Application for Certificate of Site and Facility

SEACOAST RELIABILITY PROJECT

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New Hampshire Site Evaluation Committee

Docket No. 2015-04

Application of Public Service Company of New Hampshire
d/b/a Eversource Energy

for **Certificate of Site and Facility**

for the Construction of a New 115 kV Electrical Transmission Line
from Madbury Substation to Portsmouth Substation

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List of Acronyms

AAL	Annual average load
AC	Alternating current
ADSS	All-dielectric fiber optic cable
AHS	Archaeological and Historical Services, Inc.
AoT	Alteration of Terrain
APE	Areas of Potential Effect
ARM	Aquatic Resource Mitigation
ASCE	American Society of Civil Engineers
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	Best management practices
CGP	Construction General Permit
CL&P	Connecticut Light & Power
dBA	decibel A-weighted
d/b/a	doing business as
EFH	Essential Fish Habitat
ELF EMF	Extremely low frequency Electric and magnetic fields
EMF	Electric and magnetic fields
E&S controls	Erosion and sedimentation controls
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
G	Gauss
GIS	Geographical Information Systems
GSP	Gross state product
GRANIT	Geographically Referenced Analysis & Information Transfer System
HABS/HAER	Historic American Buildings Survey/Historic American Engineering Record
HDD	Horizontal directional drilling
HUC	Hydrologic Unit Code
HVED	High voltage, extruded dielectric
HVTL	High voltage transmission lines
Hz	Hertz
ICES	International Committee on Electromagnetic Safety
ICNIRP	International Council on Non-Ionizing Radiation Protection
IEEE	Institute of Electrical and Electronics Engineers

ISO-NE	Independent System Operator – New England
kV	Kilovolt
mG	milliGauss
MUTCD	Manual on Uniform Traffic Control Devices
MW	Megawatts
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NHCWS	New Hampshire Certified Wetland Scientists
NHDES	New Hampshire Department of Environmental Services
NHDHR	New Hampshire Division of Historic Resources
NHDOT	New Hampshire Department of Transportation
NHDRED	New Hampshire Department of Resources and Economic Development
NHF&G	New Hampshire Fish and Game
NHNHB	New Hampshire Natural Heritage Bureau
NHPUC	New Hampshire Public Utilities Commission
NHWAP	New Hampshire Wildlife Action Plan
NMFS	National Marine Fisheries Service
NPCC	Northeast Power Coordinating Council
NPDES	National Pollutant Discharge Elimination System
OH	Overhead
OHRV	Off highway recreation vehicle
OPGW	Optical ground wire
OSHA	Occupational Health and Safety Administration
PAF	Project Area Form
Pan Am	Pan Am Railways / Boston and Maine Railroad
PE	Polyethylene
PNGTS	Portland Natural Gas Transmission System
PPE	Personal protection equipment
PSNH	Public Service Company of New Hampshire d/b/a Eversource Energy
PVC	Polyvinyl chloride
PVP	Potential vernal pool
REMI	Regional Economic Models, Inc.
RFI	Request for Information
RMPP	New Hampshire Rivers Management and Protection Program
ROS	Recreation Opportunity Spectrum
ROW	Right-of-way

RPR	Request for Project Review
RTE	Rare, threatened, or endangered
SCENIHR	Scientific Committee on Emerging and Newly Identified Health Risks
SEC	Site Evaluation Committee
SRP	Seacoast Reliability Project
SSFATE	Suspended sediments dispersion model
SSVT	Station service voltage transformers
SWPPP	Stormwater Pollution Prevention Plan
SWQPA	New Hampshire Shoreland Water Quality Protection Act
UAM	Utility Accommodation Manual
UG	Underground
UNH	University of New Hampshire
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VA	Visual assessment
XLPE	Cross-linked polyethylene
WHO	World Health Organization

Executive Summary

Public Service Company of New Hampshire d/b/a Eversource Energy ("PSNH" or the "Applicant") submits this application to the New Hampshire Site Evaluation Committee ("SEC") for a Certificate of Site and Facility ("Certificate") to construct and operate the Seacoast Reliability Project—a new 115 kilovolt (kV) transmission line between the Madbury and Portsmouth substations ("SRP" or the "Project"). SRP will be approximately 12.9 miles long and include a combination of overhead ("OH"), underground ("UG"), and underwater components. It will travel within or along existing electric utility corridors,[1] which traverse portions of the towns of Madbury, Durham, Newington and the City of Portsmouth, including a submarine cable crossing from Durham to Newington under Little Bay. The Project will not change existing land uses within or along the corridor. Most of the Project route is within or along the edge of forested areas and does not require clearing outside the existing utility corridor.

This is a reliability project. The purpose of SRP is to provide an additional path to enhance the existing 115 kV transmission system between the Deerfield and Scobie Pond Substations along with 115 kV transmission ties to Maine in order to address reliability concerns in the New Hampshire Seacoast Region, which have previously been identified by the Independent System Operator of the New England electric system ("ISO-NE"). PSNH, working with ISO-NE, conducted an assessment of the New Hampshire and Vermont portion of the New England transmission system to determine whether the electrical infrastructure is sufficient to reliably deliver electricity under a wide range of system conditions. The study concluded that, for the New Hampshire Seacoast Region, additional transmission capacity is needed to support the reliable delivery of electric power to meet the Region's current demand and future increased demand.

SRP is an "energy facility" under RSA 162-H:2, VII(d) because it is "[a]n electric transmission line of a design rating in excess of 100 kilovolts that is in excess of 10 miles in length, over a route not already occupied by a transmission line." The corridor PSNH intends to use is currently occupied by a 34.5 kV distribution line for 12.1 miles, and transmission lines for 0.8 miles.[2] Accordingly, the Project requires a Certificate of Site and Facility.

Applicant Information

PSNH is a wholly-owned subsidiary of Eversource Energy (formerly Northeast Utilities), which engages in electric and gas delivery to businesses and residences throughout the northeast. Eversource Energy has extensive experience constructing and operating transmission lines. Eversource Energy operates New England's largest utility system, which serves more than 3.6 million electric and natural gas customers in Connecticut, Massachusetts, and New Hampshire. Eversource Energy owns and operates approximately 4,270 circuit miles of transmission lines,

[1] The Project corridor is defined as the combination of the existing PSNH owned utility easements, PSNH fee owned property, and any and all other land rights under current agreement/contract, licenses, or the PanAm railway right-of-way, and approvals to construct in public road rights of way, in which the Project facilities will be located.

[2] According to the New Hampshire Public Utilities Commission, power lines at or above 69 kV are considered transmission lines and lines less than 69 kV are considered to be distribution lines. *See* N.H. Public Utilities Commission, Order No. 23,443, at 24 (April 19, 2000) ("The line of demarcation between transmission and distribution is at the high side of the facilities that interconnect with facilities rated 69 kV and above and that step-down to facilities rated at or below 34.5 kV."); *see also* 107 FERC ¶ 61,246, Docket No. EL04-92-000 (June 2, 2004).

72,000 pole miles of distribution lines, 578 transmission and distribution stations, with nearly 450,000 distribution transformers.[3] Eversource Energy is currently enhancing the reliability of the electric grid with a number of significant construction projects involving high-voltage transmission lines in Connecticut, Massachusetts and New Hampshire. Eversource Energy's electric transmission investment over the next five years is projected to be approximately $4.3 billion.

Site Information

SRP will be constructed from the Madbury Substation to the Portsmouth Substation primarily through an existing electric utility corridor. Beginning at the Madbury Substation, the Project will travel south along the existing PanAm-owned railroad corridor along with an existing electric distribution line, until it reaches Route 4 in Durham. From Route 4, it will continue south along the railway, to the University of New Hampshire ("UNH") "A Lot" parking where the line will transition to an underground cable crossing Main Street and transition to an overhead line south of Main Street through the UNH campus toward the Packers Fall Substation. From the Packers Falls Substation, the line diverges from the railroad corridor and turns east towards Route 108, occupying an existing PSNH right-of-way ("ROW"). Once crossing Route 108, the line will continue east until transitioning to an underground / submarine cable inland from the westerly shore of Little Bay. After crossing under Little Bay, and traveling within a municipally owned road, the underground / submarine cable will transition to an overhead design on the eastern side of Little Bay Road. Continuing east through the existing ROW, the line will cross Fox Point Road and soon thereafter head south-easterly, paralleling the Spaulding Turnpike. The line will cross the Spaulding Turnpike and continue in an easterly direction on the southern side of the Crossings at Fox Run Mall until it reaches the Portsmouth Substation.

The Project will require that work be completed at each of the terminal substations including structural bracing modifications to the existing terminal structure and installation of new electrical equipment at Madbury Substation. A new terminal structure, control enclosure expansion, bus extension and electrical equipment additions are required at Portsmouth Substation. The work conducted at both substations will be constructed within the existing fence line of the facilities.

PSNH will be relocating and upgrading portions of the current distribution lines in the Project corridor in Newington and Durham onto public streets that are maintained by the towns, where there are existing distribution lines. These relocations and upgrades have been included in the Project design on either (1) a temporary basis, to allow construction of the new line in the right of way without disrupting local customer load; or (2) on a permanent basis, to reduce structure heights in the corridor in response to feedback from the towns, depending on the location.

The existing distribution lines from Route 108 (Newmarket Road) to Durham Point Road in Durham will be rebuilt along Durham Point Road and Longmarsh Road. The distribution line in Newington between Little Bay Road and Fox Point Road will be removed and re-built along public streets. The relocation and upgrade in Newington will be permanent and responds to feedback from Town officials and residents. With the distribution line relocated, lower structures will be used in the vicinity of the Newington Center Historic District. The relocation of the distribution lines does not fall under SEC jurisdiction because distribution lines are not considered an "energy facility" under

[3] PSNH is responsible for operating approximately 780 circuit miles of 115 kV, 8 miles of 230 kV and 252 miles of 345 kV transmission lines and about 204 active transmission and distribution substations.

RSA 162-H:2. To the extent any approvals are necessary for the permanent relocation of the distribution lines, PSNH will be working with the towns and appropriate agencies to obtain those approvals.

The Need for SRP

The Project is required to ensure a reliable transmission delivery system in the Seacoast Region. ISO-NE has concluded that additional transmission capacity is necessary in this area to support the reliable delivery of electric power. The capacity of the electric system in the Seacoast Region has been utilized to its fullest potential and is in immediate need of expansion in order to meet the Region's current and future electric demands.

SRP will strengthen system reliability by addressing specific thermal and voltage issues identified by ISO-NE in the Seacoast Region. For a copy of the Seacoast Region Transmission Map, please see Appendix 27.

The New England transmission network is the backbone of the electric system. It is a network of high-voltage lines that transmit bulk power generated by various resources connected to it to substations that convert the power to a lower voltage for delivery to homes and businesses. The grid is designed to meet all Federal Energy Regulatory Commission, Northeast Power Coordinating Council ("NPCC"), and ISO-NE reliability criteria. If the identified criteria violations are not addressed, transmission equipment could overload, line clearance above ground could sag to hazardous levels, or voltage levels could be outside of acceptable operating ranges under certain system conditions. The impacts could range from unsafe conditions to equipment damage to line and power outages.

ISO-NE considered a range of alternatives to increase transmission system thermal capacity, to increase transformer thermal capacity, and to improve system voltage performance, including: (1) New Gosling Road 345/115kV Substation suite of projects; (2) New Madbury to Portsmouth 115 kV suite of projects; (3) Dynamic voltage control devices at Ocean Road suite of projects; and (4) New Madbury to Brentwood 115 kV line suite of projects. Each of the presented alternatives was studied to address the design criteria needs identified by ISO-NE. Alternative (3) was eliminated as too costly and Alternative (4) was eliminated because it did not solve all identified needs.

After performing a detailed analysis of Alternatives (1) and (2), Alternative 2, the Madbury to Portsmouth suite of projects that includes SRP, "was selected as the preferred solution, as it is much less costly than the other alternative and addresses the needs in the area" that were previously identified by ISO-NE in the Needs Assessment.[4]

The Location of the Project and Alternatives Considered

Once ISO-NE selected the suite of projects that included SRP, PSNH identified potential routes for the new transmission line which resulted in the eventual development of the proposed route and northern and southern alternatives to the proposed route. The route evaluation criteria utilized to select the best route included, but was not limited to:

[4] *New Hampshire/Vermont Transmission Solutions Study Report*, ISO-NE, at 121 (April 2012) (contains Critical Energy Infrastructure Information and is not publically available).

- Maximizing the use of existing electric corridors;
- Minimizing the need to acquire land rights;
- Minimizing impacts to environmental resources;
- Meeting the Seacoast Region electrical reliability need without causing additional system or voltage problems elsewhere;
- Avoiding adverse impacts to system operability and future maintenance activities;
- Providing the most cost-effective solution; and
- Achieving the fastest practical in-service date.

PSNH initially identified three potential route alternatives, a Northern Alternative, Middle Alternative, and a Southern Alternative. Both the Northern Route and the Southern Route Alternatives were considered unavailable due to significant constructability, permitting, land rights, and costs issues. PSNH determined that the Middle Route Alternative was the only available route.

Once the route was identified, PSNH underwent a further analysis of route variations within the selected route. For a majority of the route, the selected route from Madbury substation south to Packers Falls Substation and east to Little Bay was the only option available to reach the western shore of Little Bay. For crossing Little Bay, any other crossing locations were eliminated, as they would have required the acquisition of new property rights and the creation of new utility ROW.

After selecting an underwater crossing for Little Bay, PSNH thoroughly analyzed three possible route variations in consultation with the Town of Newington. Numerous minor variations within each route were also examined. However, each variation presented numerous technical, environmental or other concerns, such as acquiring additional new property rights and crossing the Great Bay National Wildlife Refuge and Superfund site in the Pease Development Authority.

Following a thorough analysis, PSNH confirmed that the proposed route, which included limited underground / submarine construction, was consistent with the routing objectives and Good Utility Practice. The alternative routes presented by the Town of Newington and the detailed reasons why they were ultimately rejected after due consideration are thoroughly discussed in section 301.03(h)(2).

Project Design

Within the selected route, PSNH considered the possibility of siting segments of the Project underground in response to stakeholder input. In Durham, following numerous working sessions with the Town and University of New Hampshire ("UNH") officials, PSNH altered its proposed design to include an underground segment approximately 2,100 feet in length.

In response to the feedback from Town of Newington officials and residents, PSNH has altered the proposed structure types and will remove the existing distribution line that traverses the Newington Center Historic District in order to reduce the height of the new structures, which will address concerns raised with the initial design.

PSNH also offered to construct an additional approximately 2,600 feet of the Project underground and offered to adjust the location of a transition structure on the eastern side of Little Bay Road.

After numerous meetings with Town officials and the underlying property owners, PSNH was ultimately unable to secure all of the necessary underground rights from the town and landowners within the Town of Newington to make these requested design changes.

PSNH continues to work closely with the Town of Newington and abutting landowners to secure the necessary land rights to construct the Project underground in the Newington Center Historic District and in the Hannah Lane residential neighborhood. Should PSNH be able to obtain these rights and the necessary approvals,[5] PSNH will submit an amendment to its Application prior to the commencement of discovery in this proceeding.

After reviewing all of the alternatives and considering input from the local communities, PSNH concluded that, on balance, the proposed Project route was the best solution because it met the objectives of the evaluation objectives, is consistent with Good Utility Practice, and will result in the fewest impacts to communities and resources in the region, while ensuring increased reliability and improvements to the system in the most cost-effective manner. See Section 301.03 (h)(2) for a more detailed discussion of alternatives and PSNH's efforts to optimize the design of the Project.

In addition to reviewing the proposed route alternatives and potential underground segments, PSNH made numerous additional changes to the design of the Project to incorporate feedback from the host communities regarding the overhead design. For example, in Durham, PSNH presented several design variations and worked with the Town to reach a consensus. PSNH altered its design at specific road crossings to minimize structure heights and worked directly with abutters to select the preferred structure type. On the western side of Little Bay, PSNH worked with the underlying landowner to alter the location of the transition structure away from the edge of the Bay to a point further in land to reduce potential visual effects from the Bay. Section 301.03(h)(2) also includes a complete discussion of the efforts PSNH has undertaken to work with the host communities and to optimize the design of the Project in consultation with the Project's experts.

Public Involvement

PSNH made significant pre-filing efforts to inform officials, business leaders and residents in the host communities of the Project's benefits and potential effects. Pre-application open houses and public information sessions were noticed in local and statewide news media in Durham, NH (Strafford County) on April 22, 2015 and Newington, NH on April 23, 2015 (Rockingham County). During those sessions, representatives of PSNH provided an overview of the Project, answered questions posed by attendees and received comment from members of the public. Where concerns were expressed, the Applicant has followed-up with individual attendees to provide additional information and try to address the concerns. The Applicant has made over 115 contacts with stakeholders to discuss the Project. *See* Seacoast Reliability Project Outreach Summary, Appendix 36.

Since the pre-application public information sessions, PSNH has continued to work directly with the host municipalities, abutting property owners and other stakeholders to assess, avoid, minimize, and mitigate anticipated property-specific impacts to the extent possible. Numerous design changes have been made to the Project to respond to feedback from these stakeholders. PSNH remains

[5] The Frink Farm in Newington is currently subject to an agricultural conservation easement. To construct the Project underground, PSNH will also need to seek an amendment of this easement by obtaining the required approvals from the Town of Newington, the Rockingham Conservation District, the United States Department of Agriculture, and the New Hampshire Department of Justice.

committed to working with host municipalities and abutting property owners throughout the SEC process and during construction.

Potential Effects and Proposed Mitigation Measures

Visual Effects

The Visual Assessment ("VA") prepared for SRP concluded that the Project will not have an unreasonable adverse effect on aesthetics.

Before filing its application, PSNH held local meetings with each host community as well as numerous meetings with Durham and Newington municipal officials. PSNH also met and consulted with UNH representatives. As a result, PSNH incorporated, and is planning to incorporate, design elements that address common concerns about visibility including: the underground section through the Town of Durham; relocating the transition structure on the western shore of Little Bay; relocating distribution lines, where possible, in order to reduce transmission line structure heights, for example, by approximately 20 to 30 feet in the Town of Newington; and altering structure types and their locations at the request of abutting property owners.

In addition, the co-location of the Project within an existing electric corridor significantly reduces the visual effects associated with Project development as these areas are more densely settled and developed portions of New Hampshire. The use of the existing corridor will help to reduce the disruption to adjacent land uses and minimize the amount of new clearing required. The lack of highly sensitive areas coupled with the existing development patterns and targeted use of underground facilities, yields the result that the new transmission line has limited effect on aesthetic resources.

For an additional discussion on aesthetics, please see Section 301.05.

Historic Sites

PSNH is engaged in the National Historic Preservation Act Section 106 review process for historic and archeological resources in the Project area. The Project has consulted and will continue to consult with the New Hampshire Department of Historical Resources ("NHDHR") and with the United States Army Corps of Engineers ("USACE"), as the lead federal agency in this process.

PSNH has completed substantial surveys to identify archeological sites and above ground historic resources in the Project area. For above ground resources, PSNH has submitted a Project Area Form to NHDHR and it is completing individual and district area forms under NHDHR's and the USACE's Section 106 review to identify properties that are eligible for listing on the National Register of Historic Places. The Applicant has mapped and catalogued over 162 resources within the Project area. From that, the Project's expert consultant on above ground historical resources has concluded that the Project may result in an indirect (visual) adverse effect on three historical resources.

The Project was designed to avoid and minimize effects on historic resources where feasible. The Project changed the design near Main Street in Durham and on the UNH campus to place 2,100 feet of the line underground. The Project agreed to do the same in and around the Newington Center Historic District but, to date, PSNH has been unable to obtain all of the necessary land rights to

proceed with the underground option. In this location and other areas, the Project has altered structure heights, designs and locations to avoid or minimize effects on historic resources. Due to the Project's avoidance and minimization efforts, adverse effects to these resources from the Project will not be substantial.

For archeological resources, Phase I-A surveys were completed within the transmission corridor and for access roads. The Phase I-A survey has identified archeologically sensitive areas, previously recorded archeological sites, and cemeteries or graveyards. NHDHR has concurred in the Phase I-A recommendations for a Phase I-B survey in specific areas along the route. That work is underway now.

Although the full Section 106 process has not been completed, the Project's consultants have concluded that the Project will not have an unreasonable adverse effect on archeological and historic resources.

For an additional discussion on historic sites, please see Section 301.06.

Air, Water and Other Natural Resources

PSNH has studied the environmental resources within the Project area in detail and has consulted with the appropriate state and federal agencies. PSNH has designed the Project to avoid or minimize environmental impacts and has proposed measures to mitigate any potential negative effects.

Because the Project only involves the development of a new electric transmission line, it will not create any permanent air emissions sources or have an adverse impact on air quality. During construction, potential for short-term localized effects on air quality from fugitive dust and from vehicular emissions associated with operating construction equipment will be minimized by using wetting techniques and low sulfur fuel and limiting idling.

Impacts to water resources are almost entirely temporary. Direct fill impacts have been avoided where possible, which has resulted in a total of 0.14 acres of permanent fill in wetlands. These include 0.02 acres of permanent fill in freshwater wetlands; and potentially 0.12 acre in tidal wetlands (intertidal unconsolidated bottom) if protective cover is needed over the cables. Temporary impacts to freshwater wetlands primarily result from matting to access structure sites and to clear trees (6.98 acres). Approximately 6.27 acres of temporary estuarine wetland impacts result from burial of the three cables under Little Bay. Best management practices, such as timber mats for access roads and work pads in sensitive areas, will be used when necessary to minimize or eliminate, to the extent possible, temporary impacts. Indirect impacts will result from vegetation conversion (permanent tree removal) in the wetlands and will result in 7.30 acres of conversion. Permanent clearing of upland stream buffers on perennial and intermittent streams will result in an additional 2.00 acres of conversion.

PSNH has developed a compensatory mitigation plan in the event that installation of the cable results in limited, permanent wetland impacts. Any permanent wetland impacts are currently proposed to be mitigated through participation in the Aquatic Resource Mitigation Fund (i.e., in-lieu fee). Discussions with Durham and Newington are on-going to develop local mitigation proposals to substitute for in-lieu fee contribution for those towns. Projects under consideration include a potential habitat restoration at Wagon Hill Farm in Durham.

The Project will cross Little Bay by way of three submarine cables. The primary use of jet plow technology to install the three cables minimizes the overall disturbance to surface areas and benthic species. PSNH will install the cable during the fall which will help to reduce impacts to most fish and benthic organisms. The installation will result in temporary disturbances of approximately 6.27 acres of estuarine habitats. Impacts to water resources are almost entirely temporary. During the submarine cable installation process, PSNH may be required to use protective cover, such as concrete mattresses, which may result in permanent impacts.

Habitat assessment surveys were also conducted. Although narrow, the existing utility corridor provides some relatively valuable habitat resources for grassland/shrub land species, and may also provide a dispersal corridor for species that depend on grassy and/or shrubby habitats. While the Project will require some additional clearing in the corridor, the effect will be minimal with little significant loss to adjacent forested habitat. Shrub and grassland species will benefit from the additional clearing.

One state-listed rare plant, crested sedge, and four exemplary natural communities were found within the SRP. The corridor also contains habitat likely to be occasionally used by eight species of birds, reptiles and mammals, although none were found during Project surveys. Impacts to these species will be alleviated by a combination of avoidance and minimization, including time-of-year restrictions and habitat protection with timber mats. Temporary impacts to salt marsh will be restored.

For an additional discussion of the Project's impacts on the environment, please see section 301.07.

Public Health and Safety

PSNH will construct and operate the Project in accordance with all applicable safety and electrical codes, including the National Electrical Safety Code and PSNH transmission line design standards.

To assess the potential effect of the Project on extremely low frequency ("ELF") electric and magnetic fields ("EMF"), PSNH retained the services of Exponent, Inc., an engineering and scientific consulting firm, to prepare a summary of the current status of research on EMF and to model the existing and predicted electric and magnetic fields at the annual average and annual peak load conditions.

Over the past 35 years, researchers have examined whether ELF EMF from power frequency sources can cause short- or long-term health effects in humans and health risk assessments have from time to time been issued by expert panels organized by national and international scientific organizations. The World Health Organization ("WHO") published its comprehensive health risk assessment of ELF EMF in 2007 that critically reviewed the cumulative body of research through 2005. As the WHO website currently states "[b]ased on a recent in-depth review of the scientific literature, the WHO concluded that current evidence did not confirm the existence of any health consequences from exposure to low level electromagnetic fields."

In March 2015, the European Union's Scientific Committee on Emerging and Newly Identified Health Risks ("SCENIHR") issued its most recent review of health research on electromagnetic fields, including ELF EMF. Consistent with WHO's conclusion, the SCENIHR report did not

conclude that the available scientific evidence confirms the existence of any adverse health effects associated with ELF EMF exposure.

There will not be an increase in audible noise in the vicinity of the Project because audible noise and other associated effects of corona discharge are typically not noticeable at lower transmission operating voltages, such as that of this proposed 115 kV transmission line.

For additional discussion on the impacts of the Project on public health and safety, please see section 301.08 of the Application.

Orderly Development of the Region

Local Land Use

Land uses along the Project corridor include forestry, agriculture, residential, commercial/industrial, transportation, institutional/government, recreation areas, conservation, historical, and natural features such as rivers, wetlands, and forest lands, including wildlife habitat. The construction and operation of the Project will have little impact on local land use because the Project will be located along the existing established utility corridor. As the SEC has previously recognized,[6] siting a new transmission line along an already developed corridor is a sound planning and environmental principle because it reinforces local patterns of development and is consistent with local and regional land use planning. For additional information on land use, please see section 301.09(a).

Local Economy and Employment

Economic benefits to the local communities in the Project area will peak during construction. The Project will provide economic benefits locally and statewide by creating jobs, increasing economic output (sales), increasing gross state product ("GSP") as well as personal income during the construction phase between 2017 and 2018. These economic benefits include:

- Investment of approximately $77 million in local and State infrastructure improvements with approximately $17.4 million spent with local and State businesses and labor;
- Increases to the local and State tax base, including, within the first full year of operation, between $956,000 to $1.4 million to the four host communities, $157,000 to $173,000 to Strafford and Rockingham Counties, and $460,000 to $562,000 to the State for redistribution to local school districts;
- An increase in the State's economic output by approximately $28 million higher than it would be in the absence of the Project construction;
- An increase to the State's GSP by an estimated $18 million to $19 million higher than it would be in the absence of constructing the proposed Project;
- The creation of between 69 and 123 New Hampshire jobs during the peak year of construction;

[6] The SEC found that "the use of [an] existing right of way is much more consistent with the orderly development of the region and has less impact on the environment." Decision in Portland Natural Gas Transmission System Maritimes ("PNGTS") & Northeast Pipeline Company, SEC, Docket No. 96-01 and Docket No. 96-03, 1, 17 (July 16th, 1997). In addition, the SEC found that, in the context of sighting transmission projects, "the single most important fact bearing on this finding [that the facility will not unduly interfere with the orderly development of the region] is that the proposed transmission line occupies or follows existing utility transmission rights-of-way." Findings of the Bulk Power Facility Site Evaluation Committee, SEC DSF 850-155, 1, 11 (Sept. 16th, 1986).

- The creation of between 35 and 55 jobs annually, on average, during the construction period of the Project; and
- An increase to personal income in New Hampshire by a total of $9 million to $13 million cumulatively over the construction period.

For an additional discussion of the economic benefits of the Project, please see Section 301.09(b).

Construction and operation of the Project will not have a negative effect on tourism and recreation or on community services, facilities, and infrastructure in the region. The Project will be constructed within an existing ROW. There are no State parks, or campgrounds within or adjacent to the Project and the Project will not impact the use of hiking trails within the area.

Property Values

The Applicant engaged Chalmers & Associates, LLC ("Chalmers") to review published research and to develop New Hampshire-specific research on impacts to property values and real estate markets associated with high voltage transmission lines ("HVTL"). Chalmers concluded that the Project will not have a discernable effect on property values or marketing times in local or regional real estate markets. The results of the Chalmers research report are included in Section 301.09(b)(4) of the Application.

Public Interest

The Project will serve the public interest in New Hampshire by ensuring a reliable and adequate power supply to the Seacoast Region. SRP is a key piece among a suite of projects that are part of the "Seacoast Solution" identified by ISO-NE. SRP is needed to support the reliable delivery of electric power to meet the Region's current demand and support the Region's future economic growth. The Project will not have an unreasonable adverse effect on the natural environment, water quality or air quality. There will be no unreasonable adverse effects to historic sites, aesthetics, or to public health. Moreover, the Project will serve the public interest by increasing the reliability of the power supply in the region, providing an increase to the local and State tax base, and by creating job opportunities during the construction phase of the Project.

Conclusion

The Project is required to correct deficiencies identified in the 115 kV transmission system in the New Hampshire Seacoast Region by the ISO-NE planning process and is one of a suite of projects selected through the ISO process to address this need. The proposed construction is required to provide long-term electric system reliability and capacity to meet the growing demand in the Seacoast Region. Input was sought from a variety of interested stakeholders prior to finalizing the proposed Project route and design. The original Project has been modified to reflect such input consistent with Good Utility Practice.

These transmission improvements are needed immediately. As this Application demonstrates, this Project meets all the requirements for the issuance of a Certificate.

Site 301.03 Contents of Application.

(a) Each application for a certificate of site and facility for an energy facility shall be signed and sworn to by the person, or by an authorized executive officer of the corporation, company, association, or other organization making such application.

Certification by William J. Quinlan of Public Service Company of New Hampshire d/b/a Eversource Energy:

In accordance with RSA 162-H:8, I, William J. Quinlan, President and Chief Operating Officer of Public Service Company of New Hampshire d/b/a Eversource Energy, do hereby swear and affirm that the information contained in this Application is true and accurate to the best of my knowledge and belief. I also certify that, as the Applicant to the New Hampshire Site Evaluation Committee, Public Service Company of New Hampshire d/b/a Eversource Energy agrees to provide such information as the Committee shall require to carry out the purposes of RSA 162-H.

William J Quinlan

Name: William J. Quinlan
Title: President and Chief Operating Officer

Date: 4-7-16
State of ~~New Hampshire~~ Connecticut
County of ~~Hillsborough~~ Hartford

On this 7th day of April, 2016, personally appeared before me the above-named William J. Quinlan, President and COO of Public Service Company of New Hampshire d/b/a Eversource Energy and swore and affirmed that the information contained in this Application is true and accurate to the best of his/her knowledge and belief.

Elizabeth A Maldonado

~~Notary Public~~ Commissioner of the Superior Court
~~My commission expires on~~ _____

(b) Each application shall include the information contained in this paragraph, and in (c) through (h) below, as follows:

(1) The name of the applicant;

Public Service Company of New Hampshire d/b/a Eversource Energy

(2) The applicant's mailing address, telephone and fax numbers, and e-mail address;

Public Service Company of New Hampshire d/b/a Eversource Energy
780 North Commercial Street
Manchester, NH 03101
Attn: Christopher J. Allwarden, Senior Counsel
Tel. 603-634-2459
Fax 603-634-2438
christopher.allwarden@eversource.com

(3) The name and address of the applicant's parent company, association, or corporation, if the applicant is a subsidiary;

Eversource Energy
107 Selden Street
Berlin, CT 06037

(4) If the applicant is a corporation:

a. The state of incorporation;

State of New Hampshire

b. The corporation's principal place of business; and

Energy Park
780 North Commercial Street
Manchester, NH 03101

c. The names and addresses of the corporation's directors, officers, and stockholders;

The names and addresses of the principal directors and officers of Public Service Company of New Hampshire d/b/a Eversource Energy can be found in Appendix 6. Eversource Energy is the owner of 100% of the outstanding common stock of Public Service Company of New Hampshire.

(5) If the applicant is a limited liability company:

a. The state of the company's organization;

Not applicable.

b. The company's principal place of business; and

Not applicable.

c. The names and addresses of the company's members, managers, and officers;

Not applicable.

(6) If the applicant is an association, the names and addresses of the residences of the members of the association; and

Not applicable.

(7) Whether the applicant is or will be the owner or lessee of the proposed facility or has or will have some other legal or business relationship to the proposed facility, including a description of that relationship.

The proposed energy facility is a new, primarily overhead 115,000 volt (115 kV) alternating current (AC) electric power transmission line to be owned and operated by the Applicant, Public Service Company of New Hampshire d/b/a Eversource Energy ("PSNH"), running a total of approximately 12.9 miles from PSNH's Madbury Substation in Madbury, New Hampshire, through the Towns of Durham and Newington, New Hampshire, to PSNH's Portsmouth Substation in Portsmouth, New Hampshire. The proposed energy facility, referred to hereafter as the Seacoast Reliability Project ("SRP" or "Project") will also include new line terminal additions at each of these PSNH substations, which will also be owned and operated by PSNH. The work conducted at both substations will be constructed within the existing substation fence line.

PSNH presently has the rights to construct, operate and maintain the Project. From the Madbury Substation to the UNH campus, the Project traverses overhead for approximately 1.4 miles along existing PSNH property, which includes fee property and PSNH easements that are either owned or which PSNH has contracted to acquire. The Project will also be located in a portion of a Pan Am Railroad active railway corridor per a license agreement with the Railroad. The line will then transition to underground within the UNH campus, and passing under Main Street in Durham and continuing underground through the UNH campus for a total distance of 0.4 miles. PSNH has contracted with UNH to acquire new easement rights for this section.

The line will then transition back to overhead in existing ROW owned either in fee, or under permanent easements by PSNH for approximately 1.8 miles to the Packers Falls Substation. The line then turns east and runs approximately 3.9 miles to the westerly shoreline of the Little Bay portion of Great Bay in Durham, where it will transition to underground on property that PSNH has contracted to purchase.

After transitioning to underground, the line will continue via buried submarine cable under and across Little Bay and within a an existing designated cable corridor, a

distance of approximately 1.1 miles, to the easterly shoreline of Little Bay in Newington. The Applicant is seeking a license from the New Hampshire Public Utilities Commission ("NHPUC") for the legal right to cross the Little Bay in the previously designated cable corridor. See Appendix 19 NHPUC license application for the Little Bay crossing.

After crossing the Bay, the Project will make land fall on property where PSNH has a contract to purchase a new easement. The line will leave the ROW at Gundalow Landing Road and continue underground in the street. As part of this filing, the Applicant is seeking approval from the Committee to construct the portion of the Project in these roads. Such approvals would otherwise be obtained from the Town, but for the Project being subject to SEC jurisdiction. See Appendix 18.

The Project will travel underground in the Gundalow Landing Road and under Little Bay Road for approximately 0.3 miles to the transition structure where the Project will transition back to overhead on the east side of Little Bay Road. The Project will continue overhead for approximately 4.1 miles in an existing utility corridor owned either in fee or under permanent easements by PSNH to the Portsmouth Substation.

(c) Each application shall contain the following information with respect to the site of the proposed energy facility and alternative locations the applicant considers available for the proposed facility:

(1) The location and address of the site of the proposed facility;

The Project will be located in the Towns of Madbury, Durham and Newington as well as the City of Portsmouth, in Strafford and Rockingham Counties, New Hampshire. Please see Appendix 1, titled United States Geological Survey ("USGS") Project Overview Map.

The approximately 12.9 mile long project does not have a physical address as a whole. The Project begins at the existing PSNH Madbury Substation located at 7 Miles Lane, Madbury, New Hampshire, traverses through Durham, crosses Little Bay via submarine cable into Newington, and then continues east before terminating in Portsmouth at PSNH's Portsmouth Substation located at 280 Gosling Road, Portsmouth, New Hampshire.

(2) Site acreage, shown on an attached property map and located by scale on a U.S. Geological Survey or GIS map;

The Project will be constructed on approximately 152 acres, including 142 acres on land and 10 acres in Little Bay. Appendix 1 is a U.S. Geological Survey Map displaying the location of the Project and the site acreage. The Project acreage is defined as the area required to operate and maintain the Project after construction. The on land site acreage calculation includes the area within the corridor that will contain the new structures and be maintained for line clearance, the underground easement within the UNH campus and on each side of Little Bay, the underground portion located in public roadways, as well as the portion of the Madbury and

Portsmouth Substations that will require additional construction. Most of the corridor will be 100 feet wide, with exceptions in Durham, where the corridor narrows to as little as 50 feet. In Newington, in the Crossings at Fox Run where the existing ROW is 300 feet wide, the Project utilizes only 150 feet of the ROW to accommodate relocating several transmission structures.

(3) The location, shown on a map, of property lines, residences, industrial buildings, and other structures and improvements within the site, on abutting property with respect to the site, and within 100 feet of the site if such distance extends beyond the boundary of any abutting property;

The Environmental Maps, Appendix 2, depict property lines, residences, industrial buildings, and other structures and improvements within the site, on abutting properties, and within 100 feet of the site if such distance extends beyond the boundary of any abutting property. The Environmental Maps have a scale of 1 inch to 150 feet, and typically depict at least 300 feet on each side of the ROW. The Applicant is also seeking a partial waiver of this rule to the extent property lines, industrial buildings, and other structures and improvements extend beyond the mapped area as depicted on the Environmental Maps.

