide no detail on how the presence of lynx will be determined, or if non-construction buffers protecting lynx denning within the proposed ROW will be provided. As written, the BMPs would potentially allow construction of the ROW immediately adjacent to denning female lynx and/or the previously identified preferred denning habitat. The BMPs also do not address the potential long-term impact to lynx from the use of ROW by recreational vehicles. For these reasons, we are not able to conclude the Project will not have an unreasonable adverse impact on maternal lynx denning habitat.

Q. Does any of this updated information change the conclusions you stated in your report with regard to impacts on the Persius duskywing skipper and the frosted elfin?

A. No. The new layout includes a reduction in impacts to areas that contain wild lupine, a host plant for these species. This reduction in impacts is positive. However, as stated in our report, no inventories for these species were conducted, and the new information presented does nothing to address this deficiency. Because we do not know the specifics of the populations or locations of the duskywing skipper and frosted elfin, it remains impossible to determine if the proposed BMPs represent the best practicable measures available to avoid or mitigate adverse impacts to these two species. Without this information, it is not possible to conclude that the Project will not have an unreasonable adverse effect on the Persius duskywing skipper and the frosted elfin.

Q. Does any of this updated information change the conclusions you stated in your report with regard to impacts on the pine pinion moth?

A. No. As stated in our report, no inventories for this species were conducted, and the new information presented does nothing to address this deficiency. The impacts from the change in the layout are therefore unknown. In addition, the BMPs do not address the pine pinion moth or the natural community on which it depends and therefore do not represent the best practical measures to avoid or mitigate impacts to this species. Therefore, it is not possible to conclude that the Project will not have an unreasonable adverse effect on this state threatened species.

Q. Have any of the opinions expressed in your testimony or report related to nesting bald eagles, raptors, or herons changed as a result of the new layout and BMPs?

A. No, the layout changes do not alleviate concerns regarding nesting bald eagles, raptors, or herons. The proposed BMPs for nesting eagles, raptors, and herons include an adequate ¼ mile non-construction buffer from active nests during the nesting season, however the BMPs allow for negotiated alteration of the buffer and duration of the restriction. Without the ability to independently review such alterations, we cannot adequately assess the Project's impact on the nesting raptors and herons.

While the BMPs go on to require a survey for active nests prior to work in the nesting season, as previously recommended by Normandeau, there continues to be no methodology or detail provided with which to assesses the adequacy or effectiveness of the proposed survey activities.

We continue to have the opinion that there is insufficient information to fully determine the impacts to nesting raptors, bald eagles and herons.

Q. Do the proposed BMPs represent the best practical measures available to avoid or mitigate direct and/or indirect adverse impacts to nesting bald eagles, raptor and herons?

A. No, the BMPs for nesting bald eagles, raptors, and herons provide only slightly more detail (1/4 mile buffer distance) than the original recommendations by Normandeau and there remains insufficient information to conclude that these represent the best practical measures available to avoid or mitigate adverse impacts to nesting bald eagles, raptors and herons. No mitigation is offered for raptor or heron nests that may be removed outside of the nesting season.

Q. With the proposed new layout and BMPs, are you able to conclude that the Project will not have an unreasonable adverse effect on nesting rate, threatened and endangered ("RTE") bird species such as bald eagles, raptors, or herons?

A. No.

Q. Have any of the opinions expressed in your testimony or report related to common nighthawk changed as a result of the new layout and BMPs?

A. No, the layout changes do not alleviate the potential impact to common nighthawk. The proposed BMPs for common nighthawk reference a "pre-determined" but currently unspecified buffer area around active nests and a pre-construction survey. Neither of these practices includes sufficient detail to allow a conclusion that there will be no impacts to common nighthawks. In addition, our report previously noted the lack of assessment of the extent of potential habitat for nightjar species including common nighthawk, and this issue has not been addressed with the BMPs.

Q. Do the proposed BMPs represent the best practical measures available to avoid or mitigate direct and/or indirect adverse impacts to common nighthawk?

A. No, the BMPs for common nighthawk are very similar to the recommendations already made by Normandeau, but continue to lack the details and specifications necessary to determine that the avoidance and mitigation efforts are sufficient to protect common nighthawk.

Q. With the proposed new layout and BMPs are you able to conclude that the Project will not have an unreasonable adverse effect on common nighthawk?

A. No.

Q. Do the BMPs you have reviewed offer any new avoidance or minimization efforts or restrictions for any other RTE bird species that would change the opinions you expressed in your testimony or report?

A. No, no other RTE bird species are addressed with the 2/28/2017 BMPs.

Q. Have any other Project documents provided since your testimony led you to change the opinions you expressed in your testimony or report regarding RTE bird species?