The geographic information system ("GIS") database used to create the Environmental Maps was prepared using information supplied by PSNH, USGS topographic information, recent aerial photography, and readily available public information, such as environmental and natural resource data. During this information search, a number of federal, state and local agency and academic electronic data bases, such as the UNH Geographically Referenced Analysis & Information Transfer System ("GRANIT") database were reviewed. Primary data depicted on the base map include, but are not limited to, an inventory of federal and state and local lands and jurisdictions, major roads and highways, existing transmission lines and substation infrastructure, lakes, reservoirs, rivers and other water bodies and wetlands.

(4) Identification of wetlands and surface waters of the state within the site, on abutting property with respect to the site, and within 100 feet of the site if such distance extends beyond the boundary of any abutting property, except if and to the extent such identification is not possible due to lack of access to the relevant property and lack of other sources of the information to be identified;

Please see the Existing Conditions Maps (Appendix 3), which identify all wetlands and surface waters within and adjacent to the Project. Within the SRP corridor, all jurisdictional wetland resources were ground delineated using the routine determination according to the criteria established by the USACE in the *1987 Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (2012). The jurisdictional wetland boundaries were located with GPS capable of sub-meter accuracy. The approximate limits of wetlands within 100 feet of the SRP corridor were estimated based on remote mapping resources, including aerial photographs and Project-specific contours. Beyond 100 feet and within abutting properties, the

wetlands were estimated using United States Fish and Wildlife Service ("USFWS") National Wetland Inventory data available on UNH's GRANIT database. The estimated wetlands are shown in different cover types on the Existing Conditions Maps to distinguish them from the jurisdictional, ground delineated wetland boundaries within the Project corridor. The Existing Conditions Maps depict the wetlands and surface on abutting properties, and within 100 feet of the site if such distance extends beyond the boundary of any abutting property, or within the limit of the mapped area. The Existing Conditions Maps are at a scale of 1 inch to 400 feet, and typically depict at least 1,000 feet on each side of the ROW. The Applicant is also seeking a partial waiver of this rule to the extent wetlands and surface waters extend beyond the mapped area as depicted on the Existing Conditions Maps.

The Project area is located in the Great Bay watershed (Hydrologic Unit Code ("HUC") 8) within four subbasins (HUC 12) and consists of approximately: 60 acres within the Oyster River watershed, 12 acres in the Lower Lamprey watershed, 29 acres in the Great Bay watershed (Durham and Newington), excluding the Little Bay footprint, and 41 acres in the Portsmouth Harbor watershed. See Watershed Map, Appendix 4). With the exception of Portsmouth Harbor, all lands within the corridor drain to Great Bay estuary; Portsmouth Harbor drains to the Piscataqua River. Major drainages include the Oyster River and La Roche Brook in Durham, and Knights and Pickering Brooks in Newington. The perennial, intermittent and ephemeral streams identified during water resource delineations within the Project corridor are minor tributaries to the larger brooks and streams listed above.

Water resource delineations were performed in 2013, 2014 and 2015, and followed guidelines and methodologies recommended by the New Hampshire Department of Environmental Services ("NHDES") and U.S. Army Corps of Engineers ("USACE"). PSNH retained Normandeau Associates Inc. (Normandeau) to delineate wetlands, streams, vernal pools and marine resources in the vicinity of the Project corridor and cable area. New Hampshire-certified wetland scientists either performed the delineations or reviewed the work performed by other staff.

The majority of the streams identified within the SRP corridor are perennial or intermittent (80%), which is consistent with the flat topography and low elevation of the site (Figure 4). The study area contained 18 perennial streams; the largest being the Oyster River, which is a designated river under the New Hampshire Rivers Management and Protection Program ("RMPP")(RSA 483). As a designated river, the Oyster River is subject to the protections afforded by the NH Shoreland Water Quality Protection Act ("SWQPA"). The SRP corridor passes through a small portion of the Lamprey River Watershed in Durham, which is also a designated river; however the Project does not cross any of the six river segments or tributaries cited in the Lamprey River designation description. The only other water resource protected under the SWQPA is Little Bay, which the Project will cross in a mapped cable area via three submarine cables.

A total of 114 wetlands were identified in the Project area, Appendix 3. Approximately 70 percent of the delineated wetlands were freshwater, palustrine

systems, while the remaining 30 percent were estuarine wetland and deepwater habitats associated with the Little Bay cable crossing. Due to the routine vegetation maintenance activities associated with the existing electric line, the majority of the freshwater wetlands were a combination of palustrine emergent and scrub-shrub systems (49%) or palustrine emergent (17%) wetlands. The remaining freshwater wetlands were different combinations of emergent, scrub-shrub, forested and unconsolidated bottom. Many of the wetlands were parts of larger wetland systems adjacent to the corridor, and many were disturbed to some extent due to adjacent or nearby development and other ongoing activities. Five of the wetlands are associated with three prime wetlands mapped in the Town of Newington.

The majority of the estuarine wetlands consisted of intertidal mudflat and subtidal unconsolidated sands and silt associated with Little Bay in Durham and Newington. Other estuarine wetlands include fringing salt marsh and rocky shore bordering the east and west shores of the bay.

In the freshwater wetlands, the most common principal functions and values identified across the study area include groundwater recharge/discharge, wildlife habitat, export of primary production, sediment/toxicant retention, and floodflow alteration. The estuarine wetlands provide principal functions of shoreline protection, wildlife habitat, fish and shellfish habitat and export of primary production.

Vernal pool surveys were conducted in April and May, the typical window for identifying vernal pool indicators in the coastal plain of New Hampshire. For wetland and stream delineations conducted outside of the vernal pool season, potential vernal pools were identified, with a follow-up survey conducted in the springs of 2014 and 2015 to verify whether vernal pool indicator species were present. Based on the spring surveys, no vernal pools were found to occur within the SRP corridor. One pond in Newington, associated with wetland NW4 contained singing wood frogs in spring 2015, however, observations in 2013, 2014 and 2015 suggest that the deeper portion of this pond is permanently flooded year-round in most years. The permanent hydroperiod does not meet the definition of a vernal pool.

Wetlands and surface waters within or adjacent to the Project are described in further detail in the *Natural Resource Existing Conditions Report*, Appendix 7 as well as the application forms, design plans, and maps provided in support of the NHDES Wetlands Permit Application, NHDES Shoreland Permit Application, and NHDES § 401 Water Quality Certification Request, referenced in Section 301.03(d) of this Application. These documents are included in Appendices 13 through 15.

(5) Identification of natural, historic, cultural, and other resources at or within the site, on abutting property with respect to the site, and within 100 feet of the site if such distance extends beyond the boundary of any abutting property, except if and to the extent such identification is not possible due to lack of access to the relevant property and lack of other sources of the information to be identified;

The Existing Conditions Maps depict natural, historic, cultural, and other resources at or within the site, on abutting properties, and within 100 feet of the site if such distance extends beyond the boundary of any abutting property. The Existing Conditions Maps have a scale of 1 inch to 400 feet, and typically depict at least 1,000 feet on each side of the ROW. The Applicant is also seeking a partial waiver of this rule to the extent natural, historic, and cultural resources extend beyond the mapped area as depicted on the Environmental Maps.

a. Natural Resources

In addition to the wetland resources described in Section 301.07 (c)(4), the Project corridor crosses through a diverse assemblage of land uses and habitat types. These include relatively rural and undeveloped areas in Madbury and Durham, densely developed areas associated with the UNH campus and commercial lands to the east of the Spaulding Turnpike in Newington and Portsmouth, and several lower and moderate density residential areas to the east and west of Little Bay. Several active farms lie within or adjacent to the corridor, with fields of hay and pasture. The topography is generally flat to rolling, which is consistent with the Coastal Plain of eastern New Hampshire.

The SRP corridor crosses though some areas designated as Highest Priority Habitat by the NH Wildlife Action Plan. See Map 4 in Appendix 7. The remainder of the corridor passes primarily though areas that are designated as Supporting Landscapes or that have no designation at all. The relative proportion of these habitat types in the corridor reflects their wider distribution in the surrounding landscape.

1. Little Bay

In Little Bay, the tidal flats in and adjacent to the cable corridor are mapped by New Hampshire Fish and Game Department ("NHF&G") as Shellfish Habitat, with softshell clams and razor clams being the dominant harvestable mollusk species, although pockets of oysters are present. Commercial lobstering and recreational fishing, lobstering and shellfishing occur throughout the Great Bay Estuary, although the charted Cable Area is permanently closed to harvest. In 2014, NHF&G issued 200 licenses for recreational oyster harvesting, not including the undetermined number of seniors who are not required to purchase a license. At the time of the Application, ten oyster aquaculture facilities operate in upper Little Bay on sites designated by the State although NHDES and NHF&G have been receiving several new applications each year so the number of facilities may change before Project construction. One of these facilities is located

partially within the charted Cable Area, approximately 500 feet north of the new cable installation. The facility's owner is working with NHDES to resolve the location because the Cable Area is closed to shellfishing. The remaining area oyster farms are located further north of the Project, with the next closest lying approximately 0.5 miles to the north.

2. Rare, Threatened, or Endangered Species and Exemplary Natural Communities

Consultation with the NH Natural Heritage Bureau ("NHNHB"), USFWS, and National Marine Fisheries Service ("NMFS") indicated that a number of rare plants and animals occur in the vicinity of the Project. Field surveys found one state-Endangered plant species, crested sedge, in four patches within the same general location in the Project corridor (shown on Confidential Maps in the *Rare, Threatened and Endangered Species and Exemplary Natural Communities Report* only). [7] Four exemplary natural communities, High salt marsh, Salt marsh system, Sparsely vegetated intertidal system and Subtidal system, were identified within the Project area in Little Bay.

The ringed boghaunter, a state-Endangered dragonfly, occurs in a sedge meadow near the SRP corridor. Some marginally suitable habitat for this species was identified within the corridor during a field survey, but no exuvia were observed.

Two federally listed fish species, shortnose sturgeon (Endangered) and Atlantic sturgeon (Threatened), may use the Little Bay corridor as feeding habitat. Neither species is known to breed in NH, and shortnose sturgeon is considered locally extinct, although adults from other populations in the Gulf of Maine could occasionally feed in the Great Bay Estuary, including within the Project area. Three state-listed fish species, American eel, swamp darter and banded sunfish, all state Special Concern species, are known to occur upstream and downstream of several streams crossing the SRP corridor, including the Oyster River. These species are assumed to periodically occur within the corridor.

Several listed reptiles, including northern black racer (state Threatened), Blanding's turtle (state Endangered) and spotted turtle (state Threatened) , are likely to occur in the Project area based on their relatively large home ranges and utilization of a variety of habitats, including those found in the project corridor.

[7] The Original Confidential RTE map accompanying the original Application depict these rare, threatened and endangered species. However, pursuant to the New Hampshire Native Protection Act, RSA Chapter 217-A:2, the location of these resources has been redacted for all other copies of the Application and the Applicant has concurrently submitted a Motion for Protective Order and Confidential Treatment of this information.

American bald eagles (state Threatened) and osprey (state Special Concern) are known to occur on the Great Bay estuary. Bald eagles both nest and overwinter on the Bay. Osprey nest on the Bay, but migrate south for the winter. No nests were identified in the vicinity of the Project corridor to date, and another survey will be conducted prior to the start of the construction period for the Project.

Two mammals, northern long-eared bat (recently listed as federally and state Threatened) and New England cottontail (state Endangered) have habitat potential within the Project area. A comprehensive assessment of the northern long-eared bat within the Project area has not been conducted but given its known distribution in the Seacoast Region and habitat preferences, these bats are assumed to be present in the Project area. As a result of the decimation of cave-hibernating bats from the spread of white-nosed syndrome throughout the Northeast, numbers of northern long-eared bats within the Project area are expected to be low. While the New England cottontail does not currently occupy habitat in the Project area, several locations along the Project corridor in Durham are being actively managed to support New England cottontail in the future, including UNH's Foss Farm and NH Fish and Game's La Roche Brook parcel.

b. Cultural and Historic Resources

1. Archeological Resources

The Project conducted a Phase I-A survey within the Project corridor and for access roads. The Phase I-A survey identified known sites and sensitive archaeological areas that will be further investigated through a Phase I-B survey. The sensitive areas identified as part of the Phase I-A include:

- None (0) in Madbury;
- Twenty-two (22) in Durham, which include two (2) recorded sites and one (1) cemetery;
- Eight (8) in Newington, which includes one (1) cemetery; and
- None (0) in Portsmouth.

Subsequent to and separate from the Phase I-A report, the Project completed an archeological desk review of abutting properties on each side of the corridor to identify the presence of any known archeological sites on abutting properties and within 100 feet of the site if such distance extended beyond the boundary of the abutting property. The desk review entailed review of prior archeological reports, Project aerials and historic maps. NHDHR) also provided data regarding the location of known archeological sites on abutting properties as recorded in the NHDHR State-Wide Site Inventory Files. Nine previously recorded archeological sites were identified on abutting properties, and two other sites are located within the corridor and may extend beyond the corridor onto abutting property. These results are reported in the confidential *Desk Review of*

Archeological Sites on Abutting Properties dated February 2016 and found at Appendix 8. Please see the Phase I-A Preliminary Archaeological Survey, and Addenda, (Appendix 9) and Section 301.06 of the Application for a further discussion of the archaeological resources within the Project area.

2. Historic (Above Ground) Resources

The Applicant has prepared and included in this application two reports identifying potentially-affected historic above ground resources: the *Project Area Form* (January and April 2016 and the *Seacoast Reliability Project Preliminary Report: Historic Resources* (February 2015). They identify all historic sites in the Area of Potential Effect (APE).[8] As noted below in Section 301.06, there are some 162 properties or areas/districts that meet the 50 year age-eligibility criterion for listing on the National Register of Historic Places ("National Register"). A full identification of historic resources is found at Section 301.06 of this Application and in the NHDHR Project Area Form ("PAF") (Appendix 10).

(6) Evidence that the applicant has a current right, an option, or other legal basis to acquire the right, to construct, operate, and maintain the facility on, over, or under the site, in the form of:

Please see section 301.03 (b)(7) for a description of whether the Applicant will be the owner or lessee of the proposed facility or has or will have some other legal or business relationship to the proposed facility. Please also see the Pre-Filed Testimony of James Jiottis for additional evidence that PSNH has a current right, an option, or other legal basis to acquire the right to construct, operate, and maintain the facility.

a. Ownership, ground lease, easement, or other contractual right or interest;

b. A license, permit, easement, or other permission from a federal, state, or local government agency, or an application for such a license, permit, easement, or other permission from a state governmental agency that is included with the application; or

c. The simultaneous filing of a federal regulatory proceeding or taking of other action that would, if successful, provide the applicant with a right of eminent domain to acquire control of the site for the purpose of constructing, operating, and maintaining the facility thereon; and

[8] The indirect visual APE consists of the transmission corridor and a one-half mile area on either side of the corridor.

(7) Evidence that the applicant has a current or conditional right of access to private property within the boundaries of the proposed energy facility site sufficient to accommodate a site visit by the committee, which private property, with respect to energy transmission pipelines under the jurisdiction of the Federal Energy Regulatory Commission, may be limited to the proposed locations of all above-ground structures and a representative sample of the proposed locations of underground structures or facilities.

The Project is located along numerous public roads and in public places where the Committee and any other member of the public has the right to access or view the Project's proposed location in a sufficient manner so as to accommodate a site visit. Members of the Committee are able to see the ROW, therefore, for this Project, there is not any specific need to access private property. Please also see the Pre-Filed Testimony of James Jiottis.

(d) Each application shall include information about other required applications and permits as follows:

(1) Identification of all other federal and state government agencies having permitting or other regulatory authority, under federal or state law, to regulate any aspect of the construction or operation of the proposed energy facility;

RSA 162-H:7, IV provides that "[e]ach application shall contain sufficient information to satisfy the application requirements of each state agency having jurisdiction, under state or federal law, to regulate any aspect of the construction or operation of the proposed facility, and shall include each agency's completed application forms."[9] The statute thus requires an Applicant to submit information that satisfies the application requirements of the "state agencies having permitting or other regulatory authority."[10] The Applicant acknowledges that under Site 301.03(d) the SEC may require the filing of additional information relative to other agencies and other aspects of regulation and regulatory compliance under its rulemaking authority. However, as discussed below, the Applicant submits that the statute limits the agencies that may make agency-specific completeness determinations to those state agencies that make final decisions.

Pursuant to the statute, each state agency having permitting or other such regulatory authority must determine if an Application contains "sufficient information for its purposes" to make a final decision.[11] Accordingly, the Applicant believes that only those state agencies that make a final decision by issuing a permit, order or decision within the time limits established in RSA 162-H:7, IV-c, may participate in making a completeness determination under the statute. Those state agencies include NHDES, NHPUC, and New Hampshire Department of Transportation ("NHDOT").

[9] RSA 162-H:7, IV.
[10] *Id.*
[11] *Id.*

An agency's purpose under the statute must be read in the context of its other requirements under the statute, namely, those that require an agency having permitting or other regulatory authority to report its progress to the SEC within 150 days and to make a final decision within 240 days.[12] This position is consistent with the fundamental goal of resolving all issues in an integrated fashion, as set forth in RSA 162-H:1. Moreover, the statute recognizes that agencies having permitting or other such regulatory authority over a project comprise only those agencies that may dictate terms and conditions in a permit or decision, or deny a necessary approval altogether.[13]

The Applicant's view is further reinforced by the recent amendments to RSA 162-H, specifically, the addition of RSA 162-H:7-a, which recognizes the two basic ways in which state agencies may participate in SEC proceedings, i.e., as an agency that makes a final decision, or as an agency that takes a position on how the SEC should make a particular finding.

a. Federal Agencies

- US Army Corps of Engineers (USACE) (Clean Water Act, 33 U.S.C. § 1344 *et. seq.*, relative to wetland protection as addressed through the New Hampshire Programmatic General Permit; Rivers and Harbors Appropriation Act of 1899, 33 U.S.C. § 403 *et seq.*; and National Historic Preservation Act, 16 U.S.C. § 470);
- US Environmental Protection Agency (USEPA) (Clean Water Act, 33 U.S.C. § 1251 *et. seq.*, relative to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit);
- Federal Aviation Administration (FAA) (14 C.F.R. § 77.9 relative to the preservation of navigable airspace, an air obstruction determination under FAA Regulation Part 77.9(b) is required);[14]
- US Fish and Wildlife Service (USFWS) (Endangered Species Act of 1973, 16 U.S.C. § 1531, *et. seq.*, relative to protection of federally-listed threatened and endangered species as addressed under the New Hampshire Programmatic General Permit);[15] and
- National Marine Fisheries Service (NMFS) (Endangered Species Act of 1973, 16 U.S.C. § 1531, *et. seq.*, relative to protection of federally-listed threatened and endangered species; and Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1801, *et. seq.*, to promote conservation of marine fishery resources).

[12] RSA 162-H:7, VI-b and VI-c.
[13] RSA 162-H:16, I.
[14] The Applicant will submit FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the FAA at least 45 days before commencing construction.
[15] The USFWS results letter is included in Appendix 37 Rare, Threatened and Endangered Species and Exemplary Natural Communities Report

b. State Agencies

1. State Agencies That Make An Agency Completeness Determination

- NH Department of Environmental Services (NHDES), Water Division, Wetlands Bureau (RSA Ch. 482-A, relative to dredge and fill in wetlands as addressed under the NHDES Wetlands Permit Application);
- NHDES, Water Division, Alteration of Terrain (AoT) Bureau (RSA 485-A:17, relative to surface water runoff from land disturbance as addressed under the NHDES Alteration of Terrain Permit Application);
- NHDES, Water Division, Watershed Management Bureau (Clean Water Act, 33 U.S.C. § 1341 *et. seq.*, related to state certification that the USACE permit complies with state water quality standards (see Application for Water Quality Certification in Appendix 14);
- NHDES, Water Division, Wetlands Bureau, Shoreland Program (RSA Ch. 483-B, the Shoreland Water Quality Protection Act, establishes standards for development adjacent to the state's public water bodies as addressed under the NHDES Shoreland Permit Application);
- NH Department of Transportation (NHDOT) (RSA Ch. 236, 231 and 265 relative to regulation of the highway system, requires permits for utility crossings and use of NHDOT ROWs, including a Use and Occupancy Agreement, excavation (trench) permit, transportation of oversized loads, Turnpike Encroachment Agreement, and driveway permits); and
- NH Public Utilities Commission (NHPUC) (jurisdiction relative to crossings of public waters and lands under RSA 371:17 as addressed under the two NHPUC License Applications).

2. Other State Agencies

- NH Division of Historical Resources (NHDHR) (National Historic Preservation Act, 16 U.S.C. § 470 and RSA Ch. 227-C regarding cultural resource protection as addressed under the USACE's New Hampshire Programmatic General Permit);[16]
- NH Natural Heritage Bureau (NHNHB) (authority under RSA Ch. 217-A, the NH Native Plant Protection Act, to review impacts to state-listed rare, threatened, and endangered plant species as addressed under the NHDES Wetlands Permit Application);[17]
- NH Fish & Game Department (NHF&G) (authority under RSA Ch. 212-A, the NH Endangered Species Conservation Act, to review

[16] The NH Division of Historical Resources Request for Project Review and correspondence with NH Division of Historical Resources is documented in Appendix 33.

[17] NH Natural Heritage Bureaus data check results letter and correspondence with NH Natural Heritage Bureau is included in Appendix 37.

impacts to state-listed rare, threatened, and endangered wildlife species as addressed under the NHDES Wetlands Permit Application); and

- NH Department of Safety, Division of Fire Safety, State Fire Marshal (RSA Ch. 21-P:12 relative to the responsibilities of the State Fire Marshal, ensuring compliance with the NH State Fire Code and the NH State Building Code through the review of plans prior to construction).[18]

(2) Documentation that demonstrates compliance with the application requirements of all such agencies;

Documentation demonstrating compliance with the application requirements of the State and federal regulatory agencies listed in (d)(1) above has been included within the agency application forms and supporting documentation contained in the Appendices listed in the following Section (d)(3).

Applications for certain construction related approvals from State and federal agencies will be filed by contractors after: (1) the SEC site certificate and other approvals listed above are issued; (2) equipment is ordered; and (3) field work is ready to begin. These may include, if necessary:

- NHDOT Special Permit to move a load in excess of legal limit;
- NHDOT Driveway / Curb Certification;
- New Hampshire Department of Resources and Economic Development (NHDRED) Notice of Intent to Cut;
- NPDES Construction General Permit;
- NHDES approval of marshalling yards, laydown areas, and access roads;
- FAA Form 7460-1, Notice of Proposed Construction or Alteration;
- Blasting Permits; and
- United States Coast Guard Notice to Mariners.

(3) A copy of the completed application form for each such agency; and

Appendix 13: Joint NHDES/USACE Wetlands Permit Application

Appendix 14: NHDES Section 401 Water Quality Certification Request

Appendix 15: NHDES Shoreland Permit Application

Appendix 16: NHDES Alteration of Terrain Permit Application

Appendix 17: NH Department of Transportation Applications

[18] The State Fire Marshal within the NH Department of Safety, Division of Fire Safety, was consulted and will not be participating in the Site Evaluation Committee Process. See Appendix 12 for documentation of consultation with the State Fire Marshal's office.

- Use and Occupancy Agreement(s)
- Aerial utility permit application(s)
- Excavation (trench) permit application(s)
- Turnpike encroachment agreement application(s)

Appendix 18: Request for the Site Evaluation Committee to Grant Approvals for Overhead Municipal Road Crossings and to Excavate in Municipal Roads

Appendix 19: NHPUC Water and Public Land Crossing License Applications

- Construct and Maintain Electric Lines, Neutral Wires and Fiber Optic Cable Over and Across The Oyster River and Pickering Brook and under Little Bay in the Towns of Durham and Newington, New Hampshire
- Construct and Maintain Electric Lines, Neutral Wire and Fiber Optic Cable at Three Locations Over and Across Public Lands Owned by the State of New Hampshire in the Town of Durham, New Hampshire

(4) Identification of any requests for waivers from the information requirements of any state agency or department having permitting or other regulatory authority whether or not such agency or department is represented on the committee.

The Applicant is requesting waivers from Alteration of Terrain Rule Env-Wq 1504.09 that specify the requirements to prepare a Stormwater Drainage Report, Drainage Area Plans and Hydrologic Soil Group Plans in support of an Alteration of Terrain Permit Application.[19]

The Applicant is also seeking partial waivers from SEC rule Site 301.03(c)(3)–(5) and Site 301.08(c)(2).

(e) Requirements for an energy facility, including an energy transmission pipeline, that is not an electric generating facility or an electric transmission line.

The Project is an electric transmission line; therefore, this section does not apply.

(f) If the application is for an electric generating facility, the application shall include the following information.

The Project is not an electric generating facility that is either a bulk power facility or a renewable energy facility; therefore, this section does not apply.

(g) If the application is for an electric transmission line or an electric generating facility with an associated electric transmission or distribution line, the application shall include the following information:

[19] For additional information on the waiver request, please see NHDES Alteration of Terrain Permit Application, Appendix 16.

(1) Location shown on U.S. Geological Survey Map;

See Appendix 1, which displays the project on a U.S. Geological Survey map.

(2) A map showing the entire electric transmission or distribution line project, including the height and location of each pole or tower, the distance between each pole or tower, and the location of each substation, switchyard, converter station, and other ancillary facilities associated with the project;

See Engineering Design Drawings, Appendix 5, which displays the entire electric transmission line, including the height and location of each pole or tower, the distance between each pole or tower, and location of each substation and ancillary facilities.

(3) Corridor width for:

a. New route; or

The proposed Project is approximately 12.9 miles long; approximately 12.1 miles will be sited in or adjacent to an existing utility corridor that does not currently contain a transmission line. The remaining 0.8 miles will be sited in an existing utility corridor that contains transmission lines with a voltage rating in excess of 100 kV.

1. Madbury Substation to NH Route 4: Structures 1 to 10

The transmission line portion of the Project, to be designated within the PSNH system as Line F107, is approximately 12.9 miles in length and includes 150 new overhead structures. Beginning at the Madbury Substation, new structures 1 to 3 are located on PSNH fee-owned property. PSNH has obtained additional easements and fee property and contracted to acquire new easements to expand the existing ROW width from structures 4 to 10 to a new width of approximately 75 feet from the edge of the Railroad corridor. The length of this segment is 0.5 miles.

Tree clearing will be required along the new corridor edge in this section. The cleared width will be widened to 45 feet westerly from the centerline of the proposed line. See SRP Environmental Maps in Appendix 2. Clearing will involve selective mowing and removal of mature trees. As clearing is completed, trees at the edge of the corridor will be pruned to remove tree branches that extend into the ROW. Removal of danger trees outside of the corridor will take place where easement rights or landowner permissions allow. Clearing methods will be consistent with PSNH vegetation management guidelines and practices. This general language and reference to Environmental Maps applies to all tree clearing sections detailed below.

2. NH Route 4 to University of New Hampshire: Structures 10 to 23

The Project will then traverse within the Pan Am Railroad corridor for 0.9 miles. PSNH has contracted to obtain additional easement rights from

UNH to provide additional line clearances and improved access for this segment. See SRP Environmental Maps in Appendix 2. There will be tree removal and pruning within the expanded corridor extending to approximately 25 feet beyond the westerly edge of the Pan Am Railroad corridor. The utility license width in the corridor is approximately 60 feet in this segment.

3. University of New Hampshire: Underground Cable

The Project leaves the Pan Am Railroad corridor on to UNH property to a transition structure located on UNH property adjacent to the Pan Am Railroad corridor where it transitions from overhead to underground. The Project then continues underground for 0.4 miles, crossing under Main Street in Durham to south of Main Street on UNH property adjacent to the Pan Am Railroad corridor. Tree removal and pruning will be needed in some areas of this segment. Clearing will not exceed 50 feet in width.

4. University of New Hampshire to Durham Substation: Structures 24 to 33

The Project rises overhead within the existing PSNH ROW on UNH property for 0.7 miles to Durham Substation. The ROW ranges from 80 to 130 feet wide in this section. The maintained cleared width is typically around 60 feet and is located in the center of the ROW. To accommodate the new line, clearing needs to be extended to 50 feet on each side of the line, except on the eastern edge by the Pan Am Railroad corridor, where PSNH's ROW is limited. At this location clearing will extend approximately 20 feet beyond both edges of the current cleared width within the ROW. See SRP Environmental Maps in Appendix 2.

5. Durham Substation to Little Bay Crossing: Structures 33 to 101

From Durham Substation, the Project extends 5.1 miles to the transition structure near the westerly shore of Little Bay. The ROW is 100 feet wide in these sections. The maintained cleared width is approximately 60 feet. The ROW needs to be cleared to its full width of 100 feet to accommodate the new transmission line. Clearing will extend for approximately 20 feet beyond both edges of the current cleared width. See SRP Environmental Maps in Appendix 2.

6. Little Bay Crossing to Little Bay Road: Submarine and Underground Cable

From the transition structure within the existing ROW near the westerly shore of Little Bay, the Project will continue underground to Little Bay, underwater across Little Bay, and underground from Little Bay to a transition structure on the easterly side of Little Bay Road. The underwater segment is in a charted Cable Area (NOAA Chart No. 13285) that is approximately 1,000 feet wide and is 1.1 miles long.

The underwater portion across Little Bay terminates at a man-hole. The underground cable from the man-hole to the transition structure east of Little Bay Road is 0.3 miles in length.

Some tree clearing is necessary from the cable landing man-hole at the easterly shore of Little Bay to Gundalow Landing. Clearing will be confined to the PSNH easement and not exceed 50 feet in width.

7. Little Bay Road to Spaulding Turnpike: Structure 102 to 128

This overhead section is 2.3 miles long and the ROW is 100 feet wide. The maintained cleared width is approximately 60 feet. The ROW will be cleared approximately 20 feet on both edges from the current cleared width of 60 feet to the full 100 foot width. See Environmental Maps in Appendix 2.

8. Spaulding Turnpike to Spaulding Turnpike Crossing: Structures 128 to 137

This section is 0.6 miles long. The ROW width remains 100 feet where the proposed transmission line parallels the Spaulding Turnpike. It is also adjacent to a 30-foot corridor for a natural gas line and water main. The ROW needs to be cleared to its full 100 foot width to accommodate the Project. There is very limited tree clearing required in this section. See Environmental Maps in Appendix 2.

9. Spaulding Turnpike Crossing to Existing E194 Transmission Line: Structures 137 to 140

This section is 0.3 miles long and the ROW is 300 feet wide. There will be some tree clearing required in the vicinity of the Spaulding Turnpike. Most of this area is a parking lot for the Crossings at Fox Run. See SRP Environmental Maps in Appendix 2.

b. Widening along existing route;

As noted above, the existing route comprises 0.8 miles of the Project. This segment travels through parts of Newington and Portsmouth through a corridor that currently contains two 115 kV transmission lines and one 345 kV transmission line.

1. E194 Transmission Line to Newington Generation Station: Structures 140 to 147

This section is 0.5 miles long and the ROW corridor is 300 feet wide. Some tree clearing is required at the edge of the existing PSNH corridor; however, most of this area is a parking lot for the Crossings at Fox Run shopping center and other commercial properties. See Environmental Maps in Appendix 2.

2. Newington Generating Station to Portsmouth Substation: Structures 147 to 151

This section is 0.3 miles long and the ROW corridor is located on PSNH fee-owned property that currently contains several other transmission lines. The currently maintained cleared area will be widened up to 75 feet depending on the location of the new structures. See Environmental Maps in Appendix 2.

(4) Length of line;

The Project will be approximately 12.9 miles in length. Specific ROW segment lengths are included above. The Project will also include a relocation of a section of the E-194 Line for approximately half of a mile in Newington. For more specific information regarding the proposed transmission line please see Section 301.03 (h)(1).

(5) Distance along new route;

The distance along the new transmission route will be 12.1 miles. From Madbury Substation to structure 140, the Project will be constructed primarily within an existing PSNH electric distribution corridor and two new segments of underground ROW, namely one segment approximately 2,100 feet in length at UNH, and another approximately 1,470 feet in Newington. This section of the utility corridor does not contain and has never contained a transmission line.

Approximately twelve (12.1) miles of the existing corridor is currently occupied by 34.5 kV distribution circuits that are owned and operated by PSNH. Where PSNH has obtained agreements to acquire underground rights on the UNH Campus, and on both shores of Little Bay, there are no existing distribution or transmission lines owned by PSNH. The underwater portion of the Little Bay crossing was previously utilized for submarine distribution cables, including a 34.5 kV distribution line. These lines have been de-energized for over twenty years.

(6) Distance along existing route;

Beginning at structure 140 in Newington, the new line will utilize a portion of a corridor currently occupied by existing 115 kV and 345 kV transmission circuits. The distance along this existing transmission electric utility corridor is approximately 0.8 miles. This segment runs from structure number 140 to the Portsmouth Substation.

(7) Voltage design rating;

The nominal voltage of the new overhead and underground/submarine transmission line will be 115 kV.

(8) Any associated new electric generating unit or units;

This section is not applicable because the Project does not include any generating units.

(9) Type of construction described in detail;

The Project will require transmission line construction and upgrades within the existing fence line at the Madbury and Portsmouth Substations. The major work categories include survey, removal of vegetation and mowing of the corridor in advance of construction, pouring foundations, excavation for cable trench and conduits, erection of structural steel and poles and connecting the new conductors to the new line terminations.[20]

Construction will be ongoing simultaneously at multiple work sites. By its very nature, transmission line construction is a serial effort, with multiple tasks being undertaken simultaneously by a variety of different disciplines.

To support the construction activities, the Project will have direct management oversight which will include, but not be limited to the Project Manager, health and safety manager, environmental manager and community relations manager. Supplemental field staff responsible for daily supervision of the work includes construction superintendents, construction inspectors, environmental inspectors, safety specialists and community relations operatives. The number of people working on the Project construction at any given moment will be dependent on the schedule of activities ongoing at that time and will vary depending on the specific nature of work. See Appendix 20, Organizational Chart for Construction.

a. Project Construction Activity Sequence

The Project will be constructed utilizing conventional overhead, underwater and underground electric transmission line construction techniques. The construction of the transmission line and associated substation work can be broken out into a number of discrete activities that include the following:

- Establishment of marshalling yards and lay down areas;
- Surveying and flagging of boundaries and resources;
- Removal of vegetation and corridor mowing in advance of construction;
- Installation of soil erosion and sedimentation controls;
- Construction of access roads and work pads;
- Relocation of existing utility infrastructure;
- Installation of foundations;
- Installation of new structures;
- Installation of conductor and shield wire;
- Installation of underground cable;
- Installation of submarine cable;

[20] For specific project details and a detailed description of the Facility, see Section 301.03(h)(1).

- Substation construction;
- Restoration of corridor; and
- Testing and commissioning.

Each of the transmission line construction activities listed above are described in detail in the following sections.

1. Establish Marshalling Yards and Lay Down Areas

Marshalling yards, as the term applies to the Project, are defined as off-ROW locations generally consisting of existing open areas approximately three to five acres in size. Marshalling yards will be selectively located off-ROW along the length of the Project and utilized for material and equipment storage, work force parking and field offices. The Applicant will seek to establish marshalling yards in previously disturbed areas which will be selected, in part, because they will have little to no environmental or community impacts. Marshalling yards will typically be located away from residential areas and will be of sufficient size to accommodate necessary vehicles and equipment and will have a means to restrict access. Typically, marshalling yards will not require tree clearing or extensive grading, will not require any disturbance to wetlands or waterbodies, and are often located on land under control of the Applicant or its contractors, by lease agreement or otherwise. Sites typically chosen include parking lots, gravel pits, and industrial sites.

As necessary, construction Best Management Practices (BMPs) will be implemented at the marshalling yards in accordance with the *New Hampshire Department of Resources and Economic Development Best Management Practices Manual for Utility Maintenance in and Adjacent to Wetlands and Waterbodies in New Hampshire*[21] (NHDRED BMP) to ensure no sediment or erosion from the marshalling yards occurs onto public ways or into any jurisdictional wetlands or water bodies.

The location of marshalling yards will be determined by the Applicant or its contractors prior to construction, and therefore, are not specifically identified in the application. As part of this application, and to the extent any other post-decision authorizations are necessary, the Applicant requests that the Committee delegate authority to NHDES to issue such approvals. As the need for such post-decision approvals arise, the Applicant will submit the necessary information to NHDES and will identify the appropriate BMPs to be utilized at an individual marshalling yard location and how any potential environmental impacts will be mitigated.

[21] *Available at* http://www.nhdfl.org/library/pdf/Publications/DESUtilityBMPrev3.pdf (January 2010).

Laydown areas, as this term applies to the Project, may be located within the Project corridor and are utilized for the temporary staging of materials and construction matting prior to installation. Laydown areas may also be used for equipment staging when the equipment is not in use. In most cases, the potential laydown areas will be previously disturbed and have exposed soils or modified vegetation such as a maintained field. If minor grading is required or if soil disturbance occurs in any proposed laydown areas, the laydown area will be restored to pre-existing topography and seeded, as appropriate.

Laydown areas may be identified, as necessary, during the course of construction. As part of this Application, and to the extent any other environmental approvals are necessary, the Applicant requests that the SEC delegate authority to NHDES to issue such approvals.

2. Surveying and Flagging of Boundaries and Resources

Surveys are required to clearly mark the edge of the Project corridor, and flag the proposed structure and guy anchor locations. Environmental and cultural resource areas as shown on Project plans will also be marked/flagged by qualified environmental staff.

3. Removal of Vegetation and Corridor Mowing in Advance of Construction

In most Project locations, tree removal, tree pruning, brush cutting or mowing, or other vegetation removal will be required prior to construction. These activities will be limited to what is necessary to provide access to proposed structure locations, to facilitate safe equipment passage, to provide safe work sites for personnel within the corridor, and to maintain safe clearances between vegetation and transmission line conductors for reliable operation of the transmission facilities. Vegetation management-related activities will be carried out in accordance with the NHDRED BMP.

Prior to vegetation removal and mowing, the boundaries of wetlands will be clearly flagged to prevent unpermitted encroachment into wetland areas. Access road improvements for tree clearing equipment will be limited to that necessary to facilitate sufficient access while minimizing overall disturbance. Tree clearing equipment will be operated from uplands wherever possible. Trees within wetlands and streams that are inaccessible by equipment staged in upland areas will be accessed on timber mats within the area to be cleared. Cultural and archaeological resources will be marked and protected during vegetation removal operations as well as all other phases of construction. Access roads over confirmed archaeological resources will use temporary timber mats.

Tree removal operations, where required, will include the removal of all tall-growing woody species within the targeted portions of the corridor.

Tall-growing trees rooted just outside the maintained corridor edge will be assessed for their potential to damage the transmission lines and may be pruned or removed to ensure reliability. Generally, trees to be removed will be cut close to the ground leaving the stumps and roots in place to minimize ground disturbance. Stumps will only be removed where required to facilitate structure installations, access, or a safe working environment. Trees are the property of the landowner; and the Applicant will coordinate with each landowner on tree disposal prior to commencing clearing operations. Trees may be stacked at the edge of the ROW or removed from the ROW, depending upon landowners' preference. In most cases, logs and slash will be removed from wetland areas. Cut trees and branches may be left in wetlands at the discretion of an environmental monitor when densities are low and leaving logs, branches and slash in wetlands is the least impacting option.

Small trees and shrubs within the ROW will be mowed, as necessary, with the intent of preserving roots and low-growing native vegetation to the extent practical. Where the ROW crosses streams and brooks, low-growing vegetation along the stream bank will be selectively cut to preserve a riparian buffer that will minimize the disturbance of stream bank soils and reduce the potential for erosion and sedimentation. In addition, the Applicant will preserve low-growing vegetation in accordance with regulatory guidance or permit conditions, as necessary, to protect rare, threatened, and endangered ("RTE") species or habitats. This Project will span more than one growing season; therefore, additional mowing of access ways and work pads may be required as vegetation regenerates in these locations.

4. Installation of Soil Erosion and Sedimentation Controls

Soil erosion and sedimentation controls will be implemented as depicted on Environmental Maps included in Appendix 2 as part of the NHDES Wetland Permit Application; and in accordance with NHDRED BMPs. The environmental controls shown on the Environmental Maps may need to be supplemented due to seasonal work, the work methods proposed, and to comply with any additional permit requirements. Any change to established environmental controls in a particular work area would require the approval of the Project's environmental monitor(s).

Some construction access roads will require additional BMPs for areas that have a higher potential to impact water quality, due mostly to steep slopes and proximity to water resources. Temporary erosion and sedimentation controls will be installed to prevent impacts to water quality resulting from land disturbance. In general, the installation of these controls will proceed in parallel with the construction of access road improvements.

Stormwater management controls will be described in the Project Stormwater Pollution Prevention Plan ("SWPPP"), to be completed prior

to construction in accordance with the National Pollutant Discharge Elimination System Construction General Permit ("CGP"). Stormwater controls will be installed, inspected, and maintained.

5. Construction of Access Roads and Work Pads

Access roads are required within the Project corridor to access work pads, pulling sites, and laydown areas during construction. Construction contractors will establish new temporary access roads where necessary. Where available, existing access roads will be used. Access roads and work pads for the Project are depicted on the Environmental Maps included in Appendix 2 as part of the NHDES Wetlands Permit Application. These Environmental Maps also show additional BMPs that will be employed in areas with steep slopes adjacent to water resources.

Trap rock aprons will be used at access road entrances to public roadways to mitigate the potential for construction vehicles to track soil onto public streets and to minimize the migration of soils off-site. Aprons placed at the intersection of an access road with a public road will remain in place except in agricultural areas, lawns and on private property if the property owner wishes to have the stone apron removed. With permission of the landowner, gates will be installed to prevent un-authorized access, as needed. Exposed soils on access roads will be wetted and stabilized as necessary during construction to suppress fugitive dust.

Temporary Access Roads to Work Pads and Laydown Areas

In most locations, access roads will be temporary. For temporary construction access to work pads, required work will be limited and will mostly consist of vegetation maintenance (e.g. mowing), limited grading and use of trap rock to facilitate access. Temporary access roads to structures will follow the contour of the existing land formation and will be designed to avoid environmentally sensitive areas to the greatest extent practicable. Temporary construction access roads will be restored. Project environmental monitors will oversee restoration activities.

Temporary Access Roads across Wetlands and Streams, and Archeologic Resource Areas

Where alternative access is not available, access across wetlands, streams, and confirmed archeologic resource areas during the Phase 1B surveys will be accomplished by the temporary placement of timber mats. Timber mats typically consist of timbers that are bolted together and placed over wetland areas so as to distribute equipment loads and minimize disturbance to the wetland and soil substrates. Temporary timber mat access roads will be removed following completion of construction. Care will be taken to avoid any deposition of soil and other debris into wetlands. If rutting, compaction, or other impacts to the wetland substrate occur during construction, these areas may require minor grading to restore preexisting topography prior to stabilization. Disturbed areas will be seeded with a

native wetland seed mix, if necessary. Exposed soils at risk of erosion will be stabilized with straw, tackifier or erosion control blankets as necessary. The use of timber matting may be reduced during specific ground conditions where the risk of soil disturbance would be minimal (dry or frozen ground).

Existing Access Roads

In limited areas there are existing access roads that may require maintenance or upgrading to support the proposed construction activities. For example, widening of existing access roads, grading, and placement of clean gravel or trap rock may be necessary to stabilize and level the roads for construction vehicles. Access road improvements and/or maintenance will be carried out in compliance with the conditions and approvals of the appropriate regulatory agencies.

Additional Off-ROW Access Roads

Proposed off-ROW access roads are shown on the Environmental Maps. If additional access ways are needed, the Applicant will, to the extent practicable, select locations that have been previously disturbed. As part of this application, PSNH requests that the SEC delegate the authority to NHDES to issue such approvals. Once the off-ROW access roads are identified, the Applicant will submit the necessary information to NHDES seeking authorization for these additional access roads.

Construction of Work Pads and Pull Pads

Upland work pads and pull pads will be created through minor grading or the addition of gravel or crushed stone to provide a level work surface for crews, equipment, and materials. Work pads are generally 100 feet by 100 feet for poured concrete foundations and 64 feet by 80 feet for direct-embed structures. In the majority of cases, the location of work pads is centered at the structure location. Pull pads are typically rectangular areas located 300 feet ahead and back of structure locations and are approximately 100 feet in width. Most pull pads are located at angle structures and dead ends. Pulling equipment will generally be set up at a 1:3 distance or greater from the highest wire attachment point on the pulling structure as called for in the Institute of Electrical and Electronics Engineers ("IEEE") Standard 524.

In certain locations for the Project, work pads were designed off center or pull pad sites were shifted to avoid potential impacts to environmentally sensitive areas. In other locations, the size of works pads and pull pads were reduced to avoid or minimize impacts to wetlands. In locations where wetlands and environmentally sensitive areas cannot be avoided, work pads and pull pads will be created through the temporary placement of timber mats.

Once construction is complete, the work pad and pull pads will be restored. Restoration efforts, including removal of construction debris and materials, minor grading to match adjacent contours, and stabilization of disturbed soil, will be completed following the construction operations. All disturbed areas around structures and other graded locations will be seeded with an appropriate seed mixture and/or mulched to stabilize the soils in accordance with applicable regulations. In wetlands, timber mats installed for work pads and pull pads will be removed in their entirety, including pieces that may have broken off during construction. Disturbed areas will be immediately restored and stabilized with oversight by an environmental monitor. Care will be taken to avoid any deposition of soil and other debris into wetlands. If rutting, compaction, or other impacts to the wetland substrate have occurred during construction, these areas may require minor grading to restore preexisting topography prior to stabilization. In disturbed areas, seeding with a native wetland seed mix may be necessary. Exposed soils at risk of erosion will be stabilized with straw, tackifier or erosion control blankets as necessary, and according to the BMPs. Temporary erosion and sediment controls will be removed following the stabilization of disturbed areas.

6. Relocation of Existing Utility Infrastructure

There are four structures in the existing PSNH corridor easement that are part of the E194 Line in Newington, in the area of the Crossings at Fox Run, that will need to be relocated in order for the new 115 kV line to be installed. In addition, certain segments of the existing distribution infrastructure in the Towns of Durham and Newington will be upgraded and/or relocated.

Structures and components not re-used for the Project will be removed or salvaged and as much of the removed material as possible will be recycled. Those components not salvaged and any debris that cannot be recycled will be removed from the ROW to an Applicant-approved off-site disposal facility. Handling of such materials will be performed in compliance with applicable laws and regulations.

The removal of wood pole structures will involve disassembling the cross-arm, insulator, and hardware structure elements first. Once those elements have been removed, the wood poles will be removed completely. The full length of the wood pole will be removed, inclusive of the embedded section in upland areas only and the remaining hole will be backfilled with common backfill. The removal of wood poles in wetland areas will be reviewed on a case-by-case basis to determine if greater disturbance can be avoided by allowing embedded sections of the pole to remain in the wetland. In the majority of locations, the existing wood pole will be cut flush with the existing grade. Where a wood pole cannot be cut flush with existing grade, the embedded section of the pole as well as a four foot section of pole above ground will remain in place to reduce tripping hazard

risks and the potential for damage to equipment during future maintenance activities.

7. Installation of Foundations

The Project will utilize two types of foundations for the transmission structures; poured concrete and direct-embed. The type of foundation to be constructed depends on structure type and soil conditions. Several structures, including deadend, running angle and certain tangent structures in which guying is restricted by corridor restraints will require reinforced concrete caisson foundations. The foundation drilling work will be performed with conventional excavating equipment and will begin by mobilizing a drilling rig/apparatus set up over the structure location. The drilling will utilize earth/rock augers to drill the required vertical shafts. The foundation drilling process involves drilling holes that vary in diameter and depth dependent on the design, structure type and results of the geotechnical report and presence of rock. Generally these foundations will typically be 20 to 30 feet deep, with diameters of between 6 and 10 feet. Once drilling is complete, a steel rebar cage and anchor bolt assembly is placed in each hole and concrete is poured and any required backfilling is completed. Concrete trucks are used to deliver the concrete mix for the foundations. Typically drilling operations occur for 2-3 days at each new structure location; however, they may be shortened or extended based on soil conditions. Should soil conditions, structure loads, or a combination of those considerations warrant, the review of alternate foundations types will be undertaken to ensure that the most appropriate and cost efficient foundation type is being utilized.

Most structures will utilize the direct embedment foundation design, where the foundation hole is excavated to the required depth using conventional methods such as an excavator to dig the hole, the structure is placed in the hole and then filled with a suitable backfill material rather than concrete. Most poles set using this type of foundation will be installed in corrugated, galvanized steel culvert pipes placed vertically in the hole to provide additional foundation support. The pipe is either screwed into the ground and the center is excavated with an auger, or the hole is excavated and the culvert placed in the hole vertically. The pole is then set inside the culvert and backfilled with select material.

Excavated material will be temporarily stockpiled next to the excavation; however, this material will be managed to prevent run off into any resource areas. If the stockpile is in close proximity to wetlands, it will be enclosed by staked straw bales or other erosion and sedimentation controls. Additional controls, such as watertight mud boxes may be used for saturated stockpile management in work areas in wetlands (i.e., swamp mat platforms) where sediment-laden runoff would pose an issue for an adjacent wetland. Following the backfilling operations, excess soil will be spread over upland areas or removed from the site in accordance with each

Applicant's policy. In locations where rock is encountered, the foundation hole will be excavated to the rock depth and the contractor will use approved methods to remove the rock including drilling, blasting, ripping and hoe ramming to achieve the required depth.

Blasting may be employed only where shallow-to-bedrock soil depths and subsurface boulders are encountered that cannot be removed by mechanical means. No blasting will occur in, or on the shoreline of, Little Bay. For transmission line construction any blasting activity, where required, will be limited to the small volume of material needed to be removed to set and plumb the pole structures. No adverse effects from blasting activity upon either sensitive natural resources or adjacent property owners are anticipated due to the small charges required for this activity. Project specific blasting specification will be included in the requirements for contractors. If a contractor is required to employ blasting during the execution of the work, the contractor must comply with PSNH's standards, as well as all applicable local, state, and federal permitting requirements regarding blasting and the safe handling of explosives. All blasting will be performed by qualified personnel who are licensed by the applicable local, state, and/or federal agencies. Town officials and abutting landowners will be notified in advance of such activity. (*See also* Section 301.08 for a further discussion related to the public health and safety of the public and workers).

Dewatering may be necessary while excavating or placing concrete for foundations. At all times, dewatering will be performed in accordance with Applicant's guidance documents as well as Project permits and approvals.

8. Installation of New Structures

Once the foundations have been installed, transmission structure installation will begin. The crews begin framing, erecting and setting the structures. The new steel structures often come in sections that are assembled on or near the foundation. For those structures with bolted flange connections, the assembly of the uppermost section will vary by structure type. Generally speaking, for a single pole structure, the second vertical section of the steel pole will be bolted to the lowest steel pole section, the appropriate structure arms will be installed and lastly the insulators and hardware to connect the conductors to the structure will be attached. In the case of H-Frame structures, a similar process will occur with two vertical poles being erected followed by the installation of the interior cross-arm and outboard arms, then the insulators and associated hardware will be affixed to the cross-arms at the appropriate attachment points.

For those steel pole structures featuring slip joint connections, the assembly of the uppermost sections will involve fitting the second steel pole section over the smaller diameter top of the lower steel pole section.

The appropriate structure arms will be installed and lastly the insulators and hardware will be attached. Cranes and/or bucket trucks are used to lift the structures and set them into position on the foundations.

Deadend and angle structures that are not self-supporting require the use of structural guying. This is consistent with other similar existing structures within the ROW. These guys will be affixed to the steel pole structure and anchored to the ground via the use of excavated block anchors (aka dead-men) in upland areas. In wetlands and other environmentally sensitive areas, screw anchors will be utilized to minimize ground disturbance.

9. Installation of Conductor and Shield Wire

Following the erection of transmission structures and installation of the insulator assemblies, conductors, shield wire, and fiber optic ground wire ("OPGW") will then be installed using stringing blocks, wire pulling ropes, and wire stringing equipment. Once the stringing blocks are in place, pulling ropes will be installed by: driving the ropes from structure to structure, walking the ropes from structure to structure or via helicopter.

Once installed, the pulling rope is attached to wire stringing equipment and used to pull the conductors from a wire reel on the ground through stringing blocks attached to the structure. Once the conductor or shield wire has been installed, the wire pulling equipment is then used to sag the wire to obtain the specified conductor tension. After the wire has been sagged it is clipped onto all structures with the permanent connection hardware.

During the stringing operation, temporary guard structures or boom trucks will be placed at road and highway crossings and at crossings of existing utility lines. These guard structures are used to ensure public safety and uninterrupted operation of other utility equipment by keeping the wire off the traveled way and away from other utility wires at these crossing locations. Shield wires and OPGW will be installed on top of the structure in a similar manner. Helicopters may be used for certain activities during the installation operation including wire stringing, clipping, and other activities as required. Timber mats will be used when temporary guard structures must be located within wetlands.

10. Installation of Underground Cable

Generally, there are three principle phases of construction for an underground cable project: (1) manhole installation, (2) duct bank installation and pavement patching, and (3) cable installation including, cable pulling and splicing. Each of these phases is described in more detail below. The phases will be conducted in sequence at each location so that several phases of construction will be ongoing simultaneously in different sections of the route. After in-street construction is completed, the pavement will be

repaired or replaced as required by the Town's Public Works to restore the street surface.

Similar to the overhead transmission construction, the underground work will be sequenced and will begin with survey for the transition structures, and marking the underground route. Access to the work sites will then be established and the required safety and erosion and sedimentation controls ("E&S") will be implemented prior to beginning construction. Environmental control measures will be monitored throughout the process until the site is restored and stabilized. A traffic control plan will also be implemented using traffic control devices to ensure safety and unimpeded movement of the traveling public. If the need arises to utilize blasting during installation of utility facilities, PSNH will follow all laws, ordinances and regulations in the use, handling, loading, transporting and storage of explosives and blasting agents.

Manhole Installation

Manholes facilitate cable installation and splicing and allow access for maintenance requirements and future repairs. The final placement of the manhole is based on the calculated pulling tensions and sidewall pressure on the cable as it goes around a bend, the maximum length of cable that can be transported on a reel based on the reel's width, height and weight, and accessibility. For the Project, one manhole will be required at the transition between the submarine cable on the east side of Little Bay, which will be approximately 10 feet wide by 30 feet long and 10 feet deep, and the remaining underground cable to be installed in conduit. For the land portion of the underground cable, fiber optic cable will be installed in the same duct bank. Due to the physical properties of fiber optic cable, the allowable pulling lengths cannot be as long as the underground power cable. As a result, handholes, which are approximately 5 feet wide by 7 feet long, are placed approximately every 600 feet.

The location of the manhole will be excavated and shored to the required dimensions for the setting of the manhole. The manhole will be manufactured at a remote location in two or more parts and delivered to the site on a tractor trailer. A crane is then used to set the manhole into the pit. The area around the manhole is then backfilled and compacted. Two covers will be set on the top of the manhole to provide future access to the manhole. The covers are set flush with the final grade and are the only portions of the manhole that are visible at the completion of the project.

Duct Bank Installation

The basic method for constructing an underground duct bank is by open-cut trenching. In open-cut trenching, the width of the trench is marked, dig-safe is contacted, and the location of existing utilities is marked.

In areas where the trench crosses or parallels pavement, the pavement is saw cut. The saw cutting provides a clean break in the pavement and defines the trench for the next activity. Saw cutting is a relatively fast operation and is not performed every day so as not to proceed too far ahead of the crew that follows. Following saw cutting, the existing pavement is removed by pneumatic hammers and loaded into a dump truck with a backhoe. Pavement is handled separately from the soil because the pavement is recycled at an asphalt batching plant.

The trench is then excavated to the required depth by a backhoe. In pre-determined areas, some of the excavation will be done by hand so as to avoid disturbing existing utility lines and/or service connections. A "clean trench" method will be used where soil is loaded directly into a dump truck for off-site recycling or disposal. The soil will not be stockpiled on site. Removal of the soil, rather than stockpiling at the site, reduces the size of the required work area and reduces the potential for sedimentation and nuisance dust. Any rock encountered during excavation will be removed by mechanical means.

The trench is sheeted and shored as required by soil conditions and Occupational Safety & Health Administration safety rules. The shoring is designed to permit the passage of traffic adjacent to the trench and will allow for the trench to be covered with a steel plate to permit traffic over the trench during non-working hours. Under typical conditions, a crew can excavate and shore approximately 100 to 200 feet of trench per day.

Once a portion of the trench is dug, Polyethylene ("PE") conduit is assembled and lowered into the trench. The area around the PE conduit is filled with thermal sand and/or concrete. Thermal sand or concrete are mixtures that have been engineered to provide adequate thermal heat dissipation. The remainder of the trench is then backfilled with either native soil or more thermal sand or concrete. When used, engineered backfill will be simple, clean material containing no chemicals or harmful elements; it simply allows the heat to more easily dissipate into the soil surrounding the cable system. A red warning tape is buried above the conduit to alert anyone that could potentially excavate over the transmission line that an electric line is buried there.

Where open trench is not possible to cross roadways or other obstacles, a pipe jacking method will be used. During this operation two pits are excavated on either side of the obstacle. A casing is advanced beneath the obstacle using hydraulic jacks installed in one of the pits until it intersects the second pit. The casing is installed to keep the bore hole from collapsing. Once complete the PE conduit is pulled through the casing, and then the space between the casing and the conduit is filled with a non-shrinking grout. The pits are backfilled similar to the open trench method.

Cable Installation, Including Cable Pulling and Splicing

Following the installation of the manhole and duct bank, the cable is installed. Prior to the installation of the cable, the conduit will be tested and cleaned by pulling a mandrel (a close fitting cylinder designed to prove a conduit's shape and size) and swab through each of the ducts. When the mandrel has been pulled successfully, the conduit is ready for installation of the cable.

Cable is installed between the manhole and/or the transition structure. To install the cable, the cable reel is set at the "pull-in" location and the cable puller is set up at the "pulling-out" location. The complete pulling process typically takes a full 8-hour shift with 4 hours required to set up, 2 hours to pull the cable, and 2 hours to clear the work zone. This process is repeated until all the cable has been installed.

After all of the cable is installed, the cables are spliced or terminated at the manhole or transition pole. Splicing or terminating high-voltage solid dielectric transmission cable is a complex operation. It typically requires four to five, 10-to-12 hour work days per manhole to complete the splicing of all three cables. The splicing operation requires a splicing van and a generator. The splicing van contains all of the equipment and material to make a complete splice. Sometimes an air conditioning unit is used to control the moisture content in the manhole. The generator provides the electrical power for the splicing van and air conditioning unit. The generator is specifically designed to minimize noise and has been successfully used in residential areas.

11. Installation of Submarine Cable

Three submarine cables will be laid and buried beneath the soft sediments of the Little Bay floor using three methods. The primary installation method uses a jet plow in the subtidal and most of the intertidal zone. Other cable installation methods will include diver burial in the shallow intertidal zone and excavation for cable trenches in the transition zone from marine to the terrestrial structures. The cable will be buried eight (8) feet in the subtidal zone and forty two inches (42) in the intertidal zone and on land.

The submarine cables will be transported to the site individually on a specially outfitted cable laying barge. Beginning on the west shore, the cable laying barge will be positioned approximately 250 feet seaward of the trench and the cable will be "pulled" into position on shore by a wire rope and winch located on shore. Once the cable has been secured at the landing site, the cable lay barge will slowly move forward under anchor winches. While the barge is moving forward, the cable will be paid out as necessary until the jet plow starts to move.

The jet plow utilizes high-volume water pressure to temporarily liquefy the soft sediments immediately ahead of the plow blade. The water is sprayed out in specially designed nozzles located along the leading edge of the jet plow's blade. The submarine cable will feed from the barge, pass through the back of the blade, and into the liquefied sediments. The majority of the sediment will settle into the trench leaving the cable installed at the desired depth.

The jet plow will reach within approximately 600 feet of the east shore, at which time the water depth will not allow further advancement of the barge towards the shoreline. At this point, the submarine cable will be unloaded from the plow, and the bitter end of the cable will be floated to the manhole using a winch from shore. The section of temporarily unburied cable between the end of jet plow position offshore and the excavated cable landing trench will be buried by divers utilizing water jet hoses and an excavator in the nearshore intertidal area. The intertidal areas that will be subject to diver burial and excavation will be enclosed within silt curtains.

The submarine cable installation process will be repeated until all three submarine cables are installed.

See Pre-Filed Testimony of Anthony Troy Godfrey, for a full description of the submarine cable installation methodology.

12. Substation Construction

The construction activities for the existing substations modifications are generally the same for both the Madbury Substation and the Portsmouth Substation. It is expected that work at multiple sites will occur simultaneously in order to meet the Project milestones for energization. The modifications at each substation will include connecting the new 115 kV AC line from the Madbury Substation to the Portsmouth Substation.

This will require the addition of a new terminal structure, 115 kV switches, breakers, bus work and associated protection and control devices inside the existing Portsmouth Substation. At Portsmouth Substation, the existing control enclosure will also be expanded within the existing fence line to accommodate new protection, control and communication devices that will be required to support the new line. At the other end of the new 115 kV transmission line, Madbury Substation will require the modification of an existing 115 kV terminal position, which will be done within the existing substation yard. This will include the addition of new 115 kV circuit breakers, switches, and some minor modification to the existing bus work and associated protection and control devices. There is an existing terminal structure at Madbury that will be modified with some minor bracing to support the new line.

The work at each station work site will include excavating and installing foundations, ground grid and underground conduits within the station footprint. Station materials, structures and equipment will be delivered to the site for installation. The steel structures and equipment will be installed on the foundations, buildings will be erected, control cables and conductors will be installed and terminated. When construction is complete, the substation yard will be restored.

13. Restoration of Corridor

After construction activities are completed, all disturbed areas within the Project corridor shall be stabilized/restored as described below. Temporary work areas and pre-construction drainage patterns will generally be restored to their pre-existing condition. Restoration efforts, including removal of construction debris, minor grading, and stabilization of disturbed soil, will be completed following the construction operations. Ditches, roads, walls, and fences will generally be restored to their former condition. Project environmental monitors shall oversee restoration activities, particularly in wetlands and other sensitive areas.

Timber mats installed for access and work pads in wetlands and over streams will be removed in their entirety. Disturbed areas must be immediately restored and stabilized. Care shall be taken to avoid any deposition of soil and other debris into wetlands or streams. If rutting, compaction, or other impacts to the wetland substrate or stream banks have occurred during construction, these areas may require minor grading to restore preexisting topography prior to stabilization. In disturbed areas, seeding with a native seed mix may be necessary. Exposed soils at risk of erosion will be stabilized with straw, tackifier, or erosion control blankets as necessary, and according to NHDRED BMPs.

All temporary access roads and work pads will be stabilized and top-seeded with a native seed mix. Construction entrance crushed stone aprons will remain in place except in agricultural areas, and lawns, where the property owner wishes to have the stone apron removed. Grades will be restored and disturbed areas loamed and seeded if the stone apron is removed. Gates and boulders may be installed, with permission or at the request of the landowner, to prevent un-authorized access as needed.

In the paved underground cable areas, after the duct bank is installed, the duct bank will be backfilled with a concrete cover or approved thermal backfill. The Project will work with the Towns and their Public Works Departments and UNH to ensure compliance with town requirements and to ensure backfill used in place of native soils consists of clean material that does not contain chemicals or harmful elements. PSNH will also ensure that all trench excavations are returned to the same or better condition than existed prior to construction. The paved surface will be restored per

the local town ordinances. Temporary pavement placed during the in-street construction will be removed, and final paving will be installed.

14. Testing and Commissioning

Following the installation, and prior to the energization, of the Project, an extensive electrical testing process is performed to confirm that each piece of equipment and circuit is installed and operating in accordance with specifications. As with the construction, the energization is a sequential process that energizes the equipment and facilities in a logical order to coordinate with the equipment and system requirements to meet the Project milestones. Transmission line or equipment outages will be necessary and will require coordination with local control centers and ISO-NE. The Project team will implement an outage and schedule process to confirm that all new or modified transmission and station facilities are sequenced into service in accordance with ISO-NE Operational procedures with no interruption of service to the distribution customers.

(10) Construction schedule, including start date and scheduled completion date;

The construction of the Project is scheduled to begin after all the necessary approvals and permits have been acquired. The construction schedule is dependent upon the SEC certification. The current construction forecasted start is in the spring of 2017 with an expected completion date in mid-2018.

The following table provides an approximate overview of the proposed schedule:

Table 1. Proposed Construction Schedule

Activity	Scheduled Start / Finish Date
Submit SEC Applications & Corps Permit	2nd Quarter 2016
SEC Approval & Corps Permits Complete*	2nd Quarter 2017
Relocation of Existing Utility Infrastructure	2nd Quarter 2017 / 3rd Quarter 2017
Transmission Line Construction	2nd Quarter 2017 / 1st Quarter 2018
Madbury / Portsmouth Substation Upgrades	2nd Quarter 2017 / 4th Quarter 2017
Transmission Underground Civil installation	2nd Quarter 2017 / 4th Quarter 2017
Transmission Underground Cable installation	3rd Quarter 2017 / 4th Quarter 2017
Transmission Submarine Cable Preparation & Installation and testing at Great Bay	3rd Quarter 2017 / 1st Quarter 2018
Energize New F107 Transmission Line	2nd Quarter 2018 / 3rd Quarter 2018

* Approval dates based on statutory timeframes.

The construction schedule and construction sequence plan for the Project has been developed by establishing key milestones and in-service dates. In the development of the schedule, consideration is given to constructability restrictions that may be encountered including, but not limited to; time of year restrictions for environmental considerations, transmission system requirements and municipal/abutter requests,

long lead material procurements, anticipated winter weather conditions and other permit/approval requirements.

The Project construction sequence plan is developed using the summary schedule to form the basis of the construction services and material supply for the substation and transmission line. A construction planning team will be involved in the further refinement of the construction sequencing including final commissioning of the modified stations and transmission line. The construction planning team includes members from the Project team, representatives from PSNH system planning, system operations and engineering, outage coordinator and the contractor(s) own management and construction teams.

Construction phasing will be carefully planned and executed. The timing and coordination of construction activities will be developed to minimize the number and duration of outages, maintain efficiencies in the construction process, maintain a safe work environment for personnel and contractors, and comply with environmental regulatory requirements.

(11) Copy of any proposed plan application or other system study request documentation required to be submitted to ISO New England, Inc. in connection with construction and operation of the proposed facility; and

Please see Appendix 21 for a copy of the Proposed Plan Application submitted to ISO New England.

(12) Copy of system impact study report for the proposed electric transmission facility as prepared by or on behalf of ISO New England, Inc. or the interconnecting utility, if available at the time of application.

Please see Appendix 22 for a copy of the New Hampshire 10 Year Reliability Project Proposed Plan Application report and letter from ISO New England determining that the Project would not create a significant adverse effect on the transmission system as provided in the Seacoast Reliability Project Proposed Plan Application.

(h) Each application for a certificate for an energy facility shall include the following:

(1) A detailed description of the type and size of each major part of the proposed facility;

The Project consists of a new overhead 115 kV electric transmission line, which will be known as the Line F107, to be located primarily within existing corridors between the Madbury Substation and the Portsmouth Substation, and modifications at both substations where the line terminates. See description in Section 301.03 (c)(1) above. The Environmental Maps, Appendix 2, and the F107 Line Structure Location Plans in the Engineering Design Drawings, Appendix 5, depict the location of each major part of the proposed facility. As discussed in Section 301.03 (b)(7) and (c)(6), PSNH has the necessary rights to construct and operate the new overhead 115 kV transmission line. The line will be comprised of overhead transmission structures and conductor, underground cable, submarine cable. The substation modifications consist of terminal

structures, breakers, disconnect switches, protection and control equipment, and miscellaneous electric infrastructure. The Project is designed in compliance with Eversource design standards and the National Electrical Safety Code ("NESC"). A detailed description of the Project is described below.

a. Overhead Transmission

The proposed 115 kV transmission Line F107 will run approximately 12.9 miles from a new 115 kV bay at Madbury Substation to a new 115 kV bay at Portsmouth Substation. The transmission line will be located primarily within an existing electric utility corridor that is currently occupied by a 34.5 kV overhead distribution line supported by direct embedded wood pole structures. Circuits along the existing corridor include:

- 34.5 kV Line 380 from Madbury Substation (Madbury, NH) to Packers Falls Substation (Durham, NH),
- 34.5 kV Line 3162 from Packers Falls Substation to the west side of Little Bay (Durham, NH)
- 34.5 kV Line 3152 from Packers Falls Substation to Newmarket Road (Durham, NH)
- 34.5 kV Line 3850 from the east side of Little Bay (Newington, NH) to the proposed crossing of the Spaulding Turnpike (Portsmouth, NH).

Following the Turnpike crossing, the line will then be located within an existing transmission corridor with existing circuits Line E194 (115 kV), Line U181 (115 kV) & Line 3135 (345 kV). Portions of Line E194 will be rebuilt to provide adequate space within the existing corridor for Line F107.

The overhead portion of the Project will be constructed predominantly on single pole structures utilizing both vertical phase over phase and delta (triangular) phasing configurations, along with open wire distribution underbuild in a horizontal phasing configuration. The structure count for Line F107 is 150; the relocation of the E194 Line includes an additional four structures (for a total of 154 transmission structures that will be built). The majority of the new structures will be directly embedded self-weathering steel monopoles. Galvanized steel may be used in certain locations that are open or near other existing galvanized structures. Some structures are proposed to be self-weathering steel H-frames. In most locations, the proposed 115 kV overhead transmission line will be underbuilt with a 34.5 kV distribution line. Some locations will utilize either a single 115 kV line or new 115 kV line built on a single circuit line next to a relocated 34.5 kV line. In locations where the 34.5 kV lines are rebuilt on their own pole line, the 34.5 kV structures are proposed to be wood monopoles. Some structures, such as running angles and dead ends, will require the installation of guy wires or reinforced concrete drilled pier foundations. Typical transmission structure heights will vary between approximately 55 feet and 105 feet above grade with the most common height being 84 feet above grade. These heights will vary depending on terrain, required vertical clearance to ground, span length,

underbuild, and other site specific conditions. *See* Engineering Design Drawings, Appendix 5, for examples of the typical structure types to be used.

The overhead conductor will be a single 1590 kcmil 45/7 ACSR "Lapwing" per phase, while the rebuilt underbuild 34.5 kV circuits will be constructed utilizing a single 477 kcmil 18/1 ACSR "Pelican" per phase and one #4/0 AWG 6/1 ACSR "Penguin" neutral wire. The line will also carry a new 24 count fiber optical ground wire ("OPGW"). In places without a fiber OPGW or in places where additional lightning protection is required, a 19#10 Alumoweld shield wire will be installed above the phase conductors.

b. Submarine / Underground Transmission

There will be two terrestrial sections of the new 115 kV line that will be constructed underground with three solid dielectric insulated cables installed in individual PE conduits. The proposed conductor size is 3,500 kcmil copper and each phase will have one cable. There will be one additional section of the new 115 kV line that will be constructed completely underwater with three specialized solid dielectric insulated submarine cables directly buried in the soft sediments across Little Bay. The proposed conductor size for the submarine cable is 2,763 kcmil (1400mm2) copper and each phase will have one cable. An all-dielectric fiber optic cable ("ADSS") will be installed in all underground sections with two ADSS cables installed in the submarine portion. All underground and submarine cables have been designed as an extra high voltage, extruded dielectric ("HVED") cable utilizing cross-linked polyethylene ("XLPE") insulation.

A detailed description of the proposed facilities is provided below.

1. Madbury Substation to NH Route 4: Structures 1 to 10

This section of the Project will be located on either PSNH fee owned property, on a newly acquired easement, or for one structure, on NHDOT ROW. The new transmission line will be located approximately 40 feet west of the existing distribution circuit. The structures along this portion of the Project will be direct embedded monopole or H-frame tubular self-weathering steel structures. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. The proposed new line will support the three 115 kV phases in a horizontal, vertical or delta phasing configuration with only structures 1 and 2 in this section including the 34.5 kV underbuild. The new 115 kV overhead line conductors will be carried on steel davit arms with suspension insulators, or directly attached to the poles or structure cross arms on suspension insulators. The 34.5 kV underbuild will be in a horizontal phasing configuration attached by suspension insulators and/or post insulators. Shield wires and neutral conductors will be attached directly to the structures at the poles or on steel davit arms. Structure heights will vary between approximately 55 feet

and 98 feet above grade. Typical span lengths in this section will average approximately 310 feet. See Appendix 5 for Engineering Design Drawings.

2. Route 4 to University of New Hampshire Parking Lot A: Structures 10 to 23

This section of the Project is predominantly within an existing Pan Am Railroad corridor. Additionally, PSNH has contracted to expand the corridor to include 25 feet of new width on UNH property. One structure, will be located entirely on new easement that PSNH has contracted to acquire on UNH property. The new transmission centerline will be approximately 50 feet from the newly acquired western corridor edge and 36 feet from the existing rail centerline. The transition structure placed on the newly acquired easement will be approximately 95 feet west of the railroad centerline. The structures along this portion of the Project will be direct embedded monopole, tubular self-weathering steel or galvanized steel. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 350 feet. The new 115 kV overhead line conductors will primarily be in a delta phasing configuration on steel davit arms with suspension insulators or on braced post insulators, with the 34.5 kV underbuild in a horizontal phasing configuration attached by suspension insulators and/or post insulators. Shield wires and neutral conductors will be attached directly to the structures at the poles or on steel davit arms. Structure heights will vary between approximately 80 feet and 95 feet above grade. See Appendix 5 for Engineering Design Drawings.