A. On March 1, 2017, NH Department of Environmental Services ("DES") issued a final decision on parts of the Northern Pass Transmission application that relate to wetland, alteration of terrain, 401 Water Quality Certification and shoreland permitting. This decision included conditions intended to address RTE wildlife, including birds, during work in and around wetlands and streams. The conditions include coordination with NH Fish and Game on time of year restrictions for protected wildlife and restrictions on work in emergent marsh wetlands to avoid disturbances to migratory waterfowl. DES, however, provides no specific recommendations, time restrictions, definitions, or details necessary to determine if the measures taken would be sufficient to protect RTE bird species. To date, the Applicants have offered no BMPs related to wetland dependent RTE listed bird species that might propose specific details intended to meet the DES conditions. Based on the lack of specificity, it remains impossible to determine the impacts to wetland-dependent RTE listed bird species, including pied-billed grebe, and without appropriate habitat assessments and avoidance measures, we continue to believe the Project may have an unreasonable adverse effect on RTE bird species.

Q. Have you reviewed the new proposed layout in relation to the impacts to the Karner Blue Butterfly population in Concord? If so, what is your opinion about those avoidance measures?

A. Yes, we have reviewed the new proposed layout in two discreet locations. These are the existing Eversource and proposed Project ROW in the immediate vicinity and south of Pembroke Road in Concord (known as the Praxair or Karner Blue Butterfly Main Site), and along the existing and proposed ROW in Pembroke at the NH Army National Guard Region Training Institute parcel, where a lupine patch (LP-17) is known to occur.

This assessment is based on revisions to the location of temporary access paths and work pads that will result in small reductions in the extent (and location) of habitat disturbance to lupine and Karner Blue butterfly areas. Analyses performed by Arrowwood Environmental indicate that the extent of lupine habitat impacts at the Main Site will be reduced by 1,826 square feet (from 17,451 sq. ft. in the original proposal to 15,625 sq. ft. in the revised proposal). This amounts to an approximate 10% **reduction** in area occupied by lupine that will experience temporary impacts from construction of the Project in this reach of the ROW.

There was also a small reduction of impact at the NH Army Guard RTI parcel (LP-17). A January 30, 2017 Lee Carbonneau (Normandeau Assoc.) to Amy Lamb (NH DRED) email simply states “a passing zone was removed to decrease impacts to LP-17.” Reduction of impacts at this location is a positive but difficult to quantify change for lupine conservation generally. As this lupine patch does not currently have KBBs associated with it, this Project revision will not result in a near-term reduction of effects on the KBB.

If the Normandeau lupine data are of sufficient detail, an additional analysis that would be informative would be to explain how a 10% reduction in “lupine polygon area disturbance” translates to a reduction in the number of actual lupine plants or stems, and reduction in the number of KBB eggs affected by the Project. As wild lupine tends to

occur in non-random clumps of densely packed stems (in other words, patches of plants in a scattered distribution), it would be overly simplistic to assume that reducing polygon area impacts by 10% would reduce lupine plant impacts from the estimated 330 plants to 297, and KBB eggs taken from 208 to 187. However, absent any additional analysis, that is the only quantification of "reduced" effects on lupine plants and KBB eggs that can be done. Assuming that 10% fewer lupine plants would be affected from implementation of the revised work plan, the majority of lupine in this reach of the ROW (~56%) will "still" be affected by construction activities (down from 62% in the original proposal).

A 10% reduction in the extent of the area occupied by lupine that will be disturbed by construction of the Project is a very modest, but still positive change. In my opinion, however, it demonstrates less than a rigorous attempt to avoid and minimize the effects of the Project on lupine and the KBB through a spatial change in construction activities at the Main Site. Because much of the area within this reach of the ROW is relatively flat and soils are very well drained, there are few apparent physical restraints that would prevent construction vehicles from working more strategically in this area, further avoiding mapped lupine and KBB locations. Permanent removal of habitat for lupine and the KBB from the Project (an estimated 14 square feet) is a minor impact and remains unchanged between the original and the revised proposal.

An equally important means of avoiding and minimizing effects on lupine and the KBB is to conduct all vegetation clearing and ground disturbing construction activities during the non-growing season, preferably when the ground is either frozen or has snow cover, and with the added prevention measure of using timber mats to minimize ground disturbance in areas supporting lupine and New Jersey tea. More discussion on this topic is found below.

Q. Have you reviewed the new BMPs dated 2/28/2017 and 3/1/2017 in relation to the impacts to lupine and the Karner Blue Butterfly populations in Concord? If so, what is your opinion about the BMPs?