3. Structure 23 to University of New Hampshire Waterworks Road: Underground Cable

This segment of the Project will be installed as an underground cable, in a buried duct bank consisting of PE and polyvinyl chloride ("PVC") conduits, on a newly acquired easement on UNH property. This segment will begin on a monopole self-supported self-weathering steel transition structure. The transition structure will be approximately 80 feet in height and will have the cable terminations and surge arresters located on davit arms in a delta configuration. The underground segment will continue approximately 2,100 feet along a new underground corridor located on University of New Hampshire property. The underground to overhead transition structure will be a monopole self-supported self-weathering steel structure approximately 80 feet in height and will have the cable terminations and surge arresters located on steel davit arms in a delta configuration.

The underground portion of the Project will consist of three solid dielectric insulated cables installed in individual PE conduits. The nominal trench for the duct bank will be five (5) feet wide by five (5) to twenty-two (22) feet

deep. The duct bank will consist of four 8-inch diameter PE conduits, two 4-inch diameter PVC conduits for fiber-optic communication to protect the transmission lines, and one 2-inch diameter PVC conduit for a ground cable. The conduits will be directly buried with a minimum of 30 inches of cover, except for the section beneath Main Street, Durham. Due to the physical properties of fiber optic cable, the allowable pulling lengths cannot be as long as the underground power cable. As a result, handholes, which are approximately 5 feet wide by 7 feet long, are placed approximately every 600 feet along the underground route.

This portion of the line will be installed inside conduits within a reinforced concrete casing pipe installed beneath the road. The casing pipe will be installed beneath Main Street using a pipe-jacking construction method for a distance of approximately one hundred forty (140) feet. See Appendix 5 for Engineering Design Drawings.

4. University of New Hampshire Waterworks Road to Packers Falls Substation: Structures 24 to 49

This section of the Project will be constructed within existing PSNH electric utility easements. The new transmission centerline will be located in the center of an approximately 100 foot wide corridor. The structures along this portion of the Project will be direct embedded monopole, tubular self-weathering steel or galvanized steel. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 370 feet. The new 115 kV overhead line conductors will be primarily in a delta phasing configuration on steel davit arms with suspension insulators or on braced post insulators, with the 34.5 kV underbuild in a horizontal phasing configuration attached by suspension insulators and/or post insulators. Shield wires and neutral conductors will be attached directly to the structures at the poles or on steel davit arms. Monopole structure heights will vary between approximately 80 feet and 100 feet above grade. See Appendix 5 for Engineering Design Drawings.

5. Packers Falls Substation to Structure 57: Structures 49 to 57

This section of the proposed Project will be constructed within existing PSNH electric utility easements. From Packers Falls Substation to NH Route 108, the new double circuit transmission line will share the 100-foot wide corridor with another existing 34.5 kV electric utility line. The new centerline will be offset parallel to the existing distribution circuit by approximately 37 feet and be located approximately 42 feet from the Northern corridor edge. The structures along this portion of the Project will be direct embedded monopole, tubular self-weathering steel. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied

loads. Span lengths will average approximately 350 feet. The new 115 kV overhead line conductors will be primarily in a delta phasing configuration on braced post insulators, with the 34.5 kV underbuild in a horizontal phasing configuration, attached by suspension insulators and/or post insulators. Shield wires and neutral conductors will be attached directly to the structures at the poles or on steel davit arms. Monopole structure heights will vary between approximately 80 feet and 95 feet above grade. See Appendix 5 for Engineering Design Drawings.

6. Structure 57 to NH Route 108 & Longmarsh Road: Structures 57 to 62

This section of the proposed Project will be constructed within existing PSNH electric utility easements. From Packers Falls Substation to NH Route 108, the new double circuit transmission line will share the 100-foot wide corridor with another existing 34.5 kV electric utility line. The new centerline will be offset parallel to the existing distribution circuit by approximately 35 feet and be located approximately 45 feet from the northern corridor edge. The structures along this portion of the Project will be direct embedded multi-pole H-frame tubular self-weathering steel. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 380 feet. The 115 kV electric conductors will be in a horizontal phasing configuration attached to a horizontal crossarm by suspension insulators, with the 34.5 kV under build in triangular phasing configuration utilizing spacer cable connected to a messenger cable attached to one of the 115kV poles on triangular shaped spacer insulators. Intermediate single wood stub poles will be installed to support the spacer cable on long spans. Multi-pole H-frame structure heights will vary between approximately 50 feet and 80 feet above grade. Single wood stub poles will vary between approximately 30 feet and 35 feet above grade. Shield wires and neutral conductors will be attached directly to the structures at the poles or on steel davit arms. See Appendix 5 for Engineering Design Drawings.

7. Longmarsh Road to Timber Brook Lane: Structures 62 to 64

This section of the proposed Project will be constructed within existing PSNH electric utility easements. The new transmission centerline will be located approximately 40 feet from southern edge of the approximately 100 foot wide corridor. The existing 34.5 kV line will be relocated to approximately 30 feet off the northern edge of the corridor. The 115kV structures along this portion of the Project will be direct embedded monopole, tubular self-weathering steel. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 400 feet. The new 115 kV overhead line conductors will be in a delta phasing configuration on braced post insulators. The 34.5

kV line will be direct embedded wood poles. The new 34.5 kV overhead line conductors will be in a horizontal phasing configuration on post insulators on a wood or fiberglass crossarm. Shield wires and neutral conductors will be attached directly to the structures at the poles or on steel davit arms. The new 115kV monopole structure heights will vary between approximately 70 feet and 80 feet above grade. The new 34.5kV structure heights will vary between approximately 40 feet and 45 feet above grade. See Appendix 5 for Engineering Design Drawings.

8. Timber Brook Lane to Durham Point Road: Structures 64 to 94

This section of the proposed Project will be constructed within existing PSNH electric utility easements. The new transmission centerline will be located in the center of an approximately 100 foot wide corridor. The structures along this portion of the Project will be direct embedded monopole, tubular self-weathering steel. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 400 feet. The new 115 kV overhead line conductors will be primarily in a delta phasing configuration on steel davit arms with suspension insulators or braced post insulators, with the 34.5 kV underbuild in a horizontal phasing configuration attached by suspension insulators and/or post insulators. Shield wires and neutral conductors will be attached directly to the structures at the poles or on steel davit arms. Monopole structure heights will vary between approximately 85 feet and 105 feet above grade. See Appendix 5 for Engineering Design Drawings.

9. Durham Point Road Crossing: Structures 94 to 96

This section of the proposed Project will be constructed within existing PSNH electric utility easements. The new transmission centerline will be located approximately 40 feet from the northern edge of the approximately 100 foot wide corridor. The existing 34.5 kV line will be relocated to approximately 30 feet off the southern edge of the corridor. The 115kV structures along this portion of the Project will be direct embedded monopole, tubular self-weathering steel. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 410 feet. The new 115 kV overhead line conductors will be primarily in a delta phasing configuration on braced post insulators. The 34.5 kV line will be direct embedded wood poles. The new 34.5 kV overhead line conductors will be in a horizontal phasing configuration on post insulators on a wood or fiberglass crossarm. Shield wires and neutral conductors will be attached directly to the structures at the poles or on steel davit arms. The new 115kV monopole structure heights will vary between approximately 80 feet and 95 feet above grade. The new 34.5kV structure heights will vary between approximately 40 feet and 45 feet above grade. See Appendix 5 for Engineering Design Drawings.

10. Durham Point Road to Little Bay Crossing: Structures 96 to 101

This section of the proposed Project will be constructed within existing PSNH electric utility easements and will consist only of the new 115 kV overhead transmission line. The new transmission centerline will be located in the center of an approximately 100 foot wide corridor. The structures along this portion of the Project will be direct embedded monopole, tubular self-weathering steel with some multi-pole horizontal configuration structures. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 450 feet. The new 115 kV overhead line conductors will be primarily in a delta phasing configuration on steel davit arms with suspension insulators or braced post insulators. Some structures will utilize multi-pole horizontal configurations with the conductor attached on a crossarm with suspension, or strain, insulators. Shield wires will be attached directly to the structures at the poles or on steel davit arms. Structure heights will vary between approximately 66 feet and 85 feet above grade. See Appendix 5 for Engineering Design Drawings.

11. Little Bay Crossing: Submarine Cable

This section of the proposed Project will be installed as a submarine cable. The cables will be installed in the existing, charted cable corridor across Little Bay. The existing cable corridor is approximately 1,000 feet in width. The transition from overhead to submarine cable on the western shore will occur on a monopole self-supported weathering steel structure. The pole will be approximately 80 feet in height and will have the cable terminations and surge arresters located on davit arms in a delta configuration. The submarine cable will proceed underground from the transition structure approximately 360 feet to the edge of Little Bay. From there the submarine cable will cross the bay a distance of approximately 5,470 feet and terminate in a manhole on the eastern shore of Little Bay

The proposed submarine cable design will consist of three individual solid dielectric insulated cables directly buried in the soft sediments across the bay. The cables will include a lead sheath to prevent water ingress and will also have an outer metallic armoring (copper wires) to provide mechanical strength during cable installation and retrieval activities. A fiber optic cable will be bundled with two of the three conductors to allow for a communication path. The nominal depth of burial for each cable is 42 inches in the shallow mud flats on the western shore and eight (8) feet in the deeper portions of the bay. Each cable will be separated by a distance of approximately 30 feet to prevent inadvertent mechanical damage during subsequent cable installation activities. See Appendix 5 for Engineering Design Drawings.

12. Little Bay Crossing to Little Bay Road: Underground Cable

This segment of the Project will be installed as an underground cable in a buried duct bank consisting of PE and PVC conduits. This segment will begin at a new precast concrete manhole located in the corridor on the eastern side of Little Bay in Newington and will proceed approximately 340 feet easterly to Gundalow Landing Circle in Newington. The underground segment will continue approximately 1,120 feet along Gundalow Landing Circle within the public ROW to three self-supported steel transition structures located approximately 10 feet off Little Bay Road. The total length of the underground segment is approximately 1,470 feet. The transition structures will be approximately 65 feet in height and will have the cable terminations and surge arresters located on davit arms in a horizontal configuration.

The proposed underground transmission line will consist of three solid dielectric insulated cables installed in individual PE conduits. The nominal trench for the duct bank will be five (5) feet wide by five (5) to eight (8) feet deep. The duct bank will consist of four 8-inch diameter PE conduits, two 4-inch diameter PVC conduits for fiber-optic communication to protect the transmission lines and one 2-inch diameter PVC conduit for a ground cable. The conduits will be directly buried with a minimum of 30 inches of cover. Due to the more delicate nature of fiber optic cable the allowable pulling lengths cannot match the underground power cable. As a result handholes, which are approximately 5 feet wide by 7 feet long, are placed approximately every 600 feet along the underground route.

See Appendix 5 for Engineering Design Drawings.

13. Little Bay Road to Fox Point Road: Structures 102 to 115

This section of the Project will be constructed within existing PSNH electric utility easements and will consist only of the new 115 kV overhead transmission line. The new transmission centerline will be located in the center of an approximately 100 foot wide corridor. The structures along this portion of the Project will be direct embedded monopole, tubular self-weathering steel with some multi-pole horizontal configuration structures. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 520 feet. The existing 34.5kV line will be removed in this section of the corridor. Some of the new 115 kV overhead line conductors will be in a delta phasing configuration on steel davit arms with suspension insulators. Others structures will utilize multi-pole horizontal configurations with the conductor attached directly to the pole or on a horizontal crossarm with suspension insulators. Shield wires will be attached directly to the structures at the poles or on steel davit arms. Structure heights will vary

between approximately 60 feet and 85 feet above grade. See Appendix 5 for Engineering Design Drawings.

14. Fox Point Road to Spaulding Turnpike Crossing: Structures 115 to 137

This section of the Project will be constructed within existing PSNH electric utility easements. The new transmission centerline will be primarily located approximately 40 feet from southern edge of the approximately 100 foot wide corridor. The existing 34.5 kV line will be relocated to approximately 30 feet of the northern edge of the corridor. The 115 kV structures along this portion of the Project will be direct embedded monopole tubular self-weathering steel. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 420 feet. The new 115 kV overhead line conductors will primarily be in a delta phasing configuration on steel davit arms with suspension insulators or braced post insulators The 34.5 kV line will be direct embedded wood poles. The new 34.5 kV overhead line conductors will be in a horizontal phasing configuration on post insulators on a wood or fiberglass crossarm. A portion of the line in this segment will transition to double circuit direct embedded monopole, tubular self-weathering steel structures. Conductors will be in a delta phasing configuration on steel davit arms with suspension insulators, with the 34.5 kV underbuild in a horizontal phasing configuration. Shield wires and neutral conductors will be attached directly to the structures at the poles or on steel davit arms. The new 115 kV monopole structure heights will vary between approximately 65 feet and 100 feet above grade. The new 34.5 kV structure heights will vary between approximately 35 feet and 70 feet above grade. See Appendix 5 for Engineering Design Drawings.

15. Spaulding Turnpike Crossing to Structure 142: Structures 137 to 142

After crossing Spaulding Turnpike, the proposed Project will be constructed within an existing 300 foot wide PSNH electric utility easement. Structures along this portion of the Project will be direct embedded monopole, or H-Frame, tubular self-weathering steel. Some tangent, running angle, and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 435 feet. The 115 kV phase conductors will be in a horizontal phasing configuration with no distribution underbuild. Shield wires will be attached directly to the structures at the poles or on steel davit arms. Structure heights will vary between approximately 70 feet and 85 feet above grade. See Appendix 5 for Engineering Design Drawings.

16. Spaulding Turnpike Crossing to Portsmouth Substation: Structures 142 to 151

After crossing Spaulding Turnpike, the Project will be constructed within an existing 300 foot wide PSNH electric utility easement. This corridor currently includes two other 115 kV lines (U181 & E194) and one 345 kV line (3135). To make room for Project, portions of the existing 115 kV Line E194 will be relocated approximately 25 feet north of its existing location. The E194 structures will be constructed of monopole tubular self-weathering steel on a drilled pier foundation. The proposed new F107 Line will be approximately 37 feet south of the rebuilt Line E194, 50 feet north of the existing Line U181 and 125 feet north of the existing Line 3135. Structures along this portion of the Project will be direct embedded monopole, or H-Frame, tubular self-weathering steel. Some tangent, running angle, and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 380 feet. The 115 kV phase conductors will be in a horizontal, vertical, or delta phasing configuration with no distribution underbuild. The new 115 kV overhead line conductors will be carried on steel davit arms with suspension insulators, or directly attached to the poles or structure cross arms on suspension insulators. Shield wires will be attached directly to the structures at the poles or on steel davit arms. Structure heights will vary between approximately 30 feet and 95 feet above grade. See Appendix 5 for Engineering Design Drawings.

17. Madbury and Portsmouth Substations

Two PSNH substations will require modifications as part of this Project. Madbury Substation, off Miles Lane in Madbury, NH, and Portsmouth Substation at 280 Gosling Road in Portsmouth, NH, are being upgraded to accept a new line terminal position for the new F107 Line. There will be no expansion of the site or fenced area at either substation. All work will be occurring inside the existing fenced areas.

At Madbury Substation, there is an existing steel terminal structure, approximately 50 feet tall, already in place to accept the new line. Structural modifications will be performed on this terminal structure, and include the installation of steel bracing as well as modifications to the existing foundation. In addition to this structure work, a new 115 kV disconnect switch and circuit breaker will be installed. This will allow the new transmission line to be isolated from the rest of the electrical bus, protect critical station components from damage during a line fault, and allow for de-energization of the line for maintenance. Additionally, new coupling capacitor voltage transformers ("CCVTs") and lightning arrestors will be installed. The fiber optic cable from the new transmission line will be tied into the existing control enclosure to connect into PSNH's existing communication network. A 55 foot wood pole will be installed so that the

fiber optic cable from the transmission line can be tied into the existing substation control closure. Additional controls and relaying for the new line will be installed in the existing control enclosure. There will be no expansion of the existing enclosure.

At Portsmouth Substation, a new bus extension will be installed with a new 50 feet tall galvanized steel terminal structure with two 10 feet tall lightning rods required to support the F107 Line. This work will include installation of rigid aluminum bus from an existing switch to the proposed location for the new line terminal structure. A new 115 kV disconnect switch will be installed on top of the terminal structure. Additionally, a new 115 kV circuit breaker, three CCVTs and lighting arrestors will be installed. This will allow the new transmission line to be isolated from the rest of the electrical bus, protect critical station components from damage during a line fault, and allow for de-energization of the line for maintenance. The fiber optic cable from the new transmission line will be tied into the existing substation control enclosure to connect into PSNH's existing communication network. New control cabinets and relays will be installed within the control enclosure to accommodate the proposed line. Due to limited room in the existing enclosure, the enclosure will be expanded approximately 30 feet to the northeast. This expansion will be supplied with power from three new station service voltage transformers ("SSVT") which will be installed on the 115 kV bus. The expanded control enclosure will be a reinforced masonry building with wood truss roof. The exterior will be sided with vinyl siding and asphalt shingles to match the existing facility. See Appendix 5 for Engineering Design Drawings.

(2) Identification of the applicant's preferred choice and other alternatives it considers available for the site and configuration of each major part of the proposed facility and the reasons for the preferred choice;

a. Preferred Location

The location of the Project was chosen after PSNH conducted a thorough analysis of potential alternatives. As described in sections 301.03 (c)(1) and 301.03 (h)(1), and as depicted on Appendix 1, the Project will be sited within an existing utility corridor that contains one or more existing 34.5 kV electric distribution lines or 115kV transmission lines, has existed for decades, and is the least impactful of the three route identified alternatives between the existing Madbury and Portsmouth substations. Section 301.03 (h)(1) describes in detail each segment of the location of the Project.

The location of the Project was chosen based on an analysis of the chosen route and all other alternatives that PSNH reviewed. The selected route represents the most efficient and least cost alternative that will solve the local electrical reliability problems identified by the *New Hampshire/Vermont 2011 Needs Assessment Report* because it is located almost entirely within an existing utility corridor, requires fewer land acquisitions than the other alternatives, does not

have significant utility corridor constraints, would result in fewer impacts to wetlands and other environmental resources, has fewer permitting risks and associated schedule delays, and can be built within the desired timeframe identified by ISO-New England.

b. Site Selection Process

As part of its route selection process, PSNH analyzed alternative routes within the area between the Madbury and Portsmouth substations. The study area included the Lee, New Hampshire area to the west, Dover, New Hampshire and Eliot, Maine area to the north, New Castle, New Hampshire and Kittery, Maine area to the east, and Stratham, New Hampshire area to the south. Route locations beyond these general limits were not evaluated because any resulting route options would have been significantly longer, resulted in greater impacts and higher costs, and did not provide the necessary electrical solutions that the Project was designed to meet.

1. Route Options Considered and Rejected

Early in the process, routes along the Spaulding Turnpike and Route 4 were investigated; however, the potential route options associated with the use of the Route 4 and Spaulding Turnpike corridors were eliminated from further consideration following discussions with the NHDOT. Specifically, NHDOT maps indicated that there would be space constraints for co-locating a transmission line and construction presented safety challenges associated with traffic density. In addition, PSNH would need to obtain rights from the NHDOT, as there are currently no rights in either the Route 4 or Spaulding Turnpike corridors to site and construct a 115-kV transmission line, regardless of its configuration (i.e., overhead or underground). As there are other potential viable and less costly route options available that would meet the Project schedule and be consistent with the evaluation criteria for route selection, these State-corridor options are currently eliminated from further consideration.

2. Alternate Routes Evaluated

PSNH identified and reviewed three potential route alternatives, which were divided into geographic groupings: the Northern Route Alternative, the Middle Route Alternative, and the Southern Route Alternative. *See* Appendix 23 for an overview map of the three different route alternatives. The Northern Route and the Southern Route Alternative were determined to be unavailable due to numerous issues, described in more detail below.

c. The Northern Route Alternative

The Northern Route Alternative would have utilized existing transmission corridors that travel east from Madbury, New Hampshire into Eliot, Maine, turn to head southeast to Kittery, Maine and then return into Portsmouth, New Hampshire. The Northern Route Alternative was not considered available because it presented significant constructability, permitting, land rights, and cost

issues. Primarily, the 12.5 mile long Northern Route was considered unavailable because 11.5 miles of the existing 115 kV and 345 kV transmission lines within the existing corridor would need to be relocated and rebuilt to accommodate the new line; the construction of the new line and relocation of existing transmission lines would have necessarily required the construction of approximately 24 miles of transmission lines. The relocation and rebuild for a significant portion of the new line would increase cost, add one or more years to the overall Project schedule, and could potentially jeopardize the stability of the electric system in the region during construction because the existing transmission lines would have been removed from service for extended periods of time.

The Northern Route Alternative was determined unavailable in part because 11.8 miles of additional ROW would be needed. To secure these rights, PSNH would have to engage in landowner discussions along significant portions of the route in both the State of New Hampshire and State of Maine. Such efforts which would not only increase costs and extend the Project timeframe, but the Project could potentially have been blocked by a group of unwilling landowners. In particular, the existing corridor in and around Kittery, Maine presented severe constraints for the construction and operation of an additional 115 kV transmission line. This route also had two significant water crossings over the Piscataqua River, which would add to the complexity and cost.

Finally, the Northern Route Alternative presented risks associated with State permitting and siting requirements in two states, which would likely expand the time table for Project completion. Both Maine and New Hampshire would have permitting and siting authority, which would increase the complexity of the process.

For all of these reasons, the Northern Route was considered unavailable.

d. The Southern Route Alternative

The Southern Route Alternative traveled south from Madbury until it reached Stratham, New Hampshire where the line would head east into Greenland, New Hampshire, and eventually turn north into Portsmouth. The first 4 miles of the Southern Route would have utilized the existing railroad corridor and the existing PSNH utility corridor from Madbury through Durham—the same corridors that will be used by the preferred route. The Southern Route was considered unavailable because it would likely create more voltage and reliability issues than it would solve. The Southern Route Alternative was almost twice the length of the Northern Route and the Middle Route, approximately seven (7) miles longer, which would result in greater "line-loss" and inefficiency. Also, if the line were routed farther to the south of the Project area, the new 115 kV transmission line would be further from the end point connections of the Madbury Substation and the Portsmouth Substation. As the length of the line increases, the cost of the Project increases significantly. Further, costs would also be increased as this route would require construction of an additional capacitor bank at the Rochester or Madbury substation not be required for the other routes.

The Southern Route also presented other technical issues associated with constructing the Project through the Portsmouth traffic circle, the need to secure additional land rights to construct the Project, and greater environmental impacts to wetlands and State-designated prime wetlands in the southern sections of the State.

For these reasons, the Southern Route Alternative was not considered available.

e. The Middle Route Alternative

The Middle Route Alternative, the preferred route, is described in detail in Section 301.03 (h)(1) of the Application. The Middle Alternative was eventually chosen as the preferred route because it maximizes the use of the existing linear corridor that already contains existing electric utility lines for the entire route, including an existing submarine cable corridor through Little Bay. It also did not require any additional land rights, it minimizes and mitigates impacts to environmental and historical resources, it maximizes the electrical reliability of the regional electrical system while addressing the needs in a cost-effective manner, and it will ensure that a Project is designed and constructed to meet ISO-NE's project requirements.

1. Route Variations

After the route was chosen and meetings with stakeholders were held, PSNH further studied and considered route variations within the identified route to optimize the construction and operation of the new 115 kV transmission line. PSNH closely examined variations, including variations specifically suggested by the Towns of Newington and Durham. Within the identified route, PSNH examined possible route variations in ROWs that already contain an existing PSNH owned and operated distribution or transmission line and also in other areas along existing municipal roads and private property in areas with existing utility easements. After review, PSNH determined that there were some minor route variations along the identified route located in the towns of Durham and Newington that were viable .

For a majority of the route, route variations were not available for consideration because only one cable corridor exists to reach Little Bay. In fact, the selected route from Madbury substation south to Packers Falls Substation and east to Little Bay was the only option available to reach the western shore of Little Bay.

Alternate locations for crossing Little Bay were reviewed. In each case, no other utility corridor exists to link any other crossing with the Project route. The use of another crossing location would have required the acquisition of new property rights and the creation of new utility corridor. These alternative crossings were not considered further due to the need to acquire additional rights across Little Bay.

After crossing Little Bay underwater, PSNH then evaluated three possible route variations in consultation with the Town of Newington. This evaluation resulted in: (1) a route that travels underground in the public road through Gundalow Landing Circle until reaching a transition structure that would be located on the easterly side of Little Bay Road, and then continuing overhead in the existing ROW until the Spaulding turnpike ("Route Variation 1"); (2) a route variation that makes landfall from Little Bay south of Gundalow Landing Circle and travels underground through the northern side of Great Bay National Wildlife Refuge ("Wildlife Refuge") and underground alongside Arboretum road until it transitions to overhead on the eastern side of Portsmouth International Airport at Pease ("Route Variation 2"); or (3) a route that travels underground through Gundalow Landing Circle, Little Bay Road, and Arboretum drive until it transitions to overhead on the eastern side of Portsmouth International Airport at Pease ("Route Variation 3"). The second and third options were suggested by the town of Newington as alternatives. See Appendix 24 T*own of Newington Suggested Alternative Routes*.

In addition to these three Route Variations, numerous minor shifts within each Route Variation were examined. As an example, the route through the Pease Tradeport included such alternates as multiple underground paths through the Wildlife Refuge, various routes along Arboretum Drive, various routes cutting through Pease International Airport and inclusion of overhead sections through Pease Tradeport. The variations were considered in consultation with the Town of Newington and received feedback as a result of public presentations to the town of Newington.

As part of the route variation analysis, PSNH discussed the proposed Project with local officials, the Federal Aviation Administration (FAA), the Pease Development Authority, and the Great Bay Wildlife Refuge. As a result of these discussions, and following a thorough analysis consistent with Good Utility Practice, PSNH ultimately determined that Route Variation 1, the route that travels underground through Gundalow Landing until it transitions to overhead at a transition structure on the easterly side of Little Bay Road, continuing within existing utility ROW to the Spaulding Turnpike, (a.k.a. Route Variation 1), was the only viable route.

Route Variation 2, presented two significant challenges, crossing the Wildlife Refuge and crossing designated Superfund site on the Pease property, specifically Site 8, Fire Department Training Area 2, AT008, NHDES Site # 100330508. PSNH and the Town of Newington consulted with Wildlife Refuge regarding Route Variation 2. Most importantly, Route Variation 2 would require that sections of the Wildlife Refuge be impacted or permanently converted to transmission ROW. Wildlife Refuge personnel informed PSNH and the Town of Newington that the Wildlife Refuge is focused on the restoration of bat habitat, which means preserving forested lands or lands that primarily consists of trees. Based on

the potential impacts to the Wildlife Refuge associated with installing the transmission cable underground, the Wildlife Refuge indicated that it would not support hosting the Project on its land. *See* James Jiottis Pre-Filed Testimony Attachment B (correspondence from the Wildlife Refuge).

The Town of Newington also contacted the Wildlife Refuge and its regional management and requested that the Wildlife Refuge grant PSNH permission to traverse the refuge with a transmission line. The Wildlife Refuge repeated its concerns to the Town and stated it would not support a transmission line (overhead or underground) through the Wildlife Refuge. *See* James Jiottis Pre-Filed Testimony Attachment C, Newington Town Minutes re: discussion with the Wildlife Refuge.

Moreover, Route Variation 2 would have also required the line to travel underground from the easterly boundary of the Wildlife Refuge, along Arboretum Drive, to a point on the eastern side of the Pease Runway due to the very close proximity of the Pease runway. This routing would also have required the underground line to pass through a United States. Environmental Protection Agency ("EPA") designated Superfund site on the Pease property, specifically Site 8, Fire Department Training Area 2, AT008, NHDES Site # 100330508. Placing an underground line through this Superfund site would certainly increase Project costs and create additional environmental risks to the surrounding area and, potentially, to installation personnel, and PSNH employees.

Route Variation 3 would require additional portions of the line to be buried within municipal roads through the town of Newington, which presents significant engineering design complications and would dramatically increase the cost of the Project.

Siting the line underground along Little Bay Road, McIntyre Road, and Arboretum drive would also require purchasing additional property rights from the Newington residents and the Pease Development Authority. Route Variation 3 would also require crossing of the EPA Superfund site. Based on the additional distance of underground required for this option (approximately 1.5 miles), the corresponding costs, the need for additional land rights, the environmental concerns, and the fact that there was no technical reason to site the Project underground, Route Variation 3 was also considered not to be a viable alternative.

After evaluating each of the issues accompanying these alternatives, PSNH determined that Route Variation 1 was on balance, the only route available that met the routing objectives.

Design Optimization Within the Preferred Route

After the preferred route was selected, PSNH worked diligently to optimize the design of the Project in accordance with Good Utility

Practice. PSNH has designed the Project to limit potential impacts to the environment, aesthetics, and historical and cultural resources. PSNH also worked with individual communities to address local concerns.

The overhead portion of the Project will be constructed predominantly on single pole structures, with other structure designs used in certain locations to avoid and minimize potential visual impacts.

The structure height, type and specific locations were optimized to reduce potential impacts to aesthetics, above and belowground cultural resources, wetlands and other environmentally sensitive areas. Where possible, environmentally sensitive areas were spanned such that no disturbance is required and structures were also shifted outside environmentally sensitive areas, where possible. Construction access points were also identified such that activities during construction would minimize the need to impact sensitive areas.

The structure color along the route was optimized to blend in with surroundings or mimic existing features. The majority of the line will utilize structures with a weathering steel finish, mimicking the color of wood structures or surrounding trees. In a few selected areas, a galvanized steel structure may be used as it blends into the background (open sky) better than a weathering steel finish.

PSNH met with abutters along the proposed route and discussed planned structure locations. Some shifts along the centerline were made to respond to landowners' specific requests. These shifts were generally limited to between five to fifty feet and did not result in new environmental impacts, and were intended to mitigate visual concerns of the abutters.

In the case of the shared corridor with the railroad, specific structure types were used to maintain required code and railroad clearances. PSNH also worked with the railroad to ensure its design will not adversely affect railroad signals.

The majority of the corridor will utilize a double circuit structure design, which consists of a single monopole that supports the existing distribution line and the new transmission line. This design makes efficient use of the corridor by reducing the amount of structures and also minimizing impacts to the corridor.

The existing ROW from Madbury Substation to the UNH "A" lot in Durham, which is adjacent to the existing PanAm railway corridor, was expanded to reduce the number of structures, utilize lower structures, facilitate construction, and improve worker safety. PSNH has contracted to obtain additional easements and purchase new fee property in these locations.

In consultation with the Town of Durham, PSNH also altered its design through the Town and the UNH campus. A section of the Project will be constructed underground within the downtown area for approximately 2,100 feet. This underground section will begin north of Main Street at UNH "A" lot, travel under Main Street, and return to the overhead design south of Main Street, near the intersection of Colovos and Waterworks Roads. The underground section will be placed within existing and new utility easements. PSNH has contacted with UNH for the new required for this construction.

The underground line design is placed in parking lots, and within an existing utility corridor and along existing roadways to minimize impact to the area. PSNH collaborated with the Town and UNH on the design, to ensure it does not interfere with either the Town's or UNH's future plans. The design requires a new easement from UNH "A" lot and along the southern section near Colovos Road; PSNH has contracted to obtain these new rights.

Through collaboration with the Town, PSNH was also able to optimize its road crossing designs by placing structures further from the road crossing and using alternative structure designs, such as H-frames at road crossings.

To facilitate construction in other areas of Durham, sections of the existing distribution lines, roadside and within the ROW will be upgraded. On Durham Point Road and Long Marsh Road, existing roadside distribution lines will be upgraded to three phase 34.5 kV. This will allow the existing 34.5 kV distribution line to be relocated and reconstructed in the ROW. The upgraded roadside distribution will remain and provide a back-up feed to the Durham Point road area, improving reliability in the section of Durham.

The Town of Durham also raised certain concerns with a section of the Project that passes through several neighborhoods east of Route 108, including, Cutts Road, Frost Drive and Sandy Brook Drive. PSNH offered to utilize two different design options through this area, namely, a design which kept the 115 kV and 34.5 kV lines on shorter but separate structures or a double circuit monopole design on slightly taller structures. The Town allowed PSNH to work directly with abutters on the structure design selection. The Town agreed to support the design selected by the majority of abutters in this area. Ultimately the majority of abutters preferred the monopole double circuit design because it reduced the amount of equipment placed within the ROW.

On the Durham side of the Little Bay crossing, PSNH initially only had an easement to construct overhead electric lines to edge of Little Bay. However, after working closely with the landowner that directly abuts Little Bay on the Durham side, PSNH was able to contract to acquire new

land rights, which will allow for the structure to be moved approximately 360 feet from the edge of the Bay. The relocation of the transition structures will avoid and significantly minimize potential views of the Project from Little Bay and the surrounding properties and will also reduce potential environmental concerns and facilitate construction at this location.

On the Newington side of the Little Bay crossing, PSNH initially proposed to use the existing underwater cable landing at the shoreline of Little Bay. Following this route would have required the Project to remove significant amounts of ledge, resulting in major disturbances to the shoreline and the landowner's property. PSNH successfully negotiated with the landowner on the easterly side of Little Bay to obtain additional underground rights to facilitate a shift in the location of the submarine cable landfall. This allowed for the cable to be brought on-shore at a reduced cost with minimal impact to the shoreline and the landowner's property

The section of underground cable along Gundalow Landing road to the crossing of Little Bay Road will be placed within the road ROW. PSNH has investigated relocating this design to the edge of the road ROW at the request of the Town of Newington. PSNH was asked to move the design further off the road onto private property owned by residents along Gundalow Landing road. Although PSNH attempted to secure the necessary underground rights to construct the Project outside of Gundalow Landing Road, PSNH does not currently have all of these rights. PSNH continues to work closely with the Town of Newington and abutting landowners to secure the necessary land rights to construct the Project underground in this area. Should PSNH be able to obtain these rights, PSNH will submit an amendment to its Application prior to the commencement of discovery in this proceeding.

In Newington, the transition structures will be placed approximately 1,500 feet from the shoreline, limiting potential visibility from Little Bay. In consultation with the Town, PSNH investigated a relocation of the transition structure. The Town of Newington requested the transition structure, going from the underground cable leaving Gundalow Landing to overhead in the ROW across Little Bay Road, be relocated off the existing ROW onto Town owned property to limit its visibility. However, to incorporate this design change, additional easement rights are required from the Town because the Town is the underlying land owner of this parcel. After continued discussions with the Town, PSNH has been unable to secure all of the necessary rights. PSNH continues to work closely with the Town of Newington to secure the necessary land rights to relocate the transition structure.in this area. Should PSNH be able to obtain these rights, PSNH will submit an amendment to its Application prior to the commencement of discovery in this proceeding.

PSNH also received and considered feedback from the Town and from PSNH's historical resources and aesthetics consultants regarding the location and height of the transmission line structures in the Newington Center Historic District, which resulted in the modification of the overhead structure design. First and foremost, PSNH has decided to remove the existing 34.5 kV distribution line that currently traverses the Newington Historic District and travels across the Frink Farm, which allows the use of fewer and shorter 115 kV structures.

Second, from Little Bay Road to approximately Fox Point Road, PSNH altered its design to use H-frame structures at the request of the Town. Use of the H-frame design allows the Frink Farm to be traversed by only three structures, one at each edge of the farm property and with a single structure in the farm field. The structure in the field was placed behind existing vegetation (trees) to screen it from views from the farm house.

PSNH also confirmed that the Project overhead design, sited as part of Route Variation 1 to the north of the Portsmouth International Airport at Pease, would meet all FAA height requirements that are applicable to utility structures and glide paths for aircraft approaching and leaving the airport. PSNH met with the Federal Aviation Administration to confirm that the overhead design of the project would not interfere with local or federal aviation regulations. The FAA, Air National Guard, and the Pease Development Authority reviewed the proposed Project and its location and confirmed that the Project would not have any effects on air traffic; the FAA also issued a Determination of No Hazard to Air Navigation.[22]

Third, PSNH has also offered to utilize an underground design for the section of the new 115 kV line across the Newington Center Historic District and through the adjoining neighborhood on Hannah Lane assuming the underground rights could be acquired from all the underlying property owners. To utilize an underground design in this area, PSNH required new underground rights because PSNH's existing easements only provide for overhead construction. To date, however, all of the necessary rights for undergrounding the line could not be obtained.