A. Yes, we have reviewed the BMPs dated 2/28/2017 for lupine and 3/1/2017 for the KBB and have also reviewed the March 1, 2017 letter from Rene Pelletier, Assistant Director Water Division of DES, to Pamela Monroe, Administrator, NH Site Evaluation Committee ("SEC") .

With regard to state-threatened lupine occurrences at the Main Site in Concord, the BMPs are insufficient to protect the KBBs that are associated with these plants. Specifically, vegetation clearing and ground disturbance work during winter (i.e., December 21 to March 20) and preferably under frozen ground conditions should be a requirement and not left to the applicant to determine if it is "practicable" or not. In the event of unforeseen circumstances that demand revisiting a "winter only" work schedule requirement, the federal and state natural resources agencies must be consulted to consider granting a specific exemption. For example, in the event that the ground is both unfrozen and without snow cover during the scheduled winter construction period at the Main Site, then use of timber mats and work dates from December 15 -March 31 for example, could be acceptable. The basis for recommending changes in the dates (from November 1-April 15) is that ground in well drained pine barren soils in Concord is rarely frozen and /or with snow cover on November 1. Lupine is among the first plants to sprout and "green up" in the Concord Pine barrens (pers. observation) and construction as late as April 15 may damage or destroy emerging plants unnecessarily.

The above comments similarly pertain to BMPs for the KBB dated 3/1/2017. Work at the Main Site should be scheduled for winter when the ground is either frozen or snow covered, or preferably both. In the event of a mild winter and construction cannot be delayed a year, then after consultation with and approval from federal and state natural resource agencies, construction could occur during the period December 15-March 31 (e.g.,) and ground disturbance reduced through the use of fencing and timber mats, as noted. Without this schedule and these provisions, we find the BMPs insufficient to protect KBB.

Q. Have you reviewed the Compensatory Mitigation Plan submitted by the Applicants and dated December 2016 in relation to the impacts to the Karner Blue Butterfly? If so, what is your opinion about that Plan?

A. Yes, we have reviewed the Compensatory Mitigation Plan noted above. The proposed 6.9 acre (Z1) parcel on Regional Drive identified for acquisition for wildlife conservation is a highly suitable site for restoration of state listed pine barren insect fauna and flora, and the federally listed KBB, as well as sun-seeking reptiles, such as northern black racer.

There are numerous characteristics that make the parcel Z1 potentially suitable as a compensatory mitigation site. It is located adjacent to the 28 acre- U.S. Fish Wildlife Service KBB conservation easement area on Chenell Drive. Together, these two parcels are contiguous with the 300 + acres under a Conservation Management Agreement for the KBB at the Concord Municipal Airport. Although the Z1 parcel has been partially developed, the sandy soils appear consistent with the well-drained, infertile pine barren soils found throughout this area of the Concord Heights. Common pine barren plants such as sweet fern and pitch pine are already colonizing the site. The location of this parcel immediately across Regional Drive from the NH Distributors Company is also beneficial, as the border (lot set back area) between the NH Distributors and the office park to the north already contains lupine and with management, may function as a corridor that could facilitate movement of KBBs between the 6.9 acre (Z1) parcel and the Main Site.

Another important attribute of the 6.9 acre parcel is that wildlife conservation can be the highest priority for the future management of the site. This is in contrast to the pine barren habitat within the fence at the Concord Municipal Airport and at the Eversource /NPT ROW, where conservation of rare species must occur concurrent with FAA regulations and airport improvements, and periodic vegetation ROW management and disturbance from construction activities (e.g., pole replacement), respectively.

As identified in the Natural Resource Compensatory Mitigation Plan (December 2016, p. 11), the 6.9 acre (Z1) parcel will be conveyed to a natural resource agency or organization, with KBB management responsibilities assumed by NHF&G. Eversource/NPTP will remove the existing foundation and a small area of pavement prior to transferring the parcel. NHF&G's management activities shall be funded by the Applicants to restore pine barren habitat suitable for the KBB and other species at Z1. However, the amount and duration of funding is "to be determined" so its adequacy cannot be determined. Lastly, a specific ROW Management Plan for the pine barrens area has yet to be completed so its sufficiency cannot be evaluated. It is anticipated that the management identified in this Pine Barrens ROW Management Plan will be similar to and shall include the activities outlined in the NHF&G's 2016-2025 Habitat Management and Monitoring Plan - Concord Pine Barrens (Attachment A in Normandeau's December 2016 Mitigation Plan). Funding for restoration at the Main Site to compensate for temporary and permanent lupine and KBB habitat has similarly not been identified, so its sufficiency cannot be determined.