PSNH continues to work closely with the Town of Newington and abutting landowners to secure the necessary land rights to construct the Project underground in this area. Should PSNH be able to obtain these rights and the necessary approvals, PSNH will submit an amendment to its Application prior to the commencement of discovery in this proceeding. This design change can only be accomplished, however, if all of the residents in this area grant the necessary underground rights to PSNH and

[22] The Project will re-submit FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the FAA at least 45 days before commencing construction to address any changes that have been made to original design.

the necessary local, state, and federal approvals are granted in a timely manner.[23]

Finally, a portion of the ROW within Newington crosses the parking lots associated with Crossings at Fox Run Mall. In this area, Eversource optimized its structure design to limit impacts to parking and driving areas and potential disruptions to the surround businesses.

(3) Documentation that the applicant has held at least one public information session in each county where the proposed facility is to be located at least 30 days prior to filing its application, pursuant to RSA 162-H:10, I and Site 201.01;

See Appendix 25 for the Pre-Filing Public Information Sessions Transcripts from Durham, NH (Strafford County) on April 22, 2015 and Newington, NH on April 23, 2015 (Rockingham County) that were held at least 30 days prior to filing the application.

(4) Documentation that written notification of the proposed facility, including copies of the application, has been given to the governing body of each municipality in which the facility is proposed to be located, and that written notification of the application filing, including information regarding means to obtain an electronic or paper version of the application, has been sent by first class mail to the governing body of each of the other affected communities;

The governing body of each municipality where the Project is proposed to be located—as listed below—will be provided with a copy of this concurrently with the filing with the SEC. PSNH will file a copy of the return receipt or other documentation of receipt by each town with the SEC and has reserved Appendix 26 for this purpose.

- Madbury, Board of Selectmen
- Durham, Town Council
- Newington, Board of Selectmen
- Portsmouth, City Council

(5) The information described in Sections 301.04 through 301.09;

See Sections 301.04 through 301.09 below.

[23] The Frink Farm in Newington is currently subject to an agricultural conservation easement. To construct the Project underground, PSNH will also need to seek an amendment of this easement by obtaining the required approvals from the Town of Newington, the Rockingham Conservation District, the United States Department of Agriculture, and the New Hampshire Department of Justice.

(6) For a proposed wind energy facility, information regarding the cumulative impacts of the proposed energy facility on natural, wildlife, habitat, scenic, recreational, historic, and cultural resources, including, with respect to aesthetics, the potential impacts of combined observation, successive observation, and sequential observation of wind energy facilities by the viewer;

The Project is not a wind energy facility; therefore, this section does not apply.

(7) Information describing how the proposed facility will be consistent with the public interest, including the specific criteria set forth in Site 301.16(a)-(j); and

The Project will serve the public interest in New Hampshire by ensuring a reliable and adequate power supply to the Seacoast Region. SRP is a key piece among a suite of projects that are part of what the ISO-NE has identified as the Seacoast Solution. The projects are needed to support the reliable delivery of electric power to meet the Region's current demand and support the Region's future economic growth. SRP will serve the public interest by increasing the reliability of the power supply in the region, providing an increase to the local and State tax base, and by creating job opportunities during the construction phase of the Project.

Based on the ISO-NE Needs Assessment, the Seacoast Region faces significant violations of the transmission system criteria under certain system operating conditions. If these criteria violations are not addressed, the Region will likely encounter system overloads that could lead to power outages for numerous customers. These violations need to be addressed by transmission upgrades to avoid, under certain foreseeable system conditions, risks of equipment damage and line and power outages, and threats to public safety. Additionally, the Seacoast Region's electric demand is growing and is expected to represent approximately 25% of New Hampshire's electric demand by 2020. As demand continues to grow, ISO-NE has determined that additional measures must be implemented to ensure reliable delivery of power.

SRP provides alternate parallel path for the transmission of electricity, which enhances the 115 kV loop that serves the Seacoast Region between the Deerfield and Scobie Pond Substations. See Appendix 27 for a Seacoast Region Transmission Map. By undertaking these necessary upgrades, the reliability of the transmission system will be improved and increase its ability to better withstand system disturbances due to severe weather, equipment failures, and potentially volatile electric market conditions (i.e. unavailability of generation). As a result of SRP, the transmission system will become more robust in its ability to adapt and maintain electric service to customers. SRP, as part of the Seacoast Solution, will provide the least-cost solution to ensure the reliability and operation of the electric system in the region and will thereby serve the public interest.

If no action is taken to address the needs of the electric system in the Seacoast Region there is the potential for transmission lines in the area to exceed their emergency thermal ratings, which may result in degraded voltage. Without the needed additional transmission upgrades, the customers would be at risk of potential load interruption.

In addition to increasing the reliability of the power supply in the region, the Project will invest approximately $77 million in local and State infrastructure and improvements, with an estimated $17.4 million spent with New Hampshire businesses and labor. Based on this investment in infrastructure, the Project will serve the public interest by providing an increase to the county tax base. In its first year of operation, the Project will pay between $1.5 to $2.1 million in total property taxes. This includes $956,000 to $1.4 million to the four host communities of Madbury, Durham, Newington, and Portsmouth for both municipal property taxes and local education property taxes; $157,000 to $173,000 to Strafford and Rockingham Counties, and $460,000 to $562,000 to the State for redistribution to local school districts.

The Project will also serve the public interest by providing additional economic benefits to the State as well as local communities. The Project will create jobs, increase economic output (sales), and increase gross state product (GSP), as well as personal income during the construction phase. During the peak year of construction, the Project is estimated to create between 69 and 123 jobs. The average total number of New Hampshire jobs created annually throughout the Project construction period is estimated to be between 35 to 55. The anticipated employment opportunities created by the Project include direct, local, jobs associated with construction of the Project, as well as indirect and induced employment as a consequence of economic investment in the local community including increases in personal income and local project expenditures.

The estimated employment benefits and economic activity associated with the construction of the Project will serve the public interest by increasing personal income for New Hampshire workers. Personal income in New Hampshire is estimated to increase by a total of $9 million to $13 million on a cumulative basis over the construction period. Annually, the increase will average between $2.2 million and $3.3 million. In addition, during the construction phase, the State's economic output will be approximately $28 million higher, and GSP an estimated $18 million to $19 million higher than they would be in the absence of constructing the proposed Project.

The Project further serves the public interest as it is consistent with the orderly development of the State and towns, limits the impacts on the natural environment as well as historical and cultural resources. It is a sound land use planning practice to construct transmission lines in existing utility rights-of-way.[24] Moreover, the potential adverse effects from the construction and operation of a new transmission line in an existing ROW are limited. Potential environmental impacts, including impacts to the natural environment, natural resources, and air and water quality, are expected to be

[24] "The use of [an] existing right of way is much more consistent with the orderly development of the region and has less impact on the environment." Decision in Portland Natural Gas Transmission System Maritimes & Northeast Pipeline Company, SEC, Docket No. 96-01 and Docket No. 96-03, 1, 17 (July 16th, 1997). In the context of sighting transmission projects, "the single most important fact bearing on this finding [that the facility will not unduly interfere with the orderly development of the region] is that the proposed transmission line occupies or follows existing utility transmission rights-of-way." Findings of the Bulk Power Facility Site Evaluation Committee, SEC DSF 850-155, 1, 11 (Sept. 16th, 1986).

minimal. The Project is not expected to have any significant adverse impact on cultural or historic sites or aesthetics.

Finally, an expert in the field of private property values have also determined that there will not be a discernable adverse impact to property values or marketing times in local or regional real estate markets. The Project will not have an unreasonable adverse effect on public health, whether from the construction of the facility, delivery of materials to the site, EMF or from any other consideration.

Based on the above-discussed factors that are supported by the Pre-Filed Testimony, the Project will not only serve the public interest in the Seacoast region, but also the State of New Hampshire as a whole, its residents, and its businesses.

(8) Pre-Filed Testimony and exhibits supporting the application.

Pre-Filed Testimony of the following persons in support of this application is submitted by the following persons:

1. William Quinlan, addressing: Background information on Applicant and Project development, Project Alternatives, Project Need, and other areas not specifically addressed or supported by other witnesses.
2. Robert Andrew, addressing: Impact on system stability and reliability
3. Michael Ausere, addressing: Financial capabilities of PSNH
4. James Jiottis, addressing: Project alternatives and public health and safety (sound)
5. David Plante, addressing: Technical and Managerial capabilities of PSNH
6. Anthony Troy Godfrey, addressing: Technical and Managerial capabilities of PSNH (submarine cable installation)
7. Lynn Farrington, addressing: Technical and Managerial capabilities of PSNH (traffic management)
8. David Raphael, addressing: The Project's visual impacts (i.e. aesthetics)
9. Cherilyn Widell, addressing: Aboveground historic resources
10. Victoria Bunker, addressing: Archeological resources
11. Sarah Allen, addressing: The Project's impacts on the natural environment
12. Ann Pembroke, addressing: The Project's impacts on the marine environment
13. William Bailey, addressing: Public health and safety (EMF)
14. Robert Varney, addressing: Orderly regional development and tourism
15. James Chalmers, addressing: Local Property Values
16. Lisa Shapiro, addressing: Local Economy, local employment, and tax revenues

Site 301.04 Financial, Technical and Managerial Capability.

Each application shall include a detailed description of the applicant's financial, technical, and managerial capability to construct and operate the proposed energy facility.

Based on the following discussion, coupled with the Pre-Filed Testimony of Michael Ausere, David Plante, James Jiottis, Anthony Troy Godfrey, and Lynn Farrington and the supporting appendices, PSNH has the financial, technical, and managerial capability to construct and operate the Project, in continuing compliance with the terms and conditions of the Certificate of Site and Facility.

(a) Financial information shall include:

(1) A description of the applicant's experience financing other energy facilities;

PSNH is a wholly-owned utility subsidiary of Eversource Energy (formally Northeast Utilities), which engages in electric and gas delivery to businesses and residences throughout the northeast. PSNH's business consists primarily of the generation, delivery and sale of electricity to its residential, commercial and industrial customers. It also owns and operates approximately 1,200 MW of primarily fossil-fueled electricity generation plants. PSNH's distribution and generation segments are subject to regulation by the NHPUC, which has jurisdiction over rates, certain dispositions of property and plant, mergers and consolidations, issuances of securities, standards of service and construction and operation of facilities. PSNH's transmission facilities that are part of an interstate power transmission grid over which electricity is transmitted throughout New England that are regulated by the Federal Energy Regulatory Commission ("FERC").

PSNH has a proven track record of financing large energy projects such as SRP. Over the three years ended December 31, 2015, PSNH invested $750 million in new energy infrastructure. It financed these investments with a combination of internally generated cash flows, long- and short- debt issuances and capital contributions from Eversource. PSNH has corporate credit ratings of A (stable), Baa1 (positive), and BBB+ (positive) from Standard & Poor's, Moody's and Fitch respectively.

Eversource is listed as number 367 on the 2015 Fortune 500 list of largest U.S. companies with an equity market capitalization of approximately $16 billion. Eversource's equity trades on the New York Stock Exchange. Eversource has corporate credit ratings of A, Baa1 and BBB+ from S&P, Moody's, and Fitch's, respectively. Eversource is the highest ranked U.S. utility holding company by S&P.

See Sections 301.03 (b)(5) and Appendix 28 for a copy of the most recently audited balance sheets for PSNH and Eversource.

(2) A description of the corporate structure of the applicant, including a chart showing the direct and indirect ownership of the applicant;

PSNH is a wholly-owned utility subsidiary of Eversource Energy. See Corporate Organizational Chart, Appendix 29 for a chart depicting the direct and indirect ownership of PSNH and its relationship to Eversource Energy.

(3) A description of the applicant's financing plan for the proposed facility, including the amounts and sources of funds required for the construction and operation of the proposed facility;

The cost of the Project is estimated to be approximately $77 million. PSNH initially finances construction projects with internally generated cash and short-term borrowings from Eversource. As short-term debt accumulates, it is refinanced with long-term debt issued in the credit markets. While PSNH expects that most of its future funding needs will come from a combination of internally generated funds from operations and long-and short-term debt issuances, PSNH also, from time to time, receives capital contributions from its parent, Eversource. These capital contributions allow PSNH to maintain an appropriate level of common equity to total capitalization, which helps ensure that PSNH will maintain its strong credit ratings that allow ongoing access to the capital markets at favorable rates.

The funds for the operation and maintenance ("O&M") of the Applicant's electric transmission assets are budgeted on a system wide level, not on a circuit or line level. Thus, the Applicant cannot provide the amount of O&M funds required for the Project once in-service. However, that amount will not be significant since the line is located in an existing right-of-way that is already being maintained on a regular cycle. The Applicant will fund the cost of O&M by internally generated funds, debt, and equity.

(4) An explanation of how the applicant's financing plan compares with financing plans employed by the applicant or its affiliates, or, if no such plans have been employed by the applicant or its affiliates, then by unaffiliated project developers if and to the extent such information is publicly available, for energy facilities that are similar in size and type to the proposed facility, including any increased risks or costs associated with the applicant's financing plan; and

PSNH will finance this Project as it historically has financed similar transmission projects, which is thoroughly described in Section 301.04 (a)(1) and (a)(2). Please also see the Pre-Filed Testimony of Michael Ausere.

(5) Current and pro forma statements of assets and liabilities of the applicant;

PSNH's and Eversource's most recent audited Balance Sheets for the two years ending December 2015 and unaudited pro forma balance sheet ending December 2015 are attached hereto as Appendix 30.

(b) Technical information shall include:

(1) A description of the applicant's qualifications and experience in constructing and operating energy facilities, including projects similar to the proposed facility; and

Eversource operates New England's largest utility system serving more than 3.6 million electric and natural gas customers across Connecticut, Massachusetts, and New Hampshire. Eversource owns and operates approximately 4,270 circuit miles of transmission lines, 72,000 pole miles of distribution lines, 578 transmission and distribution stations, and 450,000 distribution transformers. PSNH and its predecessor companies have owned, operated and maintained transmission facilities in New Hampshire for over one hundred years. PSNH is responsible for operating approximately 780 circuit miles of 115 kV, 8 miles of 230 kV and 252 miles of 345 kV transmission lines and about 204 active transmission and distribution substations. Appendix 31 is a map of the service territory of Eversource and its subsidiary companies.

Eversource is a leading expert in building, owning and operating transmission facilities and is an Edison Award recipient for transmission ownership and providing service. Eversource is a transmission owner with approximately $4.5 billion in transmission rate base and has placed over $4.2 billion in service since 2006.

Eversource is currently enhancing the reliability of the electric grid with a number of significant construction projects involving high-voltage transmission lines in Connecticut, Massachusetts and New Hampshire. Eversource's electric transmission investment over the next five years is projected to be approximately $4.3 billion.

PSNH and Eversource have constructed and now operate many projects similar to SRP. A few examples include:

a. Y138 Transmission Line Project

PSNH's 115 kV Y138 Line project included the construction of 14 miles of new 115 kV line between the White Lake substation in Tamworth, NH and the Saco Valley substation in Conway, NH. Project included upgrades at both substations. The project required siting approval by the SEC and was completed in 1993.

b. J125 Transmission Line Project

PSNH's 115 kV J125 project included the construction of 13.7 miles of new 115 kV line between the Webster substation in Franklin, NH and the Laconia substation in Laconia, NH. This project involved complex double circuit construction with existing 34.5 kV lines that required minimizing outage durations during construction. The project included upgrades at both substations and a 34.5 kV submarine cable 0.2 miles in length in Lake Winnisquam. Total cost of the project was $6.3 million and it was completed in 2002.

c. Y170 Transmission Line Project

PSNH's 115 kV Y170 Line project included the construction of 7 miles of new 115 kV double circuit line (with the relocation of the existing 34.5 kV distribution line), from the Eastport substation in Rochester, NH to the new Tasker Farm distribution substation in Milton, NH. Challenges included a substantial amount of wetland construction and difficult construction access. Total cost of the project was $10.5 million and it was completed in 2014.

d. Eversource Long Island Replacement Cable Project

PSNH's affiliate, Connecticut Light and Power ("CL&P") worked with Long Island Power Authority to design, construct and operate an 11 mile 138 kV electric cable between Connecticut and Long Island. CL&P's investment in this project was approximately $79 million and was completed in 2008.

e. NSTAR Falmouth to Martha's Vineyard Cable Project

In Massachusetts, PSNH's affiliate, NSTAR, partnered with Comcast to install 4 miles of 23 kV electric and fiber optic submarine cable from Falmouth to Martha's Vineyard. NSTAR's investment in the submarine portion of the project was approximately $17 million and was completed in 2014.

Consequently, PSNH has the necessary resources and experience to design, construct, operate, maintain, and repair the Project.

(2) A description of the experience and qualifications of any contractors or consultants engaged or to be engaged by the applicant to provide technical support for the construction and operation of the proposed facility, if known at the time of application;

PSNH engages contractors and consultants with the experience and qualifications to engineer, construct and perform various Project requirements as well as provide the appropriate oversight for the Project. There are specific procurement procedures to competitively bid the consulting and construction to experienced and qualified participants. Once the design is complete, PSNH will proceed with the several procurement events to address the various components of the Project. Bidders are provided with a Request for Information ("RFI") which focuses on a number of keys areas, such as financial stability, company overview, experience, safety and other items that are specific to the particular bid event.

PSNH has already engaged Power Engineers ("Power") to provide technical support for the design and construction of the Project. Power is a consulting services and engineering firm with extensive knowledge and experience in the design and construction of high voltage transmission lines. Their project portfolio extends internationally and includes a diverse range of energy delivery projects for both the distribution and transmission projects. In 2009, Power won the Edison Award for their work on the Arrowhead-Weston 345 kV transmission line in Wisconsin for a 220-mile 345 kV transmission line designed to relieve transmission constraints and

improve the reliability in northwestern Wisconsin. Other notable overhead transmission projects that Power has completed or is currently working on include a more than 725 mile, 600 kV HVDC transmission line crossing multiple western states as well as a regional high-voltage transmission network upgrade program involving 345 kV and 115 kV facilities in Massachusetts and Rhode Island.

Power also has substantial experience with the design and support of underground transmission lines. Power provided engineering and design services to support the route selection, permitting, licensing and installation of an underground, 3.4 mile, 115 kV electric transmission line between the Vernon Hill and Bloomingdale substations in Worcester, MA.

PSNH has also engaged Leidos Engineering ("Leidos") to be the contractor on the two substations that require upgrades and additions. Leidos is an award-winning engineering firm with specialized expertise in the electric utility industry. Leidos has extensive experience resolving a range of issues associated with operating an electric grid including aging equipment, evolving technology, increased capacity requirements, facility expansion, and the need for real-time communication, monitoring, and protection and control of substations. In this pursuit, Leidos services include, but are not limited to, energy management and efficiency, smart grid technologies, utility planning and consulting, and power grid engineering.

Leidos has extensive knowledge and experience working on substation engineering and design. Specifically, Leidos has worked on over three-hundred substation, distribution, and transmission line projects. Leidos has worked with Eversource since 2000 and is conducting ongoing work with Eversource on a number of transmission line design and substation improvements. Substation improvements include the addition of synchronous condenser, protective relay replacements, and circuit breaker replacements. Transmission line work improvements include evaluating and upgrading the transmission system for North American Electric Reliability Corporation ("NERC") compliance.

(c) Managerial information shall include:

(1) A description of the applicant's management structure for the construction and operation of the proposed facility, including an organizational chart for the applicant;

To support the construction of the Project, the Applicant's management structure will include the project manager, construction manager, safety specialist, environmental monitor and community relations representative. Field staff at each location will be responsible for general oversight and monitoring. The field staff includes, but is not limited to, construction superintendents, construction inspectors, environmental monitor, surveyors, safety specialists and community relations operatives. Office staff includes finance and accounting, scheduling, procurement, legal and siting and permitting. For a complete discussion of the Applicant's management structure during construction, please see the Pre-Filed Testimony of David Plante. See also Appendix 20 for the Organizational Chart for Construction, an Organizational Chart

for Operation, and the management structure of the operation of the proposed facility.

(2) A description of the qualifications of the applicant and its executive personnel to manage the construction and operation of the proposed facility; and

For a description of the qualifications of PSNH to manage the construction and operation of the Project, see section 301.04(b)(1). Eversource has extensive experience managing and operating the largest electric utility system in New England.

For a description of the qualifications key PSNH personnel, please see Pre-Filed Testimony and resumes of David L. Plante, Manager of Transmission Project Management, and James J. Jiottis, Project Manager - Siting.

For a description of the qualifications of the Applicant's executive personnel, please see Pre-Filed Testimony and resume of William J. Quinlan. Mr. Quinlan, as the CEO of PSNH, will is the executive in charge of overseeing and managing the construction and operation of the proposed facility.

(3) To the extent the applicant plans to rely on contractors or consultants for the construction and operation of the proposed facility, a description of the experience and qualifications of the contractors and consultants, if known at the time of application.

No construction contractors or consultants have been identified at the time of application. PSNH engages contractors and consultants with the experience and qualifications to provide the appropriate oversight for the Project. There are specific procurement procedures to competitively bid the consulting and construction to experienced and qualified participants. Once the design is complete, PSNH will proceed with the several procurement events to address the various components of this project. Bidders are provided with a Request for Information ("RFI") which focuses on a number of keys areas, such as financial stability, company overview, experience, safety and other items that are specific to the particular bid event.

(d) Summary

Based on the foregoing discussion, as supported by the Pre-Filed Testimonies of Michael Ausere, Dave Plante, James Jiottis, Lynn Farrington, and Anthony Troy Godfrey the Applicants have adequate financial, technical, and managerial capability to assure construction and operation of the facility in continuing compliance with any terms and conditions contained in a Certificate of Site and Facility.

Site 301.05 Effects on Aesthetics.

(a) Each application shall include a visual impact assessment of the proposed energy facility, prepared in a manner consistent with generally accepted professional standards by a professional trained or having experience in visual impact

assessment procedures, regarding the effects of, and plans for avoiding, minimizing, or mitigating potential adverse effects of, the proposed facility on aesthetics.

Eversource engaged LandWorks, an outside firm specializing in evaluating aesthetic impacts for proposed projects, to perform a Visual Assessment ("VA") for the Project. A copy of the completed VA can be found at Appendix 32.

For the purpose of the VA, the geographic scope, or study area, has been delineated as a 10-mile linear corridor on either side of the Project's center line, for an overall 20-mile corridor. The study area runs parallel to the utility corridor and contains approximately 361 square miles through 20 towns, 4 of which are where the Project will be physically located. The predominant topographic landscape within the study area is elevations less than 500 feet, and contains generally flat tidal marshes, wetlands, river valleys, and rocky shores. From a visual perspective, the landscape supports remnant woodlands and agricultural fields, interspersed with developed areas, open marshes and river corridors. This area does not provide dramatic or striking landscape views, such as portions of the Mount Washington Valley or the Champlain Valley in Vermont, where long distant and panoramic views of prominent features are visible from wide-open roadsides and numerous vantage points. Overall, the study area has a dense network of local, state, and federal routes compared to areas further north in New Hampshire, and also a greater overall development density--more settled towns and developed areas within it. It is a suburban landscape that alternates with remnant woodlands and agricultural open spaces, particularly within the river valley and environs.

The multi-step evaluation methodology presented in the VA is an amalgamation of a number of established processes, as well as decades of professional experience in this industry, and provides an objective, comprehensive analysis. It is a thorough approach and screening process that helps to determine: 1) scenic resources within the study area, 2) the sensitivity of a scenic resource, 3) the visual change the Project may have to that sensitive resource, 4) the effect the visibility may have on the typical viewer, and 5) an overall conclusion on whether the Project has an unreasonable adverse effect on aesthetics given the visual change.

Only documented national, state, and local recreational and scenic resources that are readily accessible to the public are reviewed in this analysis. Scenic resources were identified on a town-by-town basis through a consistent and systematic process including, but not limited to, review of available GIS data, published maps and guidebooks, online research, and town and regional plans. The Project is located within the state's Seacoast tourism region, where most of the visitor activities and attractions are focused on the historic port city of Portsmouth and the shoreline of the Atlantic Ocean.

The comprehensive inventory of scenic resources found several resources of national importance within the study area, such as Spruce Hole Bog or the Lamprey River, but most do not have visibility of the Project. Only Great Bay National Wildlife Refuge has the potential to see the Project, but the visual effect would be insignificant given the distance, tree cover, and only the top of the structures (no conductors) are visible. Within the 361 square mile Project Study Area, only 30 scenic resources have the potential for visibility. Of those 29, only 9 of those are considered visually sensitive. Primary Project visibility from

scenic resources is limited to several local roads and a few local and regional viewpoints. Additionally, the average viewing distance of all resources with potential visibility will be 0.9 or more miles, and 1.75 or more miles for the 9 sensitive resources.

The visual sensitivity of the 30 identified scenic resources with potential visibility is determined by evaluating each resource's 1) *cultural designation* - how a resource has been valued by the public through official designation, and 2) *scenic quality* - the character and features of a resource that make it scenic. For *cultural designation*, each resource is given a rating of low, moderate or high based on the local, regional, statewide or national cultural significance of a particular resource, often indicated by formal designation, ownership or inclusion in a current or recent community (or official) planning document that recognizes its cultural, natural resource, recreational, or scenic value. A *scenic quality* rating of low, moderate or high is also given to each resource by using the Bureau of Land Management (BLM) Scenic Inventory and Evaluation Chart, which considers seven criteria - landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. The two ratings (cultural designation and scenic quality) are then combined to obtain an overall sensitivity rating. Those resources with an overall rating of 'Moderate-High' or 'High' continue to the next step in the screening process. Of the 30 scenic resources identified as having potential visibility, 9 have a visual sensitivity rating of 'Moderate-High' or 'High' and therefore move forward to the next step of the assessment process.

The next step determines the visual effect a project may have on the 9 sensitive scenic resources. Visual effect is determined by scoring each sensitive resource under each of the following categories to establish a combined overall rating of low, moderate or high:

1. *Scale and spatial presence* – is the project a dominant element in the view
2. *Prominence* – does the project stand out and draw attention
3. *Compatibility* – is the project consistent or inconsistent with the built or natural elements currently visible in the landscape

The three scores for each resource were then combined to determine the overall visual effect the Project may have on the resource. Those resources with an overall rating of 'Moderate-High' or 'High' continue to the next step in the screening process, viewer effect. Only 1 of the 9 sensitive scenic resources result in an overall rating of 'Moderate-High', Little Bay Road. Note that this rating does not necessarily translate into high viewer effect, which is covered in the next step of the analysis process, nor does this determination imply that there will necessarily be a substantive visual impact if the Project is built. That conclusion comes at the end of the analysis process.

The LandWorks VA also includes a detailed assessment for determining what the Project's effect will be on the typical viewer from a scenic resource with higher visual effect. This is considered to be the "viewer effect" as articulated in the methodology. The considerations used in the analysis are well established in both the BLM VRM and the USFS SMS, as well as the USFS Recreation Opportunity Spectrum ("ROS"). This last piece of the screening process indicates that the effect to a typical viewer visiting Little Bay Road would be low-moderate.

The final piece of the VA provides an overall summary and LandWorks' professional opinion as to whether the Project, as proposed, will have an unreasonable, adverse effect on aesthetics. Incorporated into the results of the foregoing evaluation are a number of other relevant factors, including:

- The Project Corridor and Study Area Characteristics - The transmission Project is reasonably scaled and located in this corridor and the overall Project area, and this is based on: 1) existing topography (flat, level terrain), vegetation and intervening structures in the Project area limit overall visibility of the Project; 2) placement within an existing PSNH utility corridor with existing distribution and transmission lines requires limited adjustments and clearing; 3) the Project area is urban, highly developed and the scale of the Project is consistent with existing land use patterns; and, 4) utility corridors are already present throughout the Project area and, as a result, the area is less sensitive to a new transmission line.
- Local Conditions - Detailed analyses and several site visits to all 30 identified resources with potential visibility confirmed that most of these destinations have limited, insignificant, or unnoticeable views. Users are less likely to be aware of the Project given the developed and urban nature of portions of the Project area coupled with the flat terrain and extensive woodland areas and existing vegetation. Given these factors, the typical viewer will not be deterred by Project visibility in making their recreational choices or in going about their everyday lives. The use of a utility corridor in this landscape will not undermine the quality of the resources or the viewer experience. Furthermore, Project visibility is limited to crossing points on local roads and state highways, such as New Market Road in Durham, and a few open areas like parking lots and cleared meadows. The Project will not be visible from most other roads, town centers, cities and other areas where human activity is predominant within the study area.
- Efficacy of Mitigation – Taken together, the number of mitigation measures that the Project has incorporated or proposed represent a substantial effort to effectively reduce the overall visibility of the Project, including but not limited to: co-location within an existing PSNH utility corridor; the selection of structure heights, types, and placements to reduce visual presence; the undergrounding of the line in sensitive locations like the UNH Durham campus at the Main Street crossing; the reduction of poles heights in Madbury and Durham; the use of H-frame structures in Newington at the Nimble Hill Road crossing and the relocation of the 34.5 kV line in Newington; purchasing property on the west shore of Little Bay so the cable can be buried as it comes ashore; retaining vegetative buffers at road crossings and continuing to utilize selective vegetative management methods; and the placement of the new transmission line under the waters of Little Bay and the transition structure where the cable transitions back to an overhead line off shore on the east side of Little Bay.

LandWorks has determined that, from a visual assessment perspective, the Project area is an appropriate location and corridor for the new transmission Project. The visual effects are extraordinarily limited given the densely settled nature of the Project area and the number of roads, town centers, rivers, and resources within the area. The regional vantage points that typically have views of the proposed Project are experienced within a much broader context and quite distant from the Project itself, therefore diminishing any potential

objectionable visual effects. In light of the comprehensive analysis described in the VA, LandWorks concluded that the Project will not have an unreasonable adverse effect on the aesthetics.

(b) The visual impact assessment shall contain the following components:

(1) A description and map depicting the locations of the proposed facility and all associated buildings, structures, roads, and other ancillary components, and all areas to be cleared and graded, that would be visible from any scenic resources, based on both bare ground conditions using topographic screening only and with consideration of screening by vegetation or other factors;

See response to section (3)(a) above. See also Appendix 32 Visual Assessment, in particular Section 2 page 11 and Section 3 page 31 and Exhibits 1 and 2.

(2) A description of how the applicant identified and evaluated the scenic quality of the landscape and potential visual impacts;

See response to section (3)(a) above. See also Appendix 32 Visual Assessment, in particular Section 2 page 15-25.

(3) A narrative and graphic description, including maps and photographs, of the physiographic, historical and cultural features of the landscape surrounding the proposed facility to provide the context for evaluating any visual impacts;

See response to section (3)(a) above. See also Appendix 32 Visual Assessment, Section 3 in particular page 32-42.

(4) A computer-based visibility analysis to determine the area of potential visual impact, which, for proposed:

a. Wind energy systems shall extend to a minimum of a 10-mile radius from each wind turbine in the proposed facility;

b. Electric transmission lines longer than 1 mile shall extend to a 1/2 mile radius if located within any urbanized area;

c. Electric transmission lines longer than 1 mile shall extend to a 2 mile radius if located within any urban cluster;

d. Electric transmission lines longer than 1 mile if located within any rural area shall extend to:

1. **A radius of 3 miles if the line would be located within an existing transmission corridor and neither the width of the corridor nor the height of any towers, poles, or other supporting structures would be increased; or**
2. **A radius of 10 miles if the line would be located in a new transmission corridor or in an existing transmission corridor if either or both the width of the corridor or the height of the towers, poles, or other supporting structures would be increased;**

A computer-based visibility analysis, or viewshed analysis, was conducted within a 10-mile radius of all proposed project structures. See Appendix 32 Visual Assessment, in particular Section 2.D.1, page 11 of LandWorks' report for more detailed information on viewshed mapping and viewshed analyses. See also Exhibits 1 and 2 of Appendix 32 Visual Assessment for viewshed maps.

(5) An identification of all scenic resources within the area of potential visual impact and a description of those scenic resources from which the proposed facility would be visible;

See response to section (3)(a) above. See also Appendix 32 Visual Assessment, in particular Section 4 page 43-79.

(6) A characterization of the potential visual impacts of the proposed facility, and of any visible plume that would emanate from the proposed facility, on identified scenic resources as high, medium, or low, based on consideration of the following factors:

- **a. The expectations of the typical viewer;**
- **b. The effect on future use and enjoyment of the scenic resource;**
- **c. The extent of the proposed facility, including all structures and disturbed areas, visible from the scenic resource;**
- **d. The distance of the proposed facility from the scenic resource;**
- **e. The horizontal breadth or visual arc of the visible elements of the proposed facility;**
- **f. The scale, elevation, and nature of the proposed facility relative to surrounding topography and existing structures;**
- **g. The duration and direction of the typical view of elements of the proposed facility; and**
- **h. The presence of intervening topography between the scenic resource and elements of the proposed facility;**

See response to section 3.a above. See also Appendix 32 Visual Assessment, in particular Section 4 page 79-88.

(7) Photosimulations from representative key observation points, from other scenic resources for which the potential visual impacts are characterized as "high" pursuant to (6) above, and, to the extent feasible, from a sample of private property observation points within the area of potential visual impact, to illustrate the potential change in the landscape that would result from construction of the proposed facility and associated infrastructure, including land clearing and grading and road construction, and from any visible plume that would emanate from the proposed facility;

Photosimulations were prepared for resources rated with a moderate-high or high sensitivity, which had the potential to be significantly affected by the visual change that could result if the Project is constructed and additional analyses are necessary.

Photosimulations were also prepared from a sample of private property observation points within the area of potential visual impact.

Photosimulations represent one or more of the following features: 1) a point within an area of the resource identified by the viewshed analysis that has the highest range of structures potentially visible, 2) a point where the highest amount of use is anticipated from the resource, or 3) a point where access to the resource is most easily or likely achieved. See response to section 3.a above. See also Appendix 32 Visual Assessment, Exhibits 3-18.

(8) Photosimulations shall meet the following additional requirements:

a. Photographs used in the simulation shall be taken at high resolution and contrast, using a full frame digital camera with a 50 millimeter fixed focal length lens or digital equivalent that creates an angle of view that closely matches human visual perception, under clear weather conditions and at a time of day that provides optimal clarity and contrast, and shall avoid if feasible showing any utility poles, fences, walls, trees, shrubs, foliage, and other foreground objects and obstructions;

b. Photosimulations shall be printed at high resolution at 15.3 inches by 10.2 inches, or 390 millimeters by 260 millimeters;

c. At least one set of photosimulations shall represent winter season conditions without the presence of foliage typical of other seasons;

d. Field conditions in which a viewpoint is photographed shall be recorded including:

1. Global Position System (GPS) location points with an accuracy of at least 3 meters for each simulation viewpoint to ensure repeatability;

2. Camera make and model and lens focal length;

3. All camera settings at the time the photograph is taken; and

4. Date, time and weather conditions at the time the photograph is taken;

Photosimulations represented in Appendix 32 Visual Assessment follow the requirements outlined herein. See Appendix 32 Visual Assessment, Exhibits 3-18.

e. When simulating the presence of proposed wind turbines, the following shall apply:

Not Applicable.

(9) If the proposed facility is required by Federal Aviation Administration regulations to install aircraft warning lighting or if the proposed facility would include other nighttime lighting, a description and characterization of the potential visual impacts of this lighting, including the number of lights visible and their distance from key observation points; and

The Project is not required to install aircraft warning lighting nor will the Project include other nighttime lighting.

(10) A description of the measures planned to avoid, minimize, or mitigate potential adverse effects of the proposed facility, and of any visible plume that would emanate from the proposed facility, and the alternative measures considered but rejected by the applicant.

A number of measures have been employed to avoid, minimize, or mitigate potential impacts to aesthetics and these measures resulted from discussions with the towns and historic resource experts in combination with input from the Project's aesthetic experts. These measures include:

- The co-location of the new transmission line in an existing corridor, coupled with the use of existing substations, is a key mitigation measure, as it eliminates the need for a totally new corridor and the related visual, environmental and financial effects and costs.
- The placement of the line under the waters of Little Bay and the transition structures on both sides of the Bay minimize visual effect and avoid any impacts to users of the waterway.
- The selection of structure types, heights, placements, and material to reduce visual presence in several locations along the corridor.
- The undergrounding of the Project to address public concerns regarding visibility are substantive avoidance measures that will eliminate any visibility in that area.
- The retention of vegetative buffers, wherever possible, to provide screening at road crossings and minimize visibility.
- Conducting post construction review with private property owners, as applicable, to mitigate visibility.

See the Pre-Filed Testimony of David Raphael for further discussion on the measures taken by the Applicant to avoid, minimize, and mitigate potential adverse impacts to aesthetics.

(c) Summary

Based on the foregoing discussion, as supported by the Pre-Filed Testimony of David Raphael, the Project will not have an unreasonable adverse effect on aesthetics.

Site 301.06 Effects on Historic Sites.