Q. Does any of this updated information change the conclusions you stated in your report and testimony with regard to impacts on the Karner Blue Butterfly population?

A. In our opinion, the Applicants have failed to demonstrate that all reasonable and practicable measures have been taken to avoid and minimize adverse effects on state-threatened lupine and the endangered Karner Blue Butterfly. This includes very minimal avoidance measures and BMPs which do not unequivocally commit to a winter construction schedule at the Main Site, preferably when the ground is both frozen and snow covered. Given the above, our opinion is that the Project continues to have an unreasonable adverse effect on lupine and the KBB at the Main Site.

Q. Have you reviewed the Wildlife Protection BMPs dated 2/28/17 as they relate to potential impacts on bats?

A. Yes. There are two components that relate to bats; they contain the captions 'Northern Long-eared Bat' and 'Small-Footed Bat.'

Q. Are you satisfied with the adequacy of the BMPs related to the Northern Long-eared bat?

A. No. The proposed avoidance activity for the northern long-eared bat is a seasonal restriction (April 15 – September 30) on tree cutting at "known northern long-eared bat locations." We have three primary concerns with regards to this proposal. First, the BMP does not clarify the physical extent of a "bat location." It is unclear whether this refers to individual roost trees or a centralized point with a prescribed buffer zone. Without knowing what a "location" is, it is difficult to determine whether this proposed BMP will provide adequate impact avoidance or minimization. In the US Fish and Wildlife ("USFWS") Service 4(d) Ruling for this species (USFWS, 2016), they stated that habitat conservation measures should include no tree removal within a 150-ft (45-m) radius around known maternity roost trees. Because the Applicants did not conduct the field work necessary to determine maternity roost trees, any habitat conservation zone would need to encompass all potential roost trees within the" location", plus the additional buffer zone prescribed by the USFWS. Given that northern long-eared bats generally move less than 1 km between roost trees and foraging habitat (Ford et al. 2006, Holroyd 2016), we suggest that each "location" should be a 0.5-km radius centered around each sampling location that had evidence for the potential presence of northern long-eared bats.

We also have concerns with the term "tree cutting", as it does not distinguish tree removal from other forest management activities. It is also unclear whether "tree cutting" would include any other site preparation activities, including road construction or blasting activities that may occur in close proximity to potential roost trees. The BMP should clarify which activities would be restricted in proximity to known maternity roost sites. Finally, we have concerns with the limitation of "known long-eared locations" given the deficiencies in the acoustic monitoring surveys. As stated in our report, the Project Wildlife Report Impact Assessment has inconsistencies and omissions that prevent a complete evaluation of total sampling effort, it did not use an approved vetting process to isolate potential northern long-eared bat calls, and it did not conduct follow-up surveys to

identify roosting locations. Therefore, it is difficult to determine whether the known long-eared locations represent the true distribution of this species across the Project site.

Q. Please state your conclusions regarding the BMPs related to the Northern Long-eared bat?

A. The current BMP proposal for northern long-eared bats is a single sentence with three undefined terms. Given concerns regarding the collection and interpretation of the acoustic monitoring, we would recommend that ”known” should include all sampling sites with potential northern long-eared call activity. We would also recommend that the term ”tree cutting” be clarified and extended to include any tree or understory maintenance, construction or blasting activities. Lastly, the term “location” should be clarified to be a 78 ha (1.0 km diameter) site centered on each sampling location. As this definition of “site” would only limit the Project construction within the summer active period, these restrictions would provide adequate protection to the species, be in conformance with the 4(d) Rule of the USFWS, and not pose an unreasonable burden to the Project.

Q. Do you have any concerns about the BMPs related to the Small-footed bat?

A. Yes. The BMP Proposal for small-footed bats has four components. First, it states that any “rocky outcrops with cracks and crevices” be avoided in June and July when flightless young may be present. This seasonal restriction is inconsistent with the proposal for northern long-eared bats. Specifically, the Applicants recommend avoiding roosting habitat throughout the summer active season (April 15 – September 30) for northern long-eared bats. However, for small-footed myotis, they reduce this restrictive window to the period of flightless young (June and July). This narrow restrictive window is based on the assumption that bats “can escape as needed” (Wildlife Report, 10.5.2), which is an assumption that lacks any empirical support and is inconsistent with the general ecology of bats. In our opinion, there is no biological basis for the different seasonal restrictions, as both cases involve the impact of potential roosts containing adult females and their young.