Each application shall include the following information regarding the identification of historic sites and plans for avoiding, minimizing, or mitigating potential adverse effects of, the proposed energy facility on historic sites:

(a) Demonstration that project review of the proposed facility has been initiated for purposes of compliance with Section 106 of the National Historic Preservation Act, 54 U.S.C. §306108, or RSA 227-C:9, as applicable;

PSNH initially submitted a Request for Project Review ("RPR") with NHDHR on March 4, 2015. NHDHR responded with comments on the RPR on March 19, 2015. On March 20, 2015, PSNH filed a Section 106 Request for Permit Area Determination with the United States Army Corps of Engineers ("USACE"). The USACE issued permit area determination letters on May 4, 2015, September 15, 2015, March 10, 2016 and March 29, 2016.

See section 301.06(e) below for additional information about consultations with NHDHR and the USACE.

(b) Identification of all historic sites and areas of potential archaeological sensitivity located within the area of potential effects, as defined in 36 C.F.R. §800.16(d);

(1) Historic Sites

The Applicant has completed a NHDHR PAF that identifies all historic sites in the APE. As noted below there are some 162 individual properties or areas/districts that may meet the 50 year age-eligibility criterion for listing on the National Register. The vast majority of the properties are not in view of the Project. Others no longer retain integrity or do not have historical significance that derives from setting, landscape, and viewshed.

a. Seacoast Reliability Project Preliminary Report: Historic Resources (February 2015)

The Project first prepared the preliminary report written by Archaeological and Historical Services, Inc. (AHS) entitled *Seacoast Reliability Project Preliminary Report: Historic Resources* dated February 13, 2015. See Appendix 11. This report identified historic resources in preparation for filing the RPR with NHDHR on behalf of the Applicant. As part of this review, AHS conducted a file check at NHDHR in November 2013 to gather information on already-identified historic resources and conducted on-site survey. Both the previously identified historic resources and those identified through the field survey were identified and photographed.

b. Project Area Form (January 2016 and updated April 2016)

Using a study area that includes the electric utility corridor and a one-half mile area on both sides of the corridor, a PAF was completed by Preservation Company in January 2016. It has been submitted to NHDHR as part of the SEC application and also for the National Historic Preservation Act Section 106 review process. The PAF describes the historic, geographic and architectural contexts that will be used to evaluate historic resources potentially affected by the Project. The PAF identifies all historic sites within the APE that meet the 50 year age-eligibility criterion for listing on the National Register, totaling 162 resources. The PAF specifically identifies those resources (individual properties and areas/districts) recommended for further survey that are age-eligible, retain integrity, have actual visibility of the Project and have historical significance that derives from setting, landscape or viewshed. See Appendix 10.

The Applicant's assessment of above ground historic resources began with a comprehensive review of previous documentation in NHDHR files for the APE for above ground historic resources. The extensive previous documentation included National Register listings, NHDHR individual, project area and town-wide area forms, planning surveys, town master plans, state and Historic American Buildings Survey/Historic American Engineering Record ("HABS/HAER") documentation and historic structures reports. Preservation Company conducted extensive field survey and, photographed, mapped and catalogued all identified and previously unidentified properties in the APE that were constructed prior to 1968.[25] In the field, viewshed mapping along with actual sight analysis was used to preliminarily assess the properties' historic settings and their visual relation to the Project. Further refinement of viewshed findings was done using aerial mapping (Google Maps, Bing Maps), Google Street View (where available), Google Ground-level View (which models the topography of a given area) and visual simulations produced by LandWorks, the Project's visual consultant. Other sources consulted were town tax assessments and tax maps, historic USGS maps and aerials. UNH campus maps and materials from the UNH website and building history from the UNH Special Collections and Archives provided identification of University-owned buildings and land.

The list of historical sites (individual properties and historic districts) identified by the Project is set forth on pages 99-120 in the PAF. The list includes 13 resources in Madbury, 55 in Durham, 84 in Newington and 10 in Portsmouth. Some of these resources were previously listed on or determined eligible for listing on the National Register.

[25] In residential subdivisions only representative resources were photographed. Parcel boundaries for each pre-1968 property in the APE were also mapped on KMZ maps to aid in understanding the relationship of the property associated with the historic resources and project.

Resources in the APE listed on the National Register include the Newington Center Historic District (listed 1987, boundaries expanded 1991) and Thompson Hall at UNH in Durham (listed 1996).

Resources in the APE that have been determined eligible for the National Register include: Boston and Maine Western Division Railroad Historic District in both Madbury and Durham (1993), William H. Elliott Rose Company Historic District in Madbury (2000), Newmarket and Bennett Roads Farms Historic District in Durham (2010), Morrill Hall at UNH in Durham (DUR0009-1992), Benjamin S. Hoyt House and Barn in Newington (NWN0148- 2004/5), John Downing House and Barn in Newington (NWN0201-2004/5), Portsmouth Water Department Auxiliary Pumping Station in Newington (NWN0228-2004/5), Isaac Dow House in Newington (NWN0205-2004/5) and Beane Farm also in Newington (NWN0204- 2004/5). Many other properties and historic areas within the APE have been surveyed and determined not eligible for the National Register.

All previously documented historic resources and newly identified potential historic resources more than 50 years old are shown on the Project Maps.

(2) Archeological Resources

The Applicant has completed Phase I-A survey reports in support of this Application as follows:

- *Phase I-A Preliminary Archeological Survey, Seacoast Reliability Project, Madbury, Durham, Newington and Portsmouth, NH* (April 2015);
- *Phase I-A Preliminary Archeological Survey, Seacoast Reliability Project, Access Roads and Corridor Adjustments, Madbury, Durham, Newington and Portsmouth, NH* (Addendum, January 2016);
- *Phase I-A Preliminary Archeological Survey, Seacoast Reliability Project, Underground Route and ROW Shift, Durham, and Newington, NH* (Addendum, January 2016); and
- *Phase I-A Preliminary Archeological Survey, Seacoast Reliability Project, Underground Route Shift, Durham, NH* (Addendum, December 2015).

The initial Phase I-A report was submitted to and approved by NHDHR in early 2015. The report addenda are being submitted with this Application. Together, these reports identify all areas of archeological sensitivity for the Project.

The Phase I-A survey indicates that there are 22 areas of archeological sensitivity in Durham, which include two recorded sites and one cemetery. There are eight areas of archeological sensitivity in Newington, which include one cemetery. There are no areas of archeological sensitivity in Madbury and Portsmouth.

SRP also identified known archeological sites and graveyards on abutting properties. They are listed in Appendix 9 to this Application.[26]

(c) Finding or determination by the division of historical resources of the department of cultural resources and, if applicable, the lead federal agency, that no historic properties would be affected, that there would be no adverse effects, or that there would be adverse effects to historic properties, if such a finding or determination has been made prior to the time of application.

NHDHR has concurred in the recommendations of the initial Phase I-A Archeological Survey for the Project and Addenda that identify archeologically sensitive areas. At this point in the SEC and Section 106 process, neither NHDHR nor the lead federal agency, USACE, have made a determination as to whether the Project will have adverse effects on historic properties.

(d) Description of the measures planned to avoid, minimize, or mitigate potential adverse effects on historic sites and archaeological resources, and the alternative measures considered but rejected by the applicant; and

(1) Historic Sites

The Applicant has taken substantial meaningful measures to avoid, minimize and mitigate potential adverse effects of the Project on historic resources. The design engineers have considered input from the host communities and residents and the Project's historical resources experts, and revised the design of the transmission line to address potential effects on historic resources. As described below and in other sections of this Application, the Project made numerous design changes, including underground construction, structure placement, and structure configuration. For example, the Project has acquired land rights and has contracted to acquire additional easements parallel to the Boston & Maine Railroad Western Division allowing structure heights to be lowered to or below tree height and reducing the number of new structures in the area near the UNH campus. Also, between UNH A Lot to south of the intersection of Colovos Road and Waterworks Road, the Project will be placed underground. This will minimize the impact to the 1936 Main Street Bridge, the ca. 1911-12 Library Way Railroad Underpass, and the B&M Depot.

The Project passes directly through the Newmarket and Bennett Roads Farms Historic District. Project design near the crossing of Route 108 has been modified to reduce visual effects in this area. The monopole configuration that was originally planned was modified to use H-frame, horizontal construction with the new 115 kV line arranged horizontally and the distribution line underbuilt using spacer cable construction. This configuration allowed significantly reduced structure heights (50 feet to 79 feet as compared to 90 feet to 108 feet), and enabled longer spans and shorter heights that could be placed behind vegetation buffers. Other changes to avoid or minimize visual effects include moving a structure on the east side of Route

[26] All Phase I-A reports and Appendix 9 are confidential, and are marked as such under RSA 227-C:11.

108 approximately 50 feet east of the existing distribution line to limit the view from the Mooney Cemetery on Longmarsh Road and lowering one structure on the west side of Route 108 so it is below surrounding trees.

Construction constraints require that the Cable Terminal House in Durham be removed during the Project's construction. The Project has explored options for relocating this building. Selecting the best practicable measures to minimize impact to the building and determining whether the impact can be minimized sufficiently to avoid an adverse effect will be done in the Section 106 review process.

At the Pickering Farm located at 339 Little Bay Road in Newington, the Project has been modified to use H-frame structures, resulting in shorter structures and longer span lengths to limit the number of structures that would be visible. As a result, it was possible to place two structures behind tree cover on either side of the property. The middle structure was positioned approximately 70 feet west of the location of the existing structure to place it as close as possible to existing vegetation and minimize its presence in the view of the of Pickering Farm from Little Bay Road. To reduce existing electric lines in view, PSNH will remove the existing distribution line in the ROW. Weathering steel structures will be used to minimize visual effects and visual contrast with the trees in the back of the field.

In the area of the Newington Center Historic District and the Frink Farm located within the district, it was initially proposed that both the new and existing lines would be carried on one set of new taller monopole structures. To identify potential ways of avoiding or mitigating these effects, PSNH representatives met numerous times with Newington town officials. As a result of these discussions and in consultation with PSNH's historic resources experts, an alternative overhead design was developed with H-frame structures that allowed for the longest possible spans (and fewest structures) with the shortest possible structure heights. The Applicant also considered undergrounding the Project in the vicinity of the Newington Center Historic District and the Frink Farm. However, all of the necessary rights for undergrounding the line could not be obtained.[27]

To minimize potential impacts to the Newington Center Historic District, the proposed H-Frame design was enhanced in several ways. Based on the optimized design, the new western structure will be placed in a wooded area just prior to the open field. A new structure to the east will be placed near Nimble Hill Road where distribution facilities already exist. The new middle structure will be placed at the same location as an existing structure in the field at a location that is not currently cultivated. The new design will reduce the number of structures in the Frink Farm field area from five down to three. Additionally, to reduce the number of electric lines visible in the area, PSNH will remove the existing distribution line in this same corridor so that there will be only one line and fewer structures in the ROW.

[27] See Section 301.03(h)(2) and Pre-Filed Testimony of James Jiottis for a further discussion of the underground option through the Historic District that was proposed to the Town of Newington.

The placement of one structure on the Frink Farm property also has a potential visual effect on the Pickering-Rowe House on Old Post Road in Newington. As discussed above, the Project attempted to eliminate the structures in this area by placing the line underground, but all of the necessary rights could not be obtained. The Project also tried to relocate this structure, but a move would have resulted in greater impact.

(2) Archeological Resources

The Project has considered the location of known sites and archeologically sensitive areas during Project design to avoid potential impacts where feasible. As a result, the placement of structures and work pads minimizes impacts to the areas identified in the Phase I-A survey. Subsequent steps at the Phase I-B and Phase II survey levels and continued consultation with NHDHR, the USACE and any consulting parties will provide information to aid in additional impact avoidance prior to final design and construction.

(3) Mitigation

Mitigation will be provided for any unavoidable impacts to historic sites. This generally consists of measures that serve to preserve the history of the resource or enhance understanding of the resources. All mitigation measures will be developed in coordination with NHDHR and the USACE as the lead federal agency.

For archeological resources, mitigation measures may range from "data recovery" to "preservation in place." According to the NHDHR Standards and Guidelines, Phase III Data Recovery is "a full-scale investigation of the portion of the site affected by the project." As such, this effort entails a series of steps including (1) development of a research design, (2) collection of detailed information on past environmental conditions and context, (3) completion of research, field investigations and analysis of features, strata, and artifacts pertinent to research questions; and (4) reporting on results and findings. Other measures include buffering of cemeteries or graveyards; accommodating the potential for unmarked graves or funerary goods that may occur beyond fenced enclosures; adoption of an "unanticipated finds" policy to address resources discovered during construction, including, a halt in construction work; on-site cultural resources monitoring as appropriate; and the use of barrier fencing or other protective measures.

SRP will be required to provide mitigation for any unavoidable effects to above ground resources, as well, as is typical in the Section 106 process. The required mitigation elements will likely be memorialized in an agreement with the USACE and NHDHR, an agreement that will continue beyond the SEC timeframe. These mitigation elements will be determined through consultation among USACE, NHDHR, SRP, and the consulting parties. It is premature to identify specific mitigation measures for unavoidable potential adverse effects, but they likely will take the form of preservation and education measures. The efforts to preserve the Cable Terminal House in Durham will also provide substantial mitigation for unavoidable impact during construction.

Based upon the avoidance, minimization, and mitigation efforts proposed by PSNH and as explained in the Pre-Filed Testimony of Victoria Bunker and Cherilyn Widell, the Project will not have an unreasonable adverse effect on archeological resources or above ground historical resources.

(e) Description of the status of the applicant's consultations with the division of historical resources of the department of cultural resources, and, if applicable, with the lead federal agency, and, to the extent known to the applicant, any consulting parties, as defined in 36 C.F.R. §800.2(c).

The Project filed a RPR with the NHDHR for the Project on March 4, 2015. NHDHR responded with comments on the RPR and concurred with findings presented in the Phase I-A archeological report on March 19, 2015. Those comments included a specific requested consultation on the National Register listed Newington Center Historic District. On March 20, 2015, PSNH filed an initial Section 106 Request for Permit Area Determination with the United States Army Corps of Engineers ("USACE"). The USACE issued permit area determination letters on May 4, 2015, September 15, 2015, March 10, 2016 and March 29, 2016.

Project representatives met with NHDHR on April 10, 2015 and discussed in part the historic resources review process. NHDHR officials pointed out the special need to work with the towns of Durham and Newington as they are Certified Local Governments under the National Historic Preservation Act. NHDHR also recommended a one mile APE for indirect visual effects. That meeting was followed by e-mail exchanges between Laura Games of PSNH and Edna Feighner at NHDHR that addressed the planned SRP application. In response to the May 4, 2015 letter from the US Army Corps of Engineers (USACE) to NHDHR on the permit area for archeological survey, SRP and NHDHR again exchanged e-mails on May 14, 2015. NHDHR replied to the USACE letter on May 26, 2015 and the USACE responded in a letter dated May 8, 2015. (That date appears to be in error and was presumably sent June 8, 2015.)

SRP next communicated with NHDHR by phone on October 20, 2015. That call dealt mostly with the status of work on cultural resources review, including Phase 1-B archeological survey and the need for a PAF prior to filing the SEC application. The Project's efforts to address concerns about potential impacts to the Newington Center Historic District were also discussed.

Two meetings between NHDHR and SRP were held in January 2016. The first on January 12 included a brief discussion on the impending SRP application to the SEC, and the second on January 20 included discussions on cultural resource survey work and SEC application requirements. A follow up meeting was held with NHDHR on February 23, 2016 to discuss the PAF, inventory forms, SEC application requirements and the schedule for NHDHR review.

On March 18, 2016 a meeting was held with NHDHR, SRP and SRP's historic consultant (Preservation Company) and visual consultant (LandWorks) to discuss the methodology used to assess potential visual impacts from the Project.

On March 22, 2016 a meeting was held with NHDHR, SRP and SRP's archeological resource consultant, Victoria Bunker that included a discussion of the Phase I-B methodology for the Project.

Also, all of the historic properties identified by the Town of Newington (a Consulting Party) in a March 1, 2016 letter from Elizabeth Boepple, of BCM Environmental & Land Law, PLLC were considered in the Project Area Form.

Consultation with NHDHR and the USACE is ongoing and will continue through the siting process. See Appendix 33 for documentation of correspondence with the state and federal agencies.

(f) Summary

Based on the foregoing discussion, as supported by the Pre-Filed Testimony of Victoria Bunker and Cherilyn Widell, the Project will not have an unreasonable adverse effect on historic sites.

Site 301.07 Effects on Environment.

Each application shall include the following information regarding the effects of, and plans for avoiding, minimizing, or mitigating potential adverse effects of, the proposed energy facility on air quality, water quality, and the natural environment:

(a) Information including the applications and permits filed pursuant to Site 301.03(d) regarding issues of air quality;

Construction of the Project may have minor, short-term localized effects on air quality, primarily from fugitive dust (resulting from ground disturbance at work sites and vehicular movements on access roads along the corridors). No long-term effects on air quality will result from the operation of the proposed transmission lines. For purposes of conformity of the Project with the National Ambient Air Quality Standards pursuant to Clean Air Act § 176(c), the emissions are considered *de minimus* and exempted per 40 CFR Part 93.153(c).

To minimize short-term adverse effects to air quality during construction, environmental monitors will review ongoing activities, including verifying and documenting that appropriate preventative and proactive BMPs are being used and maintained. These practices may include mulching/covering soil stock piles and installing wind breaks to reduce the potential for the generation of wind-eroded particulates, using water trucks to suppress construction-related (fugitive) dust when necessary, and installing crushed stone aprons at all access road entrances to public roadways to minimize tracking of soil onto public thoroughfares. In addition, vehicular emissions will be limited by requiring

contractors to properly maintain construction equipment and vehicles, and by minimizing vehicle idling times in accordance with New Hampshire air quality regulations.[28]

As presently designed, the Project will not require the use of stationary back-up generators to support customer load.[29] Generators that may be used during construction of the Project will be operated in compliance with permitting and emission requirements. Once constructed, the Project will produce no air emissions, and therefore, will not have an adverse impact on local air quality.

(b) Information including the applications and permits filed pursuant to Site 301.03(d) regarding issues of water quality;

PSNH has contracted with a number of experts to study existing resources and the potential effects from the Project. Remote data collected includes site-specific bathymetry, topography, and aerial photography. Field geophysical studies include vibracoring, subsurface profiling, underwater side-scan sonar, and a diver inspection to identify the potential barriers to jet plow installation for removal. Site specific field surveys for wetland resources, rare species, eelgrass, shellfish and benthic communities were conducted. Modeling for assessing the water quality impacts from the jet plow and hand jetting operations was also performed.

(1) Introduction on Water Quality Issues

PSNH has designed this Project to avoid environmental impacts where possible and to minimize impacts where unavoidable. Extensive environmental surveys were conducted in consultation with the environmental regulatory authorities. The results of these studies were incorporated into the engineering and construction aspects of the Project, resulting in a final design that avoids and minimizes environmental impacts to the greatest extent possible, while still achieving the goals of the Project. These engineering design alternatives are discussed in detail in Section 301.03(h)(2), above.

The Project is proposed to be constructed almost entirely within an existing electric utility corridor. Impacts to the environment in upland areas will be limited to the side trimming and tree removal along the railroad corridor, the additional 40 feet of clearing in the PSNH corridor, structure installation, and temporary impacts due to the construction activity.

Impacts to water resources are almost entirely temporary. Direct fill impacts have been avoided where possible resulting in a total of 6,126 square feet (0.14 acres) of permanent fill in wetlands. These impacts include 792 square feet (0.02 acres) of

[28] NHDES Air Program Rules (Env-A 1100) establish a limit on the amount of time that engines are permitted to idle. The limit established in the regulations is based on outside temperature. Maximum idling times are as follows: 5 minutes for temperatures above 32°F; 15 minutes for temperatures between -10°F and 32°F; and, no time limit below -10°F. Exemptions to these rules include vehicles in traffic, emergency vehicles, vehicles providing power take-off (PTO) for refrigeration or lift gate pumps, and vehicles supplying heat or air conditioning for passenger comfort during transportation.

[29] Should the installation of stationary generators be deemed necessary in the future, the applicant would apply for the required permits in accordance with NHDES Air Program Rules.

permanent fill in freshwater wetlands; and potentially 5,336 square feet (0.12 acre) in tidal wetlands (intertidal unconsolidated bottom) if protective cover is needed over the buried cables. Temporary impacts to freshwater wetlands primarily result from matting to access structure sites and to clear trees (304,053 square feet, 6.98 acres). Proposed construction crossings of almost all streams will be bridged to avoid the need for culverts and other in-stream impacts. Indirect impacts are related to vegetation conversion (permanent tree removal) in the wetlands and will result in 317,800 square feet (7.30 acres) of wetland conversion.

Approximately 6.27 acres of temporary estuarine wetland impacts result from burial of the three cables under Little Bay. These include open cut-and-cover in the salt marsh (1,222 square feet; 0.03 acres) and rocky shore (302 square feet, 0.01 acres), and burial via jet plow across the intertidal flat (144,091 square feet; 3.31 acres) and subtidal bottom (127,397 square feet, 2.92 acres).

To assess potential impacts to estuarine resources, field surveys of eelgrass, shellfish, benthic infauna and epifauna were conducted, and desktop studies for listed fish, Essential Fish Habitat (EFH), diadromous fish, sediment texture and quality, and water quality were performed. Potential water quality effects were studied by modeling the hydrodynamics of Little Bay, and the extent and degree to which the jet plowing and hand jetting operations are anticipated to suspend sediments in the water column and redeposit them on the bottom. See Appendix 34, *Natural Resource Impact Assessment Report.*

Further information and specific details are also contained in the NHDES Wetlands Permit Application (which also serves as the USACE Programmatic General Permit Application). See Appendix 13.

a. Surface water quality

1. Background & potential effects

Impacts on surface water quality from the Project include temporary increases in total suspended solids during installation of the submarine cable in Little Bay. On land, potential stormwater runoff and erosion from access roads and Project work areas during construction could potentially adversely affect surface waters in the Project area, including wetlands, intermittent streams and ephemeral streams. No permanent impacts are anticipated for any surface water.

2. Study & mitigation

The largest surface water body crossed by the electric utility corridor is Little Bay, which is part of the Great Bay Estuary. There are no named freshwater lakes or ponds within the corridor. The study area contains 18 perennial stream segments, including Beards Creek, College Brook, Oyster River and several unnamed tributaries to Oyster River, two reaches of LaRoche Brook, Beaudette Brook, and Longmarsh Brook, Knights Brook and Pickering Creek. See Appendix 3, *Existing Conditions Maps*. Eight

intermittent stream segments, including Hamel Brook and Reservoir Brook were also identified, and six stream segments classified as ephemeral. The most significant drainage identified within the Project study area is the Oyster River. Both Little Bay and the Oyster River provide EFH for several fish species and are the only waterbodies crossed by the SRP corridor that are subject to the New Hampshire SWQPA.

3. Little Bay

The technologies for the installation of the three transmission cables crossing Little Bay, primarily jet plow with hand jetting and excavation in the nearshore, will suspend sediments into the water column, resulting in a temporary increase in the suspended sediment load over ambient conditions. Using a hydrodynamic model of Little Bay and the suspended sediments dispersion model ("SSFATE"), RPS ASA, a global science and technology solutions company, characterized the dispersion and re-deposition of these sediments resulting from jet plowing using an assumed advance rate of 330 ft/hr (100 m/hr) provided by an experienced marine contractor. At that rate, each crossing is likely to generate suspended sediment plumes that range in concentration from 10 to 5,000 mg/L above ambient concentrations. Concentrations in the majority of the plume will be very low (about 10-20 mg/L above ambient), with the highest concentrations occurring directly over the trench. Cumulatively, over the approximately 13-hour installation process for one cable, the plume (10 to > 5,000 mg/L) will affect about 400 acres, although the maximum extent of the plume at any given time will be 15 to 55 acres. The plume will be controlled by the tide stage, and centered in the vicinity of the jet plow at any given time. Maximum plume concentrations are expected to drop below 100 mg/L above ambient within about two hours and below 20 mg/L within about three hours. The model indicates the plume will be entirely dispersed within six hours of passing a given point on the route. Once the jet plow stops operating, no additional sediment will be suspended and the residual plume will completely dissipate in less than two hours. See Appendix 35 for the RPS ASA report entitled *Modeling Sediment Dispersion from Cable Burial for Seacoast Reliability Project, Little Bay, New Hampshire*.

Reduction in plume concentrations will occur as a result of dispersal and settlement of sediments out of the water column. RPS ASA predicted that, as a result of installation of the three cables using a jet plow, sediments redeposited on the bay floor would cover a 5.9-acre area (1.5 times the footprint of the trenches), including the trenches themselves, in a layer 0.2 to 0.4 inches (5 to 10 mm) thick. RPS ASA predicted that deposition of sediments 0.004 to 0.2 inch (0.1 to 5 mm) thick could extend over an additional area of up to 139 acres, but deposition over most of that area (about 88 acres) would be 0.02 inch (0.5 mm) or less.

The likelihood of the jet plow operation taking longer than the predicted 13 hours, or starting up substantially later than planned (high slack tide), is low. It is possible that substrate conditions along the crossing will allow a higher advance rate. A higher advance rate would result in a somewhat higher density plume and thicker bottom deposition, but would affect a smaller area than with the slower (modeled) rate.

The jet plow will not be able to access the upper intertidal area on either the west or the east shorelines. Cables will be laid on the substrate surface in these areas initially and when jet plowing is complete, divers will return to use hand jets to bury the cables. On the west side, the entire section will be enclosed using silt curtains during this process and 90% of the disturbed, fluidized sediments will be retained within resulting minimal development of a sediment plume. On the east side, silt curtains will be used to enclose the 367-foot long section between approximately mean low water and the eastern shoreline with the same result as on the west side. Divers will also have to bury cables along an additional 230-foot long area in the shallow subtidal on the east side of the bay where the strength of tidal currents is too high to allow the use of silt curtains. In this area sediments disturbed by the divers will be suspended into the water column and dispersed. RPS ASA predicted that sediments from this unprotected activity will produce a plume that is likely to extend about 1,000 feet beyond the work area where concentrations would be about 10 mg/L above ambient. When burial of the cables by divers takes place around high tide, the plume would be directed primarily to the north and would occupy an area of less than five (5) acres. Where water depth is sufficient, divers will also be able to work around low slack tide. When this happens, the plume would flow primarily to the south. In both cases, highest concentrations would be centered over the work area and remain in the lower half of the water column. Repeated sediment-disturbing activity in a small area may result in a small residual plume of low concentration (10-20 mg/L) that persists for up to two days following completion of the unprotected diver burial.

In the areas where diver burial of the cables will take place within silt curtains, the suspended sediments will ultimately be redeposited within the entire enclosure forming a layer of unconsolidated material averaging approximately 1.2 (west) to 1.4 (east) inches thick although deposition will be greater directly over the trenches and thinner closer to the silt curtains. Sediments suspended by divers in the unprotected area will be deposited most thickly (up to 2 inches thick) in the immediate vicinity of the work area and more thinly with distance from the work area. Over time, the newly deposited, unconsolidated sediment particles will likely be re-distributed by tidal currents and wave action to restore original bottom contours.

While jet plowing and hand jetting by divers will cause changes in water quality by increasing suspended sediment concentrations in the water column, the duration of these changes will be brief. Jet plowing will take about 13 hours per cable and there will be about a one-week interval between installations. The configuration of the jet plow being proposed for this Project will incorporate a design that minimizes the amount of sediment that will be released into the water column. The tidal currents in the area will aid in dissipating the suspended sediments quickly and there will be no evidence of the plume within a matter of two (2) hours or less following completion of each jet plow operation.

Hand jetting is a much slower process than jet plowing and will take up to 90 days to complete (working only in the four-hour window around slack high tide). The potential to create suspended sediment plumes from hand jetting has been minimized by the Project's commitment to use silt curtains around most of the area where this activity will be needed. Even in the portion of the route where silt curtains are not feasible, alterations to water quality will be temporary and will not require further mitigation.

Very close to both shores, the submarine cable will be buried using an excavator working from timber mats in the Project corridor. This work will be entirely within the confines of the silt curtains and is anticipated to occur within one tidal cycle. The speed at which the work proceeds could be slowed by ledge or boulders within the burial depth. If ledge is encountered, the burial depth will be attempted using a rock hammer to break the rock into maneuverable pieces. If this process is unsuccessful, protective concrete mattresses may be necessary to provide adequate cover for the cables.

4. Freshwater Streams

In general, the streams identified within the Project corridor are low gradient, slow flowing systems that are consistent with the flat topography of the coastal plain region of New Hampshire. Human disturbances were observed near established development, including the railroad, roads and highways and larger-scale commercial developments; these disturbances included culverts, evidence of stormwater input, and ditching.

No permanent impacts to streams will occur. Temporary stream impacts during construction will total 211 square feet (0.01 acre). Secondary stream impacts from clearing within the stream buffers will result in the loss of tree canopy over the stream. This impact is anticipated to be approximately 65,741 square feet (1.51 acres) to perennial streams, 16,144 square feet (0.37 acres) to intermittent streams, and 5,340 (0.12 acres) to ephemeral streams.

Impacts to most streams will be avoided during construction by bridging. Two streams will have short sections of temporary culverts under work

pads that unavoidably cross the stream channel. In the underground section through UNH, burial under a small perennial stream will require briefly diverting the stream using hoses and coffer dams while the installation is made. The stream channel will be restored and stabilized promptly after completion of the cable burial. The details of these impacts are reported in the NHDES Wetlands Permit Application, which is included in Appendix 13. No long term impacts to water quality and/or temperature in any of the streams located near the Project are anticipated.

In 2012, the NHDES categorized all surface waters as Category 5 as a result of a statewide fish consumption advisory for mercury in freshwater fish (Edwardson, 2012). Multiple impaired waters, including Little Bay and the Oyster River, are located within one mile of the Project site. Since impairments are generated from regional pollutants as opposed to local pollutants, the Project will have no impact on surface water impairments.

The design for the Project incorporates BMPs that will be employed prior to, and during construction, to limit the mobilization of total suspended solids during work near freshwater resources. PSNH will conduct frequent monitoring of the performance of such devices and corrective actions will be employed if necessary.

b. Stormwater, soil erosion and sediment control

1. Background & Potential Effects

The Project will involve construction of approximately 13 miles (59 acres) of temporary access roads and work pads to clear vegetation and construct the Project. During construction, the potential for erosion and sedimentation of waterbodies is increased as a result of work activities. As described below, the Project will minimize soil disturbance through the use of timber matting in sensitive areas such as wetlands and in rare species and archeologic resources areas. Vegetation removal will be performed on mats in wetlands, where necessary, to minimize soil disturbance and rutting.

2. Study & Mitigation

Management of stormwater runoff and erosion, and sediment control are described in detail in Section 301.03(g)(9), with locations generally depicted on the Environmental Maps, Appendix 2. These measures minimize and mitigate for any soil erosion due to construction of the Project. The Project will not substantially change natural drainage patterns due to the use of timber matting in sensitive resource areas (wetlands, rare species and archeologic sites) and minimal grading of upland access roads. Design measures to protect surface water quality during construction of the Project include avoidance of stream impacts by using bridges and temporary culverts, and control of erosion during construction through the use of sediment barriers (such as silt socks, straw wattles, and other

permeable barriers consisting of bark mulch and stump grindings). Some construction access roads will require additional BMPs for areas that have a higher potential to impact water quality, due mostly to steep slopes and proximity to water resources. Immediately following construction, any disturbed areas will be promptly stabilized using measures including, but not limited to, hydroseeding and use of erosion control blankets or spray-on polymer emulsions on steep slopes. More details on erosion control measures are described in the NHDES Alteration of Terrain application, which is included in Appendix 16.

c. Wetlands

1. Background and potential effects

Wetlands within and adjacent to the Project area were delineated or reviewed by state certified wetland scientists ("NHCWS"). A total of 114 wetlands (totaling approximately 43 acres) were delineated within the SRP corridor with the most abundant cover type being emergent/scrub-shrub, followed by freshwater emergent, intertidal, and subtidal. The remaining cover types consisted of various combinations of either emergent, scrub-shrub, or forested wetlands. The predominance of emergent and scrub-shrub wetlands is due to the on-going maintenance of the current electric utility corridor. The Project crosses three wetlands designated as Prime Wetlands in Newington in a total of five locations. A qualitative assessment of 13 wetland functions and values using the USACE Highway Methodology found that, while multiple functions were provided to some degree by most wetlands, the principal functions were the distinguishing features among the wetland types. The most common principal functions include: Groundwater Recharge/Discharge, Wildlife Habitat, Production Export, Sediment/Toxicant/Pathogen Retention, Floodflow Alteration and Nutrient Retention.

2. Study and mitigation

Permanent wetland impacts total approximately 6,128 square feet (0.14 acres). These include 792 square feet (0.02 acres) of freshwater impacts due to new transmission structures and relocated distribution structures located within or partially within wetland areas. An additional 5,336 square feet (0.12 acres) to intertidal mudflat and rocky shore are proposed in the event that concrete mattresses are needed to protect the buried cable.

Approximately 304,053 square feet (6.98 acres) of temporary impacts to freshwater wetlands result from temporary timber matting required to access and construct the Project. Approximately 6.27 acres of temporary estuarine wetland impacts result from burial of the three cables under Little Bay. These include open cut-and-cover in the salt marsh (1,222 square feet; 0.03 acres) and rocky shore (302 square feet, 0.01 acres), and burial via jet plow across the intertidal flat (144,091 square feet; 3.31 acres) and subtidal bottom (127,397 square feet, 2.92 acres).

Secondary impacts from vegetation conversion due to removal of the trees in forested wetlands will impact 317,800 square feet (7.30 acres). Clearing of the upland buffer of perennial, intermittent and ephemeral streams will result in 87,225 square feet (2.00 acres) of secondary impacts.

For the terrestrial areas, timber mats (approximately 4 feet by 16 feet) will be used for wetland crossings and work pads where necessary. Most stream crossings will avoid stream impacts by constructing temporary timber mat bridges located outside the banks, with no permanent or temporary culverts planned. Three streams are located within work pad areas, and may need temporary culverts during construction activities. Temporary culverts will be sized based on appropriate guidelines to accommodate flows. These areas will be inspected and maintained throughout construction by an environmental monitor and the temporary culverts will be removed when no longer needed.

Wetland Mitigation

The first steps in mitigating wetland impacts is to avoid and minimize impacts through project design. This has been a key component of the design for SRP project. The Project design team has worked with engineers and scientists to make design changes in order to avoid wetland impacts wherever possible. See Section 301.03 (h)(2). Compensatory mitigation will be required for unavoidable impacts to permanent wetland fill and conversion of forested wetlands as a result of tree clearing.

Permanent direct wetland impacts are below the NHDES threshold for mitigation (10,000 sq. ft. of permanent wetland impact). Secondary impacts due to tree removal exceed that number, and result in the need for federal compensatory wetland mitigation. Therefore, in accordance with applicable USACE regulations and guidance, mitigation is proposed for direct and secondary Project impacts to wetlands and impacts to stream buffers. Mitigation ratios were applied to these anticipated impacts in accordance with the *New England Army Corps of Engineers Mitigation Guidance* document and in coordination with the USACE, and NHDES.

During the agency pre-application meeting, NHDES and USACE agreed that in-lieu fee payment into the State's Aquatic Resource Mitigation fund was appropriate compensatory mitigation for a linear project such as the SRP. The Project proposes mitigation in the form of in-kind, permittee-responsible mitigation (i.e., upland buffer preservation) and/or an In-Lieu Fee contribution to the Aquatic Resource Mitigation ("ARM") fund.

The Project impacts and approximate total cost for the compensatory payment by town is shown in Table X. The dollar value may change during the review process with NHDES and USACE. Details are also provided in the NHDES Wetland Permit Application. See Appendix 13.

Table 2. Approximate in lieu fee payment for compensatory wetland mitigation for the SRP.

Town	A: Secondary Impact: Forested Wetland Conversion (SF)	A1: Conversion Mitigation Area (15% of total area A)(SF)	B: Secondary Impact: Stream Buffer Clearing (SF)	B1: Conversion Mitigation Area (15% of total area B)(SF)	C: Permanent Impacts (SF)	Total Impacts for Mitigation by Town (SF) (Sum A1+B1+C)	ARM Payment (from NHDES ARM Fund Calculator by Town)[30] (USD)
Madbury	2,072	311	7,383	1107	199	1,617	$6,488.92
Durham (Freshwater)	217,334	32,600	69,022	10,353	214	43,167	$183,385.10
Durham (Tidal)	-	-	-	-	3,550	3,550	$30,162.72
Newington (Freshwater)	87,089	13,063	10,820	1,623	379	15,065	$66,079.42
Newington (Tidal)	-	-	-	-	1786	1,786	$15,667.82
Portsmouth	11,305	1,696	0	0	0	1,696	$8,187.14
Total:	317,800	47,670	87,225	13,084	6,128	66,880	$309,971.11

The Project has reached out to the towns of Durham and Newington, as well as to multiple regional and state-wide conservation organizations to identify suitable potential permittee-responsible compensatory mitigation projects. Contacts have included multiple Town officials and the Conservation Commissions of Durham and Newington, The Nature Conservancy, Southeast Land Trust, Society for the Protection of New Hampshire Forests, Piscataqua Regional Estuary Program, and collectively, the Great Bay Resource Protection Partners.

The Town of Durham provided a potential wetland restoration and upland buffer protection project, summarized below. The restoration concept has merit for compensation for different aspects of wetland resource impacts by the SRP if the regulatory agencies concur.

Wagon Hill Farm, Durham

The Town of Durham has proposed an environmental mitigation project to reduce the amount of erosion from the Wagon Hill Farm shoreline bordering the Great Bay Estuary and the Oyster River. Wagon Hill Farm is Town-owned conservation land consisting of 139 acres with 1,100 feet of tidal frontage on the Little Bay, Oyster River and Smith Creek, and 8.5 acres of tidal and freshwater wetlands. The Project proposes to stabilize the existing eroded portions of the shoreline, which is the result of uncontrolled foot traffic along the shoreline. These pathways have eroded

[30] http://des.nh.gov/organization/divisions/water/wetlands/wmp/

and the erosion has been exacerbated by natural conditions including wind, wave and ice action. This erosion is continuing to degrade shoreline and salt marsh habitats and has negative impacts on wildlife, shellfish, and fish habitats. The erosion stabilization would include both stabilizing and restoring the shoreline, as well as further measures to halt foot traffic in the sensitive areas by re-designing nearby walking paths to discourage off-path travel, fences and viewing platforms on the adjacent upland. A second habitat protection effort is a footbridge proposed to be constructed over Davis Creek and adjacent wetlands to control off-path travel by people and pets.

The stabilization projects will help to protect the water quality and aquatic habitats of the local streams, adjoining bordering wetlands, and the Great Bay estuary including the adjacent Salt Marsh and Sparsely Vegetated Intertidal systems, both of which are Exemplary Natural Communities documented by NHNHB. Preliminary estimates suggest that approximately 700-900 square feet of salt marsh, plus approximately 1,100 linear feet of adjacent shoreline could be restored. Impacts to freshwater wetlands along Davis Creek are estimated as 500 square feet. The Town of Durham has recently partnered with UNH coastal ecologists and NHDES coastal staff to develop strategies for restoring salt marsh and developing long-term stabilization along the shoreline. This partnership will bring current and potentially innovative techniques to addressing erosion, controlling freshwater runoff, and limiting human-caused destabilization.

The Wagon Hill Farm shoreline stabilization project provides the opportunity to mitigate for unavoidable permanent impacts caused by SRP structures in freshwater wetlands ((approximately 700 square feet in Durham), potentially 2,500 square feet of impact from concrete mattresses on tidal flats, and clearing of freshwater wetlands and streams as a result of tree removal within the SRP project corridor. It also provides the opportunity to restore sections of deteriorated or fully eroded salt marsh, and would further reduce sediment loading into critical estuarine habitats. The project has been estimated to cost $370,000, including $340,000 for shoreline restoration, $10,000 for a bridge over Davis Creek, and $20,000 to stabilize and restore Davis Creek Point. The Town of Durham is anticipating that PSNH's contribution of approximately $170,000 would complete the project, in addition to $115,000 from the Lois Brown Trust and approximately $84,000 to be raised by the town. The Durham Town Council has approved this project as part of the 2016 annual budget, pending regulatory permit approval for the PSNH contribution.

PSNH will continue to work with all parties to develop a mitigation package that will be acceptable to NHDES and USACE.

d. Agency Consultation

Multiple meetings with state and federal regulatory agencies have occurred as the Project design has progressed. The purpose of the meetings was to inform agency personnel of the Project design, discuss pertinent issues and respond to concerns and questions. An initial pre-application meeting to review the wetland, stream and wildlife resources was held on January 6, 2015 with the NHDES, NHF&G, NHNHB, USACE, USEPA, USFWS, and NMFS. Additional agency pre-application meetings have included one to introduce the Project to the NHDES project manager on February 25, 2015. A second meeting to discuss resources and Project activities in Little Bay was held on March 3, 2015 with NHDES, USACE, USEPA, and NMFS; a meeting describing the Project and potential impacts was held on May 7, 2015 with NHF&G environmental review team; and an additional pre-application meeting was held on June 10, 2015 with NHDES and USACE. NHF&G held a meeting on September 17, 2015 to specifically provide information to, and address concerns of, oyster aquaculturists.

Additional communications to individual regulators occurred to ask or answer questions regarding the Project, including USACE, NHDES, NHF&G, USFWS and NHNHB. A final multi-agency pre-application meeting was held January 12, 2016 with state and federal agencies. Attendees included NHDES Wetlands Bureau, Alteration of Terrain, and Water Quality staff, NHNHB; USACE; USEPA; USFWS and NMFS. The purpose of this meeting was to present the final permitting design, describe the Project community outreach efforts, and request any outstanding agency concerns.

See Appendix 36 Summary of Outreach, which includes meetings with agency officials.

(c) Information regarding the natural environment, including the following:

The Applicant has performed a number of studies to evaluate the potential effects of the Project on a wide range of natural resources. All supporting technical reports are provided in the appendices to this application.

(1) Description of how the applicant identified significant wildlife species, rare plants, rare natural communities, and other exemplary natural communities potentially affected by construction and operation of the proposed facility, including communications with and documentation received from the New Hampshire department of fish and game, the New Hampshire natural heritage bureau, the United States Fish and Wildlife Service, and any other federal or state agencies having permitting or other regulatory authority over fish, wildlife, and other natural resources;

Project wildlife biologists, botanists, and fisheries and marine scientists researched the rare resources and species provided by the NHNHB, USFWS and NMFS in response to the Project's requests for information. See Section 301.03(c)(5). Habitat and species surveys were conducted in suitable habitat within the corridor during appropriate

portions of the year. Some of the rare wildlife, avian and fish species are likely to utilize the Project corridor during portions of their life cycle. Collectively, the resource agencies provided records for twenty-eight rare, threatened and endangered ("RTE") species and six exemplary vegetation communities. Field surveys were performed for most of the listed RTE plant species and all natural communities.

(2) Identification of significant wildlife species, rare plants, rare natural communities, and other exemplary natural communities potentially affected by construction and operation of the proposed facility;

a. Rare Plants and Exemplary Natural Communities

One state-endangered plant species, crested sedge, was observed within the Project Area. Four exemplary natural communities or natural community systems were confirmed within the Project Area in Little Bay: High salt marsh, Salt marsh system, Sparsely vegetated intertidal system, and Subtidal system. A full description of listed species is in the Rare, Threatened and Endangered Species and Exemplary Natural Communities Report. See Appendix 37.

b. Rare, Threatened and Endangered Wildlife Species

Portions of the SRP corridor have the potential to support rare wildlife species, including New England cottontail, northern long-eared bat, American bald eagle, osprey, northern black racer, Blandings turtle, spotted turtle, ringed boghaunter, American eel, banded sunfish, and swamp darter. While none of these species were directly observed during corridor surveys, the Project has assumed they could be present for some portion of the year and has developed construction practices to avoid and minimize adverse effects to the species and their habitats. A full description of listed species is in the Rare, Threatened and Endangered Species and Exemplary Natural Communities Report for this project. See Appendix 37.

(3) Identification of critical wildlife habitat and significant habitat resources potentially affected by construction and operation of the proposed facility;

a. General Wildlife Habitat

The SRP corridor crosses through some areas designated as Highest Ranked Habitat by the NH Wildlife Action Plan ("NHWAP"). See Appendix 7. The NHWAP designates all coastal habitats as Highest Ranked Habitat, along with alpine habitat, the highest quality 15% of forest habitats by area, the top 10% by area of other habitats types, and a few other locations containing critically imperiled species. The remainder of the corridor passes primarily through areas that are designated as Supporting Landscapes or that have no designation at all. The NHWAP defines Supporting Landscapes as the upland part of the watershed for surface waters, certain intact forest blocks, some known locations of listed species, and some locations of exemplary natural communities. The relative proportion of these habitat types in the corridor reflects their relative distribution in the surrounding landscape.

b. Rare, Threatened and Endangered Wildlife Species

Portions of the SRP corridor are in the vicinity of rare wildlife species habitat, including, but not limited to, New England cottontail, northern long-eared bat, northern black racer, Blandings turtle, spotted turtle, ringed boghaunter, American bald eagle, osprey, American eel, banded sunfish, and swamp darter.

(4) Assessment of potential impacts of construction and operation of the proposed facility on significant wildlife species, rare plants, rare natural communities, and other exemplary natural communities, and on critical wildlife habitat and significant habitat resources, including fragmentation or other alteration of terrestrial or aquatic significant habitat resources;

Detailed descriptions of the various natural resources in the SRP corridor are included in the Natural Resource Existing Conditions Report, Appendix 7, Rare, Threatened and Endangered Species and Exemplary Natural Communities Report, Appendix 37, and the Essential Fish Habitat Report, Appendix 38. Impacts to all natural resources in the Project Area are described in more detail in the Natural Resource Impact Assessment Report. See Appendix 34.

a. Rare Plants

Temporary work roads will impact a very small area (60 square feet) of the state-Endangered crested sedge habitat mapped within the Project corridor. All work will be performed on timber mats to minimize soil disturbance and damage to this perennial species. PSNH will conduct population monitoring both before and after construction to assess the response of crested sedge to the construction impacts, and the tree clearing, both of which could be beneficial to this open-grown species.

b. Rare, Threatened and Endangered Wildlife Species

No rare wildlife species were found during field surveys, but Project construction will implement species-specific BMPs to avoid impacting these species and their potential habitats. Such BMPs will include having an active work area repeatedly surveyed by an environmental monitor prior to, and during, construction to remove any listed species individuals, and constructing during times of the year that minimize impacts to the species of concern.

Only minimal vegetation clearing or construction is necessary along the banks of the Oyster River and the Valentine Canal, thus no adverse impacts are anticipated for American eel, swamp darter and banded sunfish in these streams. The ringed boghaunter, a state-Endangered dragonfly, occurs in a sedge meadow near the SRP corridor. Some marginally suitable habitat for this species was identified within the corridor during a field survey, but no evidence of this species was observed and no impacts are anticipated from Project construction.

Based on USFWS New England Field Office guidance, northern long-eared bat is assumed to utilize portions of the SRP corridor due to recent studies that

indicate this species is more prevalent along the coast. The primary effect of the SRP construction to northern long-eared bat is related to tree removal to widen the existing cleared corridor. Potential direct impacts consist of disturbance to roosting adults and mortality of any young, non-flying bats as a result of the tree felling. Potential indirect effects from tree clearing consist of the loss of summer habitat, including foraging habitat and roost trees. There are no known nearby maternity roost trees or hibernacula within five miles of the Project Area. Therefore, tree removal will not affect swarming habitat, and Project construction does not have the potential to affect wintering habitat.

USFWS issued final rules for northern long-eared bat on January 14, 2016. The final rule states the species is threatened because of white-nose syndrome, not habitat loss. Therefore, the final rule does not restrict tree clearing for projects that are not near known maternity roost trees or hibernacula, such as the SRP, but continues to require consultation with USFWS.

The USFWS requested a Biological Assessment ("BA") to document the potential effects of the SRP on the northern long-eared bat. The federal nexus for this BA is the Section 404 permit required under the Clean Water Act for the proposed work. Based on the life history of the northern long-eared bat, the narrow corridor (100 feet wide), and the limited tree removal proposed, the conclusion of the BA is as follows: the effect of construction of the SRP on this species is so small as to be inconsequential to the population that may be present in the Project area and the overall population as a whole. See Appendix 39.

The New England cottontail is dependent on early successional habitat, such as the shrub and grasslands found under transmission lines. These types of habitats are declining throughout the cottontail's range as these habitats mature or are developed. PSNH is actively working with NHF&G to manage its transmission corridors to benefit the New England cottontail. The SRP corridor passes through UNH's Foss Farm and NHF&G's LaRoche Brook parcel, both of which are being actively managed for this species, although New England cottontail does not currently occur at either site. The SRP corridor will potentially benefit the species by supplementing its habitat and providing a potential connective route for this rabbit to disperse to other suitable habitats.

American bald eagles and osprey are known to use the Great Bay Estuary on a regular basis. Accordingly, the aboveground portions of the transmission line have been designed to meet industry clearance standards to minimize the risk of electrocution for raptors and other birds that might perch on power line structures.

The vegetation clearing necessary for crossing the Oyster River is not expected to adversely affect American eel usage of the Oyster River, and may benefit the swamp darter and banded sunfish by enhancing the development of the emergent and shrub vegetation preferred by these two species.

c. Wildlife Habitat

The proposed additional clearing within the corridor from 60 to 100 feet in width is likely to only minimally affect wildlife habitat, with little significant habitat loss to adjacent forested habitat and the forest-dependent wildlife species present. The benefits to species that depend on shrub and grassland habitats may be somewhat greater due to the relatively smaller amount of this habitat type that is currently available. The corridor is unlikely to create a barrier for wildlife that uses the surrounding forested habitats. The wildlife species that live in moderately developed landscapes, like the one that surrounds the Project area, are generally adept at crossing open habitats as needed. Construction oversight and timing of construction will be managed according to BMPs for affected species and habitats to minimize mortality and habitat impacts.

1. Potential Effects of the Little Bay Cable Crossing

Salt Marsh

Temporary salt marsh impacts (1,222 square feet, or 0.03 acres) will occur during cable burial performed by excavator across the narrow fringing salt marshes on the east and west shores of Little Bay. Given the shallow peat and underlying coarse gravel-sand substrates, the Project will undertake salvage of the existing salt marsh vegetation and peat for restoration after construction. The salvaged peat blocks will be stockpiled and protected during construction, and replaced at grade after substrates have been restored. This technique has been successful on multiple projects, and is expected to be so here. Post-construction monitoring will be implemented for three years following restoration to assess the status and success of the work, and to respond to any damage or adverse condition observed.

Macroalgae

Distribution of macroalgae within Little Bay is primarily limited to rocky areas. Approximately 496 square feet (0.01 acres) of rocky shore within the work area will be temporarily disturbed and macroalgae on the rocks will be eliminated. A rocky substrate will be replaced at the completion of the cable installation and it is expected that the same species of macroalgae (primarily *Fucus vesiculosus*) will recolonize naturally after construction is complete. Up to 302 square feet (0.01 acres) of rocky shore may be permanently impacted if concrete mattresses are required to protect the cable. This will destroy any macroalgae attached to the ledge or boulders, but it is expected that the same species of macroalgae (primarily *Fucus vesiculosus*) will colonize the concrete mattresses.

Eelgrass

No eelgrass was observed during the 2013 and 2014 Project-specific field surveys, nor in broader Great Bay Estuary eelgrass surveys performed by others. The area will be surveyed again for eelgrass during the active growing season prior to in-water cable installation. Eelgrass historically has occurred along the east shore of Little Bay within the mapped Cable Area

and was documented most recently in 2011 and 2012. Because the eelgrass bed observed in 2011 and 2012 in Welsh Cove occurred as the result of seed dispersal rather than rhizome growth and has subsequently disappeared, it is highly unlikely that there will be an established bed present when the cable installation takes place. Water quality modeling predicted that neither the plume nor deposition of suspended sediments resulting from the in-water construction activities will reach any established eelgrass beds.

By using the established Cable Area, PSNH has avoided direct impacts to established eelgrass beds. In the unlikely event that eelgrass has recolonized the proposed cable corridor prior to cable installation, PSNH will evaluate the extent and viability of the bed, and will work with the regulatory agencies to develop appropriate mitigation, if necessary.

Shellfish

The tidal flats in Little Bay support a population of shellfish of interest to harvesters, including softshell clams and razor clams, as well as ecologically important species such as *Macoma* sp. Individuals of these infaunal species that occur in the footprint of the cable trenches will be impacted by the jet plow and hand jetting processes. Those adjacent to the trenches will be subject to burial. Some, but probably not all, of those buried will be able to burrow up out of the excess sediments.

It may be necessary to protect the cables using articulated concrete mattresses in the upper intertidal on both sides of the cable crossing where rocks or bedrock may occur beneath the sediment surface. Shellfish in this area may be impacted by placement of the mattresses. It is likely that the artificial material will provide suitable substrate for macroalgae and potentially oysters.

There are no mapped oyster reefs in the vicinity of the cable route, although low densities of oysters were observed during field work. The nearest mapped natural reef is located offshore of the southeastern point of Adams Point although there may also be pockets of oysters occurring intertidally near the Project Area that are not mapped by GRANIT. Water quality modeling indicates that the suspended sediment plume is likely to come near but not encroach on the Adams Point reef for a brief period (one to two hours) during each installation. The model predicted that the highest suspended sediment concentrations to reach the vicinity of the Adams Point reef would be about 10-20 mg/L. This level of suspended sediments is well below the maximum values recorded for the area by Great Bay National Estuarine Research Reserve and well below levels shown in laboratory experiments to elicit any kind of response by oysters. Therefore, no discernable effects to oysters are expected. A proposed oyster restoration area adjacent to the southern border of the natural bed at Adams Point is not expected to be exposed to the plume. Other areas

where oyster reef restoration has taken place in Great Bay are even farther from the Project Area than Adams Point, so no impacts to these beds are anticipated.

Three aquaculture facilities in upper Little Bay are located close enough to the planned crossing to be potentially exposed to the sediment plume. Joe King Oyster Cooperative and Fat Dog Shellfish Co. are located on the western side of the bay just south of Durham Point. For a period of up to about four hours, the plume will flow towards these sites. Water quality modeling predicted that excess suspended concentrations in the plume near, and potentially overlapping, these farms will be about 10-20 mg/L. These concentrations are well within naturally occurring suspended sediment levels observed in the Bay during the fall, therefore no impacts to these farms are anticipated.

Located about 500 feet north of the planned cable crossing on the eastern side of the Bay, Bay Point Oyster Co. is at the eastern terminus of the jet plow portion of the route. As the jet plow approaches this area, the tide will be at flood stage so the plume will be flowing southward towards Furber Strait. Once the jet plow stops, no additional sediments will be dispersed into the water column and the plume will dissipate quickly. Thus, even though the tide will have reversed, the plume crossing the Bay Point farm will be of low concentrations (<20 mg/L) and short duration (< 1 hour). While some deviation in the jet plow rate of speed is possible, the likelihood that there will be a delay in reaching the eastern terminus of the cable such that the tide has reversed, transporting the plume to the north in the vicinity of Bay Point Oyster Co., is negligible. Because of the limited duration of exposure, it is unlikely that the oysters held at this farm would be experience physiological effects.

Bay Point Oyster Co. is close to the area where a portion of the cable will require burial by divers where it is infeasible to use silt curtains. A plume emanating from this activity may reach this farm. Again, the excess suspended sediment concentrations in the portion of the plume nearing this facility are expected to be < 10 mg/L, which is the lowest modeled concentration and within the natural variability of Great Bay.

It is possible that other, unmapped, oyster resources will be exposed to the plume. Given the ephemeral nature of the plume however, it is unlikely there will be significant deleterious effects on these resources.

Larval forms of both American oysters and softshell clams may be in the plankton while cable installation is taking place. Jet plowing will cycle approximately 1,000 m3/hour (264,172 gallons/hour) from Little Bay for a total of approximately 42x103 m3 (11.1x106 gallons) and planktonic organisms will be entrained in the system. This volume of water represents 0.17 (high tide) to 0.27 (low tide) percent of the total volume of upper

Little Bay, thus entrainment will have insignificant effects on the shellfish populations.

Benthic Infauna

Benthic infauna along each cable route will be displaced into the water column and adjacent substrate by the jet plow. Displaced individuals may or may not survive. Predators, such as lobsters and demersal-feeding fish, are often attracted to areas of disturbance so the likelihood of being consumed will be increased for displaced infauna. At least some of the infaunal species observed in the Project area are active burrowers and will survive re-deposition of suspended sediments. Some of the abundant species, however, are small-bodied embedded surface-deposit feeders and may not survive burial. Infaunal organisms occurring in the upper intertidal zone would be impacted by placement of articulated concrete mattresses used to protect cables where the required burial depth cannot be achieved. It is likely that the artificial substrate would ultimately be colonized by macroalgae and macrofauna typically found on hard substrate in this depth zone.

It is expected that the benthic infaunal community will have recovered in terms of abundance, and possibly species richness, by the end of the following reproductive period. Infaunal species observed in the Project footprint are also abundant in nearby habitats. These adjacent populations will be a source for recruitment.

Lobsters and Horseshoe Crabs

American lobsters and horseshoe crabs are both large benthic organisms likely to occur along the submarine cable route. Population estimates are not available for Little Bay. Because lobsters often burrow into the substrate during the day, those along the cable route would be impacted by the jet plowing. Although lobsters adjacent to the trenches would be subject to deposition, this is unlikely to have a deleterious effect because this species is an active burrower. Lobster larvae may be present in Little Bay during cable installation and would be vulnerable to entrainment. Because the volume of water required for the jet plow is very small compared to the volume of upper Little Bay, entrainment is unlikely to have a significant effect on the population.

Horseshoe crabs likely feed on the tidal flats along the Little Bay shorelines. Individuals located along the path of the jet plow would be impacted by the jet plowing. Those adjacent to the jet plow installation would be subject to deposition but would likely be able to extricate themselves from the unconsolidated sediments.

Fish

Impacts to fish will be temporary and include alteration of benthic habitat, exposure to increased levels of suspended sediments, and mortality of early

life stages entrained in the jet plow's water system. Available habitat for bottom-feeding (demersal) species will be temporarily disturbed and altered, slightly reducing the area available for use. Demersal species for which Essential Fish Habitat (EFH) has been designated in Great Bay that could be affected include: Atlantic cod, Atlantic halibut, red hake, white hake, windowpane flounder, winter flounder, yellowtail flounder, and pollock (semi-demersal). Disturbance of sediment during jet plowing will, however, expose some benthic infauna, which may attract demersal feeders. Demersal organisms attracted to the area would be exposed to increased suspended sediments, but the reduced efforts to capture prey could be beneficial energetically.

Highest concentrations of suspended sediments will be close to the seafloor adjacent to the trench being plowed. This could be a deterrent for some fishes, particularly mid-column (pelagic) species, and cause them to avoid the densest part of the plume. Pelagic species for which EFH has been designated in Great Bay include pollock (semi-demersal), Atlantic mackerel, and bluefish. The Little Bay crossing area may also provide nursery or staging habitat for diadromous species, including American eel, alewife, American shad, rainbow smelt, and sea lamprey. Given that duration of the highest densities in the plume are limited to about an hour per cable and the plume will never encompass more than about 10% of the width of the bay, it is not expected that these species would be impacted by exposure.

Early life stages of several species of fish could be vulnerable to being drawn into the water intake (entrainment) during jet plow operation, and are likely to be in the water column during cable installation. These include Atlantic cod, Atlantic mackerel, white hake, windowpane flounder, and yellowtail flounder. Given the very small volume of water required for the plow relative to the volume in Little Bay (0.17 to 0.27%), it is unlikely that entrainment will have a significant effect on these populations.

Birds

In the fall, the Great Bay Estuary typically hosts large numbers (>500) of migrating Canada geese and black ducks, as well as smaller numbers (<100) of other diving and dabbling ducks, and shorebirds. American bald eagles (state-Threatened) and osprey (state Special Concern) are fish-eating birds of prey that breed in Great Bay. Bald eagles are also present in Great Bay in the fall and winter. All of these species use a variety of habitats around the Bay and are not likely resource-constrained. Disturbance due to construction of the SRP during the fall time period would shift avian use away from the Project area, but resources for these species are available in other parts of the Bay. Post-construction, the SRP would have no impact on resources for migrating waterfowl, eagles and other resident bird species.

(5) Description of the measures planned to avoid, minimize, or mitigate potential adverse impacts of construction and operation of the proposed facility on wildlife species, rare plants, rare natural communities, and other exemplary natural communities, and on critical wildlife habitat and significant habitat resources, and the alternative measures considered but rejected by the applicant; and

Measures to avoid, minimize and mitigate potential adverse impacts of construction and operation of the proposed facility on wildlife species, rare plants, rare natural communities, and other exemplary natural communities, and on critical wildlife habitat and significant habitat resources are described above in Section 301.07(c)(4).

Design alternatives for the proposed route are described in Section 301.03 (h)(2). Design modifications to minimize natural resource impacts while balancing engineering design constraints and effects on historic, archeologic and aesthetic resources has been an integral part of the design process. The benefits of the proposed design to the natural environment include:

1. Use of an existing electric corridor to minimize tree clearing and other construction related disturbance.
2. Use of an existing charted Cable Area for crossing Little Bay to confine bottom disturbance to an area with existing cables and protected marine use (no anchoring, no shellfish harvesting).
3. Construction impact to the two largest streams, the Oyster River and Valentine Canal, are limited to minor tree clearing. An access road across the Oyster River was initially necessary because of railroad requirements, but has been avoided by collaborating with UNH to develop an access road from the south, which will ultimately become part of their College Woods trail system.
4. Multiple structures were shifted to avoid direct wetland impacts, and where possible, positioned to minimize temporary wetland impacts during construction.
5. Where temporary wetland impacts were unavoidable, the construction access roads and work pads were configured to be least impactful to the wetland.
6. Only one perennial stream is directly impacted (College Brook) during cable burial, and that impact is temporary. All other stream crossings are bridged with timber mats, except for three that require temporary culverts under work pads.

Design alternatives that were considered and rejected, in part, due to natural resource effects included:

1. Overhead construction across Little Bay was briefly evaluated but rejected in part due to permanent fill that would be required on the tidal flat of western Little Bay.
2. Horizontal directional drilling ("HDD") under Little Bay: This approach could minimize effects to natural resources in Little Bay, but would have disproportionately high terrestrial impacts. The staging areas for HDD would be

large in Durham and very large on the Newington side. Both would include a 24-hour industrial operation in a residential neighborhood, and in Newington, a laydown area that would potentially extend approximately one (1) mile to Nimble Hill Road and across a prime wetland. Additionally, a geologic fault under Little Bay elevated the risk of "frac-out" of clay drilling fluids, which if forced into Little Bay, would be very difficult to manage. The timeframe for HDD was projected to be 9 months versus the approximately one month for jet plowing. Other constraints of HDD, included cost, the very long, large bore, and logistics of vehicles, crews and disposal of drilling products made this technology clearly less desirable for SRP.

(6) Description of the status of the applicant's discussions with the New Hampshire department of fish and game, the New Hampshire natural heritage bureau, the United States Fish and Wildlife Service, and any other federal or state agencies having permitting or other regulatory authority over fish, wildlife, and other natural resources.

Multiple meetings with state and federal regulatory agencies have occurred as the Project design has progressed. These meetings were designed to inform agency personnel of the Project design, discuss pertinent issues, and respond to concerns and questions. A pre-application meeting to review the wetland, stream and wildlife resources and potential Project-related concerns was held on January 6, 2015 with the NHDES, NHF&G, NHNHB, USACE, USEPA, USFWS, and NMFS. Additional agency pre-application meetings have included one to introduce the Project to the NHDES project manager on February 25, 2015. A second meeting to discuss resources and Project activities in Little Bay was held on March 3, 2015 with NHDES, USACE, USEPA, and NMFS. A final multi-agency pre-application meeting was held January 12, 2016 with state and federal agencies. Attendees included NHDES Wetlands Bureau, Alteration of Terrain, and Water Quality staff, NHNHB; USACE; USEPA; USFWS and NMFS. The purpose of this meeting was to present the final permitting design, describe the Project community outreach efforts, and request any outstanding agency concerns.

Additional meetings have included: one meeting describing the Project and potential effects held on May 7, 2015 with NHF&G environmental review team; and an additional pre-application status meeting held on June 10, 2015 with NHDES and USACE. NHF&G held a meeting on September 17, 2015 to specifically provide information to, and address concerns of, oyster aquaculturists.

Additional communications with individual regulators occurred to ask or answer questions regarding the Project, including USACE, NHDES, NHF&G, USFWS and NHNHB. See Appendix 36 Summary of Outreach, which includes meetings with agency officials.

(7) Summary

The Applicant submits that the foregoing discussion, as supported by the pre-filed testimonies of Sarah Allen and Ann Pembroke, demonstrates that the Project will not

have an unreasonable adverse effect on air and water quality or on the natural environment.

Site 301.08 Effects on Public Health and Safety.

Each application shall include the following information regarding the effects of, and plans for avoiding, minimizing, or mitigating potential adverse effects of, the proposed energy facility on public health and safety:

(a) For proposed wind energy systems:

The Project is not a wind energy system; therefore, this section is not applicable.

(b) For electric transmission facilities, an assessment of electric and magnetic fields generated by the proposed facility and the potential impacts of such fields on public health and safety, based on established scientific knowledge, and an assessment of the risks of collapse of the towers, poles, or other supporting structures, and the potential adverse effects of any such collapse.

The Applicant has taken, and will continue to take, preventative steps to protect the health and safety of workers and the public during the construction and subsequent operation of the Project. The Applicant has designed the Project to adhere to company polices and the NESC requirements for transmission lines and have optimized the design of the proposed phase conductors to minimize levels of magnetic fields at the ROW edge. Moreover, the Applicant has designed the Project to limit any increase in sound beyond the edge of the ROW.

Prior to construction, the Applicant will develop and implement a project health and safety plan for all aspects of the work and will hire and retain qualified workers and contractors to construct the Project. A traffic officer or flagger will be on site to ensure the safety of the public and workers during construction and to minimize impacts to traffic. Once the Project is constructed, the Applicant will continue to adhere to PSNH's procedures and ISO-NE, state, and federal regulations relating to the safe operation of transmission lines.

(1) Electric[31] and magnetic[32] fields

Electricity used in homes and workplaces is transmitted over considerable distances from generation sources. Electricity is transmitted as AC to all homes and over electric lines delivering power to neighborhoods, factories, and commercial

[31] Electric fields are the result of voltages applied to electrical conductors and equipment. The electric field is expressed in measurement units of volts per meter (V/m) or kilovolts per meter (kV/m); 1 kV/m is equal to 1,000 V/m. Most objects, including fences, shrubbery, and buildings, easily block electric fields. Therefore, certain appliances within homes and the workplace are the major sources of electric fields indoors, while power lines are the major sources of electric fields outdoors.

[32] Magnetic fields are produced by the flow of electric currents, and are commonly expressed in units called gauss (G) or milliGauss (mG), where 1 G = 1,000 mG. The magnetic-field level at any point depends on characteristics of the source (e.g., a transmission line or a household appliance), including the arrangement of conductors, the amount of current flow through the source, and its distance from the point of measurement. The levels of both electric fields and magnetic fields diminish with increasing distance from the source.

establishments. The power provided by electric utilities in North America oscillates 60 times per second (i.e., at a frequency of 60 Hertz [Hz]).

Eversource calculated EMF levels in the vicinity of the Project ROW, both before and after construction. Prior to construction, calculated magnetic fields at annual average load (AAL) levels range from 0.27 mG to 22.83 mG at the edge of the ROW, while electric-field levels at average conductor height range from 0.02 kV/m to 0.90 kV/m. After the Project is placed into service, calculated magnetic fields at AAL levels are predicted to range from 0.48 to 22.74 mG at the edge of the ROW. In the vicinity of the cables underground (UG) or underwater, the calculated magnetic field drops below 35 mG within 50 feet of the center cable. Electric-field levels at average conductor height are predicted to range from 0.03 kV/m to 0.91 kV/m at the edge of the ROW. The results of Eversource's modeling can be found in the report titled *Electric and Magnetic Fields Summary – Seacoast Reliability Project*, Appendix 41, and are summarized in the tables below.

Table 3. Magnetic-field Levels (mG) during Average Annual Loads and Typical Conductor Height

Magnetic Field Calculations (mG)							
Line Section		Average Annual Loads					
		Pre-Project			Post-Project		
From	To	- ROW Edge	Maximum	+ ROW Edge	- ROW Edge	Maximum	+ ROW Edge
Madbury S/S	Route 4 Xing	2.29	31.12	2.03	1.44	32.05	5.52
Route 4 Xing	UNH	1.61	31.12	5.46	1.77	32.43	3.98
Underground Through UNH Parking Lot		9.73	31.95*	1.12†	9.75	31.77*	1.50†
UNH	Durham S/S	3.30	19.45	3.30	4.24	17.77	2.24
Durham S/S	Packers Falls S/S	3.30	19.45	3.30	1.25	17.77	0.86
Packers Falls S/S	Newmarket Rd	1.85	29.50	16.58	4.24	17.77	2.24
Newmarket Rd	Durham Point Rd	0.27	1.60	0.27	4.00	8.48	4.44
Durham Point Rd	Little Bay Launch	0.00	0.00	0.00	5.14	17.63	5.91
Little Bay Launch	Little Bay Xing	0.00†	0.00	0.00†	0.48†	24.43	0.48†
Little Bay Xing		0.00†	0.00	0.00†	31.43†	98.52	31.43†
Little Bay Landing	Little Bay Rd	0.00†	0.00	0.00†	0.48†	24.43	0.48†
Little Bay Rd	Fox Point Rd	4.54	26.77	4.54	8.37	29.60	8.37
Fox Point Rd	Spaulding Turnpike Xing	4.54	26.77	4.54	7.80	32.41	5.88
Spaulding Turnpike Xing	Crossing at Fox Run	0.00	0.00	0.00	5.14	17.63	5.91
Crossing at Fox Run	Portsmouth S/S	8.38	81.26‡	22.83	4.86	81.86‡	22.74

* Underneath existing distribution Line

† For sections of UG cable which are not within existing Eversource ROWs, calculations are at 50 feet from the transmission line

‡ Underneath the Existing 345-kV Transmission Line and not within 100 feet of proposed transmission line

Table 4. Electric-field levels (kV/m) at Typical Conductor Height

Electric Field Calculations (kV/m)							
Line Section		Pre-Project			Post-Project		
From	To	- ROW Edge	Maximum	+ ROW Edge	- ROW Edge	Maximum	+ ROW Edge
Madbury S/S	Route 4 Xing	0.02	0.26	0.02	0.03	1.07	0.32
Route 4 Xing	UNH	0.06	0.24	0.06	0.18	0.19	0.15
Underground Through UNH Parking Lot		No Electric Fields from UG Cables					
UNH	Durham S/S	0.06	0.24	0.06	0.18	0.19	0.15
Durham S/S	Packers Falls S/S	0.06	0.24	0.06	0.18	0.19	0.15
Packers Falls S/S	Newmarket Rd	0.09	0.29	0.24	0.21	0.22	0.16
Newmarket Rd	Durham Point Rd	0.06	0.24	0.06	0.18	0.19	0.15
Durham Point Rd	Little Bay Launch	0.00	0.00	0.00	0.30	1.05	0.26
Little Bay Launch	Little Bay Xing	No Electric Fields from UG Cables					
Little Bay Xing							
Little Bay Landing	Little Bay Rd						
Little Bay Rd	Fox Point Rd	0.06	0.24	0.06	0.53	1.20	0.53
Fox Point Rd	Spaulding Turnpike Xing	0.06	0.24	0.06	0.23	1.00	0.40
Spaulding Turnpike Xing	Crossing at Fox Run	0.00	0.00	0.00	0.42	1.51	0.37
Crossing at Fox Run	Portsmouth S/S	0.26	4.14†	0.90	0.05	4.16†	0.91

† Underneath the Existing 345-kV Transmission Line and not within 100 feet of proposed transmission line

There are no regulations concerning EMF in the State of New Hampshire or mandated by the federal government. However, some nationally and international scientific bodies, including the International Committee on Electromagnet Safety ("ICES") (a committee of the Institute of Electrical and Electronics Engineers ("IEEE")), and the International Council on Non-Ionizing Radiation Protection ("ICNIRP") (affiliated with the World Health Organization ("WHO")) have recommended Basic Restrictions (standards) for public exposure to EMF. Under all operating conditions, the calculated EMF levels resulting from the Project are well below the exposure levels corresponding to these Basic Restrictions summarized in the Table 5 below.

Table 5. Exposure Levels Corresponding to Basic Restrictions of ICES and ICNIRP[33]

	ICES	ICNIRP
Electric Field (kV/m)	26.8	36.4
Magnetic Field (mG)	9,150	12,400

In addition, Eversource requested that Exponent prepare a review of the status of scientific research on EMF and health. See *Current Status of Research on Extremely Low Frequency Electric and Magnetic Fields and Health*, Appendix 40. Neither the conclusions reached by scientific and public health agencies nor Exponent's review of the most recent studies provides evidence to alter the conclusion that ELF EMF exposure at the levels we encounter in our everyday environment including from transmission lines is not a cause of cancer or any other disease process.

(2) Assessment of the risks of collapse of the towers, poles, or other supporting structures, and the potential adverse effects of any such collapse.