The second component states that when these areas cannot be avoided, a survey should be completed by the "Environmental Monitor" to determine whether bats are present using a protocol approved by the NHFG. According to the BMP proposal, "if no bats are present", construction work can proceed. However, the criteria used to determine whether "bats are present" is not clear. Specifically, the BMP does not state whether it would include any calls at any sampling locations, or only manually-vetted calls identified as eastern small-footed myotis. The BMP should also articulate how a site is determined to have "no bats present" and when construction activities can proceed. Specifically, it should state that construction-related activities must be avoided until the survey was completed, analyzed, and results approved by the NHFG.

The third component of the BMP proposal suggests that construction fencing be used in areas outside of the construction footprint to prevent encroachment of construction activities. This sounds like a prudent precaution, as long as the construction fencing does not interfere with the use of the rocky outcrop by roosting bats or other wildlife.

The Applicants' Wildlife Report states that "no direct impacts to hibernacula will occur as the Project area does not include any known or potential hibernacula for SFBs in its footprint" (Wildlife Report, 10.5.2). However, the BMP proposal states that rocky outcrops with "deep cracks and crevices", deemed as "potential hibernacula" will be avoided from October 14 – April 15 when hibernating bats may be present. Small-footed bats are known to use rocky debris, boulder piles, and rocky outcrops in as hibernacula (Ellison et al. 2003, Roble 2004). Data we have collected from New Hampshire show small-footed bats using exposed rocky outcrops as a hibernaculum throughout the winter months (Reynolds et al. 2017). Therefore, this avoidance window is appropriate; however, the definition of "deep cracks and crevices" would need to be clarified in order for this monitoring to be effective. As it is currently written, the guidelines for evaluating the appropriateness of rocky outcrops as potential hibernacula are subjective, ambiguous, and lack empirical support in the context of the ecology of this species.

Q. Are you aware of other Best Management Practices that may be applicable to the Project?

A. Yes. The most relevant guideline for the northern long-eared bat would be the seasonal restrictions and buffer zones outlined in the USFWS 4(d) ruling and, with exception of a buffer zone, the current BMP proposal is consistent with that document. The most relevant BMP for the small-footed bats are the guidelines released by the British Columbia Ministry of Environment (Holroyd and Craig 2016). The British Columbia BMP identifies three levels of impact: the proposed construction activities for the Project (including blasting and the use of heavy equipment) would qualify as "High Impact". According to the British Columbia BMP guidelines, there should be a permanent avoidance zone of 100-m around any roost sites and seasonal avoidance of maternity sites (May through August) and hibernacula (October through April). In the context of blasting, the British Columbia BMP requires a setback of 2 km from occupied bat roosts unless environmental monitoring is done to ensure that sound concussion levels remain below 150 dB and peak particle velocities are less than 15 mm/sec (Table 4: Holroyd and Craig 2016).

Q. lease state your conclusions regarding the BMP proposal identified under Small-Footed bat?

A. The proposed BMP protocol for the small-footed bat lacks the level of biological understanding that would allow it to be considered a "best management practice". The logic used by the USFWS to protect northern long-eared bats should directly apply to the small-footed bat, and therefore the avoidance period for summer roosting bats should be identical (April 15 – September 30). Because there are no criteria to evaluate "cracks and crevices" as potential summer roosts or hibernacula, occupancy of these sites will need to be determined through acoustic monitoring across an entire year before it will be known whether these features represent critical roosting habitat. In order to avoid direct impact (mortality), acoustic monitoring should be conducted prior to construction but within the same activity period. If no activity is detected over multiple nights that meet USFWS sampling criteria (a minimum of three nights is recommended to minimize the risk of

false negatives: MacKenzie and Royle 2005), then some construction activities may be appropriate.

The biggest concern we have for this species is the absence of criteria and standards for evaluating or monitoring the impact of blasting on these crevice-roosting bats. BMPs do exist that account for both construction and blasting impacts, and these should be incorporated, or modified with justification, into the Project.

Q. Do you recommend that if the Project goes forward an independent environmental monitor (EM) be required and if so describe what you mean by that?

A. Yes we do. Because of the wide variety of species and habitats that will be adversely impacted, the number of wetlands that will be impacted, the variety and complexity of the avoidance, minimization and mitigation plans that will be required, and the sheer size of the Project, an independent firm with sufficient resources and budget should be required to monitor the construction and perform post-construction monitoring. This independent monitor should have the authority to stop work on the Project if environmental conditions are not being met or if unforeseen circumstances arise which adversely affect threatened or endangered species or significant wildlife habitat resources. This independent monitor should be answerable to an entity other than the Applicants. The choice of the EM should be approved by the SEC and New Hampshire DES, Fish and Game and DRED.

EXHIBITS

A. Literature Cited