PSNH proactively mitigates the risks associated with the collapse or failure of overhead transmission line elements during the course of engineering and throughout the facilities' lifecycle. The occurrence of a transmission line structure failure is a rarity and as such the potential for adverse impact is minimal.

Understanding the methods employed by engineers to mitigate the risk associated with failure of transmission line elements requires a basic understanding of how an overhead electric transmission line (transmission line) behaves mechanically. Transmission line structures are often grouped into categories with those utility structures supporting wind turbines and cellular antennas. The major difference between the structural system attributed to a transmission line and those structural systems associated with wind turbines or cell towers is that the structural system for a transmission line is composed of two distinct subsystems consisting of the wires (shield wire and conductor) and structures. The wires and structure act together as a system and as a result, limit the failure of a transmission line structure. In the unlikely event a structure fails, the wires prevent the total collapse of the structure.

The majority of the structural loading is associated with the wire system. The conductors and shield wires associated with a particular circuit are subject to wind, ice, and changes in temperature. As such, the design considerations utilized by PSNH take into account a variety of different loading conditions as outlined in governing code (National Electrical Safety Code, 2012 Edition) and based on internal company

[33] ICNIRP and ICES exposure limits are based on internal doses (electric fields inside the human body directly related to observed neurostimulatory effects) that should not be exceeded; these limits are called Basic Restrictions. Since internal doses are difficult to measure, Reference Levels or Maximum Permissible Exposures are also set for environmental exposures (2,000 mG and 4.2 kV/m for ICNIRP; 9,040 mG and 10 kV/m within the ROW for ICES). If Reference Levels or Maximum Permissible Exposures are not exceeded, it guarantees that the Basic Restrictions are also met. If environmental exposures, however, exceed the Reference Levels that does not mean that the Basic Restriction is exceeded; rather it means that additional dosimetric determination is needed, such as that performed in conjunction with Kavet et al. (2012).

standards that have been developed based on previous extreme weather conditions encountered during operation over the past 100 years. These loading conditions include, but are not limited, the following:

- NESC Heavy Loading (250B)
- NESC Extreme Wind (250C)
- NESC Extreme Ice with Concurrent Wind (250D)
- Eversource Heavy Ice

Recognizing that there are some events that cannot be predicted or prudently incorporated into the engineering considerations utilized for the design of a transmission line, PSNH employs practices to minimize risks should the failure of a structural element occur. The American Society of Civil Engineers ("ASCE") Manual and Report on Engineering Practice No. 74 "Guidelines for Electrical Transmission Line Structural Loadings" has several recommendations for mitigating the risks associated with both exceeding the anticipated loading conditions as well as the loss of a structure. These recommendations include the installation of structures designed to withstand heavy longitudinal loads at periodic intervals along the length of a line to limit the potential length of cascading failures, designing suspension structures to withstand differential or broken wire cases, and using historic weather data and events to create specific loading conditions reflective of what a circuit may be subject to over its life should those loading conditions not be characterized by the base loading conditions defined by the NESC. PSNH employs the practices outlined above to provide a cost efficient and reliable design. In addition, all supporting structures have been designed to comply with Grade B construction as outlined in Section 24 of the 2012 NESC, which is the most robust design category contained in the NESC. Overload factors and factors of safety are incorporated based on sound engineering practice as another mitigation measure so that in the event that these loading conditions are exceeded transmission line structures have the ability to maintain their integrity.

The mode of failure associated with a transmission line structure collapse is dependent upon a number of different factors. These considerations include the condition of the structure, types of load imposed by the wire system at the time of failure, fixity of wire attachments and their location on the structure, foundation type, and ground line conditions. Transmission line structures can also be designated as having failed without catastrophic collapse occurring. Any deformation state above the recoverable limit of an element is considered as having failed and would be proactively addressed.

In instances where transmission line structures have failed catastrophically, the collapse pattern is seldom one in which a single or multiple pole structure fails about the base creating the potential for a radial zone of impact. Rather, these failures tend to result in the failed structure buckling and failing within its original footprint or being pulled in along the line of the wire with the point of deformation located above ground line. Given the footprint of those structures proposed on the project and their

placement, should a structure fail, there is a very high degree of probability that any and all elements will remain within the bounds of the right-of-way, mitigating the potential adverse impact associated with such a failure.

In addition to the engineering considerations utilized by PSNH to mitigate the risk associated with structure collapse, PSNH has a robust inspection and maintenance programs that call for the inspection of transmission facilities on a cyclical basis to make sure that any deterioration of assets is proactively addressed before it becomes an issue. These inspections are conducted in the form of aerial patrols (via helicopter) and walking inspections.

Lastly, should a structure fail, the system is configured with relaying systems that detect faults and de-energize the line. PSNH has internal work forces that can be deployed quickly to address any failures as well as a wide spread network of contract line workers who can be engaged to assist when an event occurs. Materials necessary for the restoration of a collapsed structure are stored in the event of an emergency and can be deployed rapidly once a solution to a tower failure has been developed.

(c) For all energy facilities:

(1) Except as otherwise provided in (a)(1) above, an assessment of operational sound associated with the proposed facility, if the facility would involve use of equipment that might reasonably be expected to increase sound by 10 decibel A-weighted (dBA) or more over background levels, measured at the L-90 sound level, at the property boundary of the proposed facility site or, in the case of an electric transmission line or an energy transmission pipeline, at the edge of the right-of-way or the edge of the property boundary if the proposed facility, or portion thereof, will be located on land owned, leased or otherwise controlled by the applicant or an affiliate of the applicant;

The Project is not expected to increase sound by 10 decibel A-weighted (dBA) or more over background noise levels at the property boundary of the site or at the edge of the ROW. The Project is designed and will be constructed to meet the safety requirements of the National Electrical Safety Code (NESC, 2012) and Eversource Energy policies on transmission line spacing on ROW.

Corona effects from a transmission line may manifest themselves as audible noise, radio interference, and television interference. Corona effects, including sound, typically become a design concern for transmission lines at 345 kV and above and are less noticeable from lines that are operated at lower voltages, such as this proposed 115 kV transmission line. The proposed new line from Madbury to Portsmouth will be operated at well below the 345 kV threshold level.

The Project is not expected to impact radio noise. Only AM receivers that are tuned to a weak station and are located next to transmission lines have the potential to be affected by radio interference. FM radio receivers usually do not pick up interference from transmission lines, because corona generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM

broadcast band (88 to 108 megahertz). There should be little to no FM radio interference from the Project.

In addition, the Project is not expected to have any unreasonable impacts with television reception. Interference with over the air television reception from transmission lines typically occur with transmission lines of 345 kV or greater and only for receivers within 500 feet of the line. As SRP is 115 kV, television interference is not expected.

(2) A facility decommissioning plan prepared by an independent, qualified person with demonstrated knowledge and experience in similar energy facility projects and cost estimates; the decommissioning plan shall include each of the following:

The Applicant does not anticipate the need to decommission the new transmission line. Such lines are typically rebuilt, as needed, and continue in service indefinitely. If at some time in the future it is determined that the Project needs to be decommissioned, the Applicant would, at that point, add this Project to their respective business plans, and would begin collecting future decommissioning costs through the FERC-approved transmission tariff.

In the very rare instance that a transmission line were decommissioned and completely removed, the Applicant would follow a process similar to the initial line construction. In general, the Applicant would include this Project in their business plan, assign a project manager, and sanction the expenditure of funds to initiate preliminary engineering, permitting and site investigation activities, including, for instance, the identification of access points, required environmental testing or monitoring, and disposition of the materials. The Applicant would secure the required permits as well as any necessary access rights. After the electrical facilities are retired, the underlying ROW will remain an asset for the utility and will not be relinquished.

This level of detail for a decommissioning plan for a transmission line is reasonable at this stage. A more detailed decommissioning plan for the F107 Line would need to take into account any changes to that line and other lines in the ROW that may have changed over time as well as all applicable laws and regulations that exist at the time of decommissioning. Given that transmission lines are frequently rebuilt and reconductored, it is unlikely that any plan developed now could be implemented as written 50 or even 100 years from now.

The Applicant will submit to the Committee a complete decommissioning plan prior to initiating the removal of the Project, should decommissioning be required. The decommissioning plan will provide details of each element of the Applicant's plan to decommission the Project, consistent with then-current environmental, safety, and other regulatory requirements. As regulated public utilities and transmission owners, the Applicant has experience in the construction, upgrade, and removal of transmission facilities.

The Applicants are also seeking a partial wavier of Site 301.08(c)(2).

a. A description of sufficient and secure funding to implement the plan, which shall not account for the anticipated salvage value of facility components or materials;

Please see the Pre-Filed Testimony of Michael Ausere for a description of the secure funding to implement a decommissioning plan.

The Applicants further state that under the Federal Energy Regulatory Commissions' ("FERC") Uniform System of Accounts, decommissioning is considered an asset retirement obligation. Under this system, over the useful life of the asset the Applicants recover money that is used to fund an account dedicated to asset retirements. While money is not dedicated to the retirement of specific assets, like the F107 this system ensures that funds are always available for any retirements that may occur in a given time period.

b. The provision of financial assurance in the form of an irrevocable standby letter of credit, performance bond, surety bond, or unconditional payment guaranty executed by a parent company of the facility owner maintaining at all times an investment grade credit rating;

The Applicant requests a waiver from providing such financial assurance in the form of an irrevocable standby letter of credit, performance bond, surety bond, or unconditional payment guaranty executed by a parent company of the facility owner maintaining at all times an investment grade credit rating. See Joint Applicants' Motion to Partially Waive Site 301.08(c)(2). Under the FERC Uniform System of Accounts, the Applicants will recover money used to fund an account to retire the Project, if necessary.

c. All transformers shall be transported off-site; and

The construction of Line F107 does not include the installation or addition of any new transformers. Because the Applicants will not construct any new transformers as part of this Project, Site 301.08(c)(2)(c) is inapplicable and the Applicants request that this rule be waived in its entirety.

d. All underground infrastructure at depths less than four feet below grade shall be removed from the site and all underground infrastructure at depths greater than four feet below finished grade shall be abandoned in place;

Please see Joint Applicants' Motion to Partially Waive Site 301.08(c)(2).

(3) A plan for fire safety prepared by or in consultation with a fire safety expert;

The Applicant does not, in the ordinary course of business, develop specific fire safety plans for its individual ROWs. Electric transmission substations and ROWs are typically unoccupied during operation, so there are no personnel to evacuate. Any fire that might occur at a substation or the ROW once the Project is in operation would be initially addressed by the local fire department; the Applicant will respond pursuant to their Electric Operations Emergency Response Plan, provided in 301.08(c)(4).

During construction, emergency response (including response to fires) will be documented daily on the tailboard and addressed daily at the morning safety meeting. PSNH does not plan to engage in live line construction on this Project; therefore, the work presents no fire safety hazards beyond those typically associated with construction projects. If a fire breaks out on the ROW while workers are present (either during construction or during future maintenance activities), workers would evacuate to the muster point established at the daily tailboard session and call the local fire department.

(4) A plan for emergency response to the proposed facility site; and

Please see Appendix 42 for the Eversource Energy Emergency Response Program, New Hampshire Electric Operations Emergency Response Plan, dated March 5, 2015.

(5) A description of any additional measures taken or planned to avoid, minimize, or mitigate public health and safety impacts that would result from the construction and operation of the proposed facility, and the alternative measures considered but rejected by the applicant.

The following is a description of additional measures taken by the Applicant to avoid, minimize or mitigate public health and safety impacts from the construction and operation of the Project as it relates to traffic safety, the crossing of locally maintained highways, the design of the Project, the safe delivery of equipment and materials to the site, protection of the public and workers during construction, security measures during construction to protect workers, equipment and material, and blasting.

a. Traffic Safety During Construction

Construction of the Project is expected to have minimal impact on the traveling public. The Project will incorporate traffic safety plans to ensure public and worker safety throughout the duration of the construction. The Project has retained a certified transportation engineer to study the Project's potential impact on traffic and suggest methods to minimize Project effects to traffic. PSNH and all contractors will also follow standard procedures and practices for wearing the necessary personal protection equipment ("PPE") during all phases of the Project. All traffic controls will be in accordance with the 2009 edition of the Manual on Uniform Traffic Control Devices ("MUTCD") [34] and NHDOT policies. For additional information, please see the Pre-Filed Testimony of Lynn Farrington and the related traffic control plans referenced below.

The Project will require 21 road crossings, including one single crossing of the Spaulding Turnpike and crossings over two (2) Spaulding Turnpike ramps, four (4) other State-maintained crossings, and 14 locally-maintained crossings. One local crossing in Durham, Main Street, will be underground cable but not require any excavation of the roadway. Police or flaggers will be available to stop traffic

[34] *Manual on Uniform Traffic Control Devices*, published by Federal Highway Administration, 2009 Edition.

to provide up to eight minutes of road closure while lines are pulled across the roads. Permitting requirements and traffic control plans for State-maintained crossings and related NHDOT permits are presented in Appendix 17 titled: *NH Department of Transportation Applications*.

b. Crossing of Locally Maintained Highways

The Applicant is requesting that the Certificate of Site and Facility for the Project include the rights to install an electric transmission line, including related conduit, cable, wires, poles, structures and devices across, over, and along 14 locally-maintained roadways. See Appendix 18 titled: *Overhead and Underground Municipal Highway Crossings*. Two locally-maintained crossings in Newington will be underground cable and require excavation of the roadway. The underground crossing of Main Street in Durham will be constructed using a "pipe jacking" method approximately 22 feet below the roadway. Crossings over 11 local roads will be overhead construction. The SEC has exclusive authority to issue a Certificate of Site and Facility, and therefore, also to grant authority to an energy facility within the SEC's jurisdiction to cross locally-maintained highways within municipalities.[35] Utilities of all varieties, including power lines, have long been recognized as appropriate users of public highways, so long as the facilities do not conflict with the general public's vehicular use.[36]

In addition, utility companies may locate poles, lines, cables and entrances to access roads, within and across roads, provided they will not interfere with the safe, free and convenient use for public travel of the highway.[37] The NHDOT has adopted certain standards concerning these utilities in its *Utility Accommodation Manual* ("UAM"), dated February 24, 2010. This filing constitutes notice of these proposed crossings and locations in accordance with the procedures set forth in the UAM Appendix G-3.1-2.

The Applicant seeks approval from the SEC to install the Project along, over, across, under and within locally-maintained highways as set forth in the testimony of David Plante, James Jiottis, and Lynn Farrington. This request to construct the Project along, over and across locally-maintained highways includes a typical traffic control detail and will comply with NHDOT standards for state-maintained highways. As explained in the testimony and Appendix 18, the Applicant's proposal will not interfere with the safe, free, and convenient use for public travel of the locally-maintained highways. As a result, there will be no unreasonable adverse effect on public safety.

[35] *See generally Public Service Company of New Hampshire v. Town of Hampton,* 120 N.H. 68 (1980).

[36] The New Hampshire Supreme Court has made it clear that the authority to license placement of power lines, poles and underground conduit within highways is regulatory in character and must be exercised in a non-exclusionary and reasonable manner. In *Rye v. Public Service Company of New Hampshire*, 130 N.H. 365 (1988), the Court found that a crossing application may be denied only for a public safety-based reason.

[37] Utility companies may locate poles, lines, and cables within and across roads, provided they will not interfere with the safe, free and convenient use for public travel of the highway. RSA 231:168. The authority to erect electric transmission lines and underground cables in state and local highways is codified at RSA 231:160.

c. Construction

PSNH has designed and will construct, install, operate, and maintain the Project in accordance with the NESC and all ISO-NE guidelines and standards to safeguard public health and safety. As described more thoroughly in Section 301.03 (g)(9) and the Pre-Filed Testimony of David L. Plante, PSNH has several safety practices that PSNH will utilize throughout the construction process as well as during the operation and any necessary maintenance associated with the Project.

d. Safe Delivery of Equipment and Materials to Site

Construction equipment and materials for the new line will be brought to Project work areas, including marshalling yards, utilizing public roads. The Project construction contractor(s) will be responsible for safely moving materials to individual laydown areas. Oversize vehicles or loads may require escorts and/or permits obtained by construction contractor(s). Off-road equipment will be delivered by flatbed trailer to roadside locations for travel into and along the Project corridor. Appropriate traffic control measures (e.g., sign packages, flaggers and/or police details) may be required if public roadways are expected to be encumbered during delivery of equipment and material.

Substation materials will be delivered directly to the substation sites in Madbury and Portsmouth or Transmission Storeroom at Legends Drive in Hooksett. Materials needed for construction of the submarine cable will be delivered by the manufacturer to a local seaport. The local port will either be a commercial seaport in Newington, NH or the Schiller Station.

All traffic controls will be in accordance with the MUTCD and NHDOT policies.

e. Protection of the Public and Workers during Construction

Safety is of the utmost importance to the Applicant. A Project safety plan will be developed and incorporated into all contractor agreements. Contractors will be required to comply with all applicable safety regulations and standards; to conduct daily morning crew meetings to discuss that day's activities and potential hazards; and to perform and document site and equipment inspections.

Qualified management and staff with experience on similar projects will perform contractor inspections, audits and oversight throughout the construction process. Field observations will be taken and used to identify safety trends occurring on the Project. This information will be communicated through project-wide safety bulletins and formal notices to the contractors. In addition, field safety observations will be reviewed and discussed as part of recurring project team meetings.

The Applicant will require that all construction contractors and field personnel be trained in Safety/Occupational Health and Safety Administration (OSHA),

Basic First Aid/CPR, Environmental Compliance and other relevant topics. In addition, the Applicant will provide Project-specific training.

f. Security Measures during Construction to Protect Workers, Equipment and Material

The contractor is responsible for planning and executing their construction activities so as to ensure the security of workers, equipment and materials. Security measures to discourage theft and vandalism may include fencing, storage of materials in lockable containers, lighting, cameras, and employment of a security firm for overnight security. Construction equipment will likely be left in the ROW overnight. When this is done, the equipment typically will be moved to a nearby road crossing for visibility to local police patrols and to avoid vandalism to the equipment. If a security concern is identified for any workers on the Project, the Applicant's security personnel will work with local law enforcement to prepare a plan for personnel security.

g. Blasting

As described in Section 301.03 (g)(9) above, blasting may be required in certain situations where the construction team encounters shallow-to-bedrock soil depths and subsurface boulders. In these instances, PSNH will retain a blasting contractor, who will perform the limited amount of blasting required. All blasting will be done in accordance with applicable local, state, and federal permitting requirements regarding blasting and the safe handling of explosives to ensure the safety of the public and the workers. Town officials and abutting landowners will be notified in advance of such activity.

h. Alternative measures considered but rejected by the applicant

The Project has been designed and planned to avoid, minimize, or mitigate public health and safety impacts that would result from the construction and operation of the Project. No alternative measures were considered by the Applicant and rejected.

(d) Summary

Based on the foregoing discussion, as supported by the Pre-Filed Testimony of William Bailey, Dave Plante, James Jiottis, Lynn Farrington and Michael Ausere, the Project will not have an unreasonable adverse effect on public health and safety.

Site 301.09 Effects on Orderly Development of Region.

Each application shall include information regarding the effects of the proposed energy facility on the orderly development of the region, including the views of municipal and regional planning commissions and municipal governing bodies regarding the proposed facility, if such views have been expressed in writing, and master plans of the affected communities and zoning ordinances of the proposed facility host municipalities and unincorporated places, and the applicant's estimate of the effects of the construction and operation of the facility on:

(a) Land use in the region, including the following:

(1) A description of the prevailing land uses in the affected communities; and

The Project will be located within and along an existing electric line corridor. The corridor was originally developed for electric utility purposes in the early to mid-20th century, and the distribution lines sited in the corridor have been actively upgraded and maintained. In the latter half of the 20th century and into the early 2000's, the four communities along the corridor experienced large increases in growth, as did most of southern New Hampshire. Neighborhoods, homes and businesses were developed adjacent to or near the Project corridor.

The prevailing land uses adjacent to the corridor include forests, agriculture, residential, commercial/industrial, recreation, transportation and utilities, conservation, historical and archaeological, wetlands and water resources, wildlife habitat, and institutional/government.

Forests located within or along the corridor are periodically harvested for timber. There are only a few agricultural uses within or near the corridor which are generally used for hay, pasture or corn. Residential development along the corridor is primarily low density single family dwellings scattered along existing road frontages, and moderate density suburban single family neighborhoods built around cul-de-sac roads.

Commercial and industrial land uses along the corridor are primarily located east of the Spaulding Turnpike in Newington and Portsmouth. In Durham, the area near the Amtrak Station/A-Lot includes the Dairy Bar, a dining establishment, and is identified in the UNH Master Plan as a potential location for future mixed use.

Conservation and open space parcels are located along the corridor, and provide recreational uses which include hiking, biking, and walking. The Project corridor pre-dates most of these parcels. There are no new trail crossings associated with the Project. The Project corridor crosses bike routes identified by the NHDOT in Durham and Newington, and a recreation bike loop connecting Durham and Newmarket. All of these crossing locations are within the existing utility corridor. The Project crosses transportation and utility corridors all within the existing corridor. The Project spans the state-designated Oyster River within the existing utility corridor crossing.

In summary, the Project is located along an existing utility corridor and maintains and reinforces the prevailing land use pattern within each town and the region. Please also see Appendix 43, *Review of Land Use and Local and Regional Planning, The Seacoast Reliability Project*, for more detailed information.

(2) A description of how the proposed facility is consistent with such land uses and identification of how the proposed facility is inconsistent with such land uses;

The use of an already developed corridor minimizes impacts to existing land uses and is a sound development siting principle.

The Project's impacts on local land use during construction and operation will be minimal. The Project's potential impacts on local land use during construction will be temporary and include construction and traffic-related noise, traffic diversion, site work, clearing of vegetation, use of lay down areas for equipment, installation of erosion control, dust control, excavation, use of heavy equipment, temporary wetland crossings, and other associated construction activities. These activities will comply with BMPs as well as with all state and federal permit requirements. The Applicant will work with nearby residents, property owners, UNH, and local and state agencies prior to and during construction. The long-term operation of the Project will not change or interfere with existing or future local land use patterns.

The Project is generally consistent with the goals and strategies of local and regional long-range plans and will not unduly interfere with the orderly development of the region. The Project will ensure the reliability of electric service in the region and will use existing corridors and underground segments so as to minimize the impact on local land use patterns.

The SEC has previously found that utilizing pre-existing corridors is consistent with the orderly development of the region because it maintains current development patterns and minimizes impacts to local land use.[38] Because the Project is primarily located within and along a pre-existing electric utility corridor, it minimizes impacts to local land use and is thus consistent with the SEC's prior findings. The presence of the utility corridor containing electric utility structures has not impacted the residential and commercial growth that has occurred adjacent to and near to the corridor over the past few decades. The Project is consistent with the goals of local and regional plans, and will not interfere with their implementation. The Project will ensure the reliability of electric service, follows existing corridors so as to minimize impact on local land use patterns, and is consistent with the orderly development of the region.

The Applicant has considered information from local and regional planners, planning commissions and municipal governing bodies (as expressed in local and regional

[38] *See* Decision in Portland Natural Gas Transmission System Maritimes & Northeast Pipeline Company, SEC, Docket No. 96-01 and Docket No. 96-03 (July 16, 1997); Findings of the Bulk Power Facility Site Evaluation Committee, SEC DSF 850-155 (Sept. 16, 1986).

master plans and in other long range planning documents and local ordinances), as well as public comment from planning boards and boards of selectmen.

The Project also considered effects on local land use, economy, employment, tax revenues, tourism and recreation, and concluded that the Project would not unduly interfere with the orderly development of the region.

a. Project Consistency with Regional Plans

The Project will not unduly interfere with the orderly development of the region. The region for this Project consists of portions of two regional planning commissions, the Strafford Regional Planning Commission and the Rockingham Planning Commission. Each region's long-range planning documents were reviewed to understand the respective development goals and policies, and the effects of the Project on the orderly development of the region. In addition to regional plans, local master plans and zoning ordinances were also reviewed.

The Project is generally consistent with the general goals and strategies of local and regional plans, and will not interfere with their implementation. The regional plans for both the Strafford Regional Planning Commission and the Rockingham Planning Commission contain goals, data and analysis for the long term future of the regions. Both plans discuss energy in general terms, but the chapters are not directly applicable to the Project. However, they do note the need for more reliable energy in the region. The Project will help to meet this need, and follows existing corridors so as to have the least amount of impact on local land use patterns, which is consistent with the orderly development of the region.

b. Project Consistency with Municipal Plans

The Project is consistent with the goals of local master plans and zoning ordinances because it will be located within and along already existing corridors that pre-date much of the development in the communities. Master plans cite the desire for new development to occur within or adjacent to already developed areas in order to protect open space and minimize impacts from development. While most master plans are general in nature and focus on long-range planning policies such as "maintaining rural character," the Town of Newington recently amended the Utility Easements section of the 2009 Newington Master Plan specifically in response to the Project.

The Newington Planning Board made a sudden revision to the Utility Easement section of its master plan in February, 2015 shortly after the Project was presented to the town. This section continues to note that "while planning for future development, easement restrictions obviously need to be taken into account" (page 25). It also explains that electric lines run within a "protective easement" of about 300 feet for 345 and 115 kV lines and 100 feet for 34.5 kV lines. The new revision in February 2015 on page 26 incorrectly asserts that any utility towers above 65 feet would have considerable negative impacts on views from many homes and on property values. It also suggests a preferred alternative route, which would require new/additional easements and ROW's across Little

Bay, the Great Bay National Wildlife Refuge and along the northwest boundary of the Pease Development Authority property. The Applicant does not have property rights to cross these state lands and waters and the federal wildlife refuge as proposed by the town. For additional information, please see the Pre-Filed Testimony of James Jiottis.

The Applicant has considered a number of different alternatives and determined that the Project as proposed maximizes the use of existing corridors, minimizes the need to acquire new land rights, minimizes impacts to densely populated areas, and minimizes adverse impacts to environmental, cultural, and scenic resources. Specifically, in the Town of Durham, the line will be placed underground crossing Main Street, along the railway and in the vicinity of the Whittemore Center, the Amtrak Station/Dairy Bar, and the Field House/Cowell Stadium. In the Town of Newington, the Project has located the line underground in the Gundalow Landing area, including an underground crossing of Little Bay Road. In addition, the Applicant has proposed to reconfigure the existing distribution lines and to reduce structure heights in portions of Durham and Newington. The Project preserves local land use patterns, will not interfere with the implementation of other local master plans and is consistent with the policies and spirit of the planning process in that it will address immediate and long-term development objectives and will not unduly interfere with the orderly development of the region.

c. Public Input

In addition to consideration of information from the local and regional planning commissions and municipal governing bodies described above, the Applicant considered input received during the required pre-filing public information sessions.

1. Local Outreach Meetings

Beginning in late 2013, the Applicant began reaching out to the municipalities along the proposed route to introduce the need and proposed scope of the Project. These initial meetings were followed by more than 100 Project briefings throughout the Seacoast Region to inform and engage key stakeholders including, but not limited to: the Seacoast municipalities along route, other municipalities in the region, the Congressional Delegation, the State Legislature, the University of New Hampshire, Seacoast Chambers and Businesses, Pan Am Railways, Great Bay National Wild Life Refuge, Great Bay Resource Protection Partners, NHDES, NHDOT, NH Department of Safety, NHF&G, NHDRED, NHNHB, State and Federal Natural Resource Agencies, USACE, USFWS, USEPA, NMFS, The Nature Conservancy, the Oyster River Local Advisory Committee, the Lamprey River Advisory Committee, and NH oyster farmers.

PSNH engaged in discussions about the Project with municipal officials and local planners from Madbury, Durham, Newington, and Portsmouth. Meetings were also held with staff from the Strafford, Rockingham and Southern New Hampshire Planning Commissions, as well as with the Strafford and Rockingham County Commissioners.

As part of this extensive outreach, more than 10 meetings were open to the public, including meetings held with local Planning Boards, Boards of Selectmen, Conservation Commissions and Planning Commissions. At these meetings, the Applicant presented Project specific information to the public, municipal officials and/or local committees and stakeholders. Also, in response to public feedback and questions, company representatives provided additional information, route and line design details, alternative route analysis information, environmental impacts, mitigation plans, community outreach activities, and scheduling.

A comprehensive list of outreach meetings can be found in the Seacoast Reliability Project Outreach Summary, Appendix 36.

2. Pre-Filing Sessions

Following specific notice [39] to municipal officials and other elected representatives, to residents living along and near the Project route, and to other interested parties, the Applicant hosted public open houses directly prior to the SEC public information sessions held in Rockingham and Strafford Counties.[40]

During the open houses, members of the public had the opportunity to talk one-on-one with Project representatives and subject matter experts and to obtain informational materials. Several informational kiosks were available for individual discussion on various Project-related subjects, including the fundamentals of electricity delivery, the need for the Project and its benefits, Project environmental impacts, and how to participate in the siting process. Route locators were set up to help the public identify the proposed structure and line locations, along with the ROW and abutting property boundaries.

The open house portion of the evening was immediately followed by a public information session which began with the presentation of a Project video and a brief presentation from the Applicant. At the Durham public information session, the presentation was followed by a moderated public

[39] Legal notices for the public information sessions were placed in the Union Leader, the Portsmouth Herald, and Foster's Daily Democrat on April 3, 2015. Paid advertisements were also placed in the local newspapers to further inform the public of the upcoming public information sessions. The notices included information concerning the date, time, location and purpose of the sessions.

[40] Each session was held from 5:30 pm to 9:00 pm. The Strafford session was held in Durham at the Oyster River High School on April 22, 2015. The Rockingham session was held in Newington at the Newington Town Hall on April 23, 2015.

comment period, which was transcribed and is being provided to the SEC as part of the Application. Based on some comments made at the public information session, the Applicant modified the format of the Newington public information session that included a moderated question and answer period during the public comment period, which was transcribed and is being provided to the SEC as part of the Application. In addition, at the request of the Town of Durham, PSNH held a subsequent public presentation and question and answer session was held at the Durham Town Hall on June 22, 2015. The session was broadcast live on Durham Cable Access Television, and many residents emailed inquiries to the Durham Town Manager for Eversource to answer during the session.

3. Continued Outreach Following Public Information Sessions

Since holding the Public Information Sessions in April, the Project has continued to work with local municipal officials and more than 80 residents to respond to questions or concerns and gather feedback. This extensive outreach to residents and continued consultation with municipal officials resulted in nearly 20 revisions to the proposed line design that accommodates and responds to public feedback as described below.

Madbury

Town officials in Madbury presented concerns regarding structure heights near the substation and in the vicinity of Madbury Road. The Project acquired additional property and an easement adjacent to the railroad, which resulted in the elimination of two structures and reduced structure heights for the remaining structures.

Durham

Durham town officials and staff from the University of New Hampshire ("UNH") met with the Project team biweekly to discuss the Project design and opportunities to revise the design to accommodate public feedback, which focused on the height of the new structures and viewscape concerns from various locations along the corridor.

PSNH has contracted to acquire additional easements between Madbury Road and Route 4 and adjacent to the railroad on UNH property, which will eliminate structures and reduce the original structure heights.

The Main Street crossing on the UNH campus was a significant area of concern which is also viewed as the gateway to Durham. The original overhead design across Main Street was revised to an underground design from the northern parking lot just past the new football stadium. The Project design incorporates future plans for UNH to build a North and South Drive as well as undergrounding a portion of their steam pipe system therefore avoiding any future design conflicts. The Project Team will coordinate time of year construction to minimize impacts to university

activities such as commencement and the opening of the new football stadium.

In addition, PSNH modified its design in a number of other locations to optimize the design. For example, some structure locations at the Mill Road, Route 108 and Durham Point Road crossings were relocated to set them farther from the road to reduce their visibility. At Durham Point Road, one structure was redesigned and relocated to also help reduce the amount of the vegetative buffer that will need to be removed. The Project Team will also be able to address concerns of crossing Oyster River during construction by contracting to obtain a new easement to avoid the original crossing.

The Project Team also worked with residents throughout the area of the transmission corridor that traverses a densely populated residential neighborhood. In working with individual residents, the design was altered from its original side-by-side design to a double circuit design based on their feedback.

Lastly, the town was very interested in moving the transition structure from the edge of the western shore of Little Bay inland as the structure's proposed location was visible from the water. The Project has contracted to obtain new property rights to allow the Project to be placed underground until it transitions above ground approximately 360 feet from the shore of Little Bay.

Newington

After the Public Information Sessions, the Project team continued working with Newington town officials to address public feedback concerns presented from the town.

The Project originally proposed underground construction from Little Bay, through the road in Gundalow Landing where it would transition above ground at the east edge of Little Bay Road. The Project team worked with the resident abutting Little Bay to relocate the easement and minimize the property impact of underground construction. The initial line design followed the road as it left the property abutting Little Bay. The Town informed PSNH that it preferred the line to be placed on the edge of the abutting properties to minimize impacts to Gundalow Landing Circle during construction. The Project team continues to work with property owners to secure additional rights to relocate the underground segment to private property adjacent to the road, as requested by the town. However, PSNH cannot incorporate this design as part of its Application since all of the necessary rights have not been granted as of the date of this filing.

The Town also requested the relocation of the transition structure from the east edge of Little Bay Road. Town officials requested that the Project

acquire an easement on the adjacent town property to help buffer the view of the transition structure. The Project Team engineered a solution to address this concern and submitted a request for an easement to the Town along with a survey and real estate documentation. However, the Town approvals needed to proceed with the easement have not been granted, and therefore, the requested revision could not be incorporated into the proposed design as of the date of this filing.

The original line design also proposed an overhead design in and near the Newington Center Historic District. To address concerns with the initial design raised by the Town of Newington, PSNH has altered the proposed structure types and will remove the existing distribution line that traverses the Newington Center Historic District in order to reduce the height of the new structures. After further review of the location and discussions with Newington officials, the Project Team also proposed an underground solution in these areas. The Project team met with Newington landowners and residents to discuss the proposed underground design. However, PSNH cannot incorporate this design as part of its Application since the necessary rights have not been granted as of the date of this filing.

Portsmouth

The Project Team has met with Portsmouth City Officials to keep them informed of the project status. The proposed line design through Portsmouth is limited to property owned by PSNH and within an existing corridor occupied by several others lines and as a result neither the city nor the residents have requested revisions to the design.

d. Post Filing Sessions

Within 45 days after the Application has been reviewed and accepted by the SEC, the Applicant will host two additional public information sessions, one in Strafford County and one in Rockingham County. Each public information session will be preceded by a second open house to inform the public about the Project and seek comments from the public.

(b) The economy of the region, including an assessment of:

(1) The economic effect of the facility on the affected communities;

Eversource commissioned an analysis on the economic impacts of the proposed Project both in the State and locally. The analysis was prepared by Dr. Lisa Shapiro who reviewed the economic effects of the proposed Seacoast Reliability Project on host communities, counties, and the State. The widely used Regional Economic Models, Inc. ("REMI") econometric model was used to estimate economic impacts of the Project. The Project will provide significant benefits to the affected communities as discussed below.

The Project benefits to the State and local host communities are clear. The positive economic impacts will be most significant during the construction phase. However, additional benefits, including increases to the tax base, will continue throughout the life of the Project.

(2) The economic effect of the proposed facility on in-state economic activity during construction and operation periods;

Economic benefits to the local communities in the project area will peak during construction. The Project will invest approximately $77 million in local and State infrastructure and improvements, with an estimated approximate $17.4 million spent with New Hampshire businesses and labor. The proposed infrastructure investments are located in the towns of Madbury, Durham, Newington, and the city of Portsmouth. The proposed Project will increase economic activity locally and statewide by creating jobs and increasing economic output (sales), gross state product ("GSP"), and personal income during the planning and construction phase between 2015 to 2018.

(3) The effect of the proposed facility on State and tax revenues and the tax revenues of the host and regional communities;

In addition, the Project will provide an increase to the tax base. Within the first year of operation, the Project will pay between $1.5 and $2.1 million in total property taxes. This includes $956,000 to $1.4 million to the four host communities, $157,000 to $173,000 to Strafford and Rockingham Counties, and $460,000 to $562,000 to the State for redistribution to local school districts. Actual taxes paid by Eversource will depend on the total cost and market value of the Project property in each community, government spending, other sources of revenue, and the tax base, after construction. Additionally, during the construction phase, the State's economic output will be approximately $28 million higher, and GSP an estimated $18 million to $19 million higher than they would be in the absence of constructing the proposed Project. See State and Local Tax Revenue Data, Appendix 44.

(4) The effect of the proposed facility on real estate values in the affected communities;

The Applicant has prepared an extensive analysis of the possible effects of the Project on real estate markets in the region. The Applicant retained experts to assess the state of knowledge with respect to property value effects of high voltage transmission lines ("HVTL") on property values and to supplement existing research with New Hampshire-specific research initiatives. The findings are set forth in a report titled *High Voltage Transmission Lines and New Hampshire Real Estate Markets: A Research Report* (the "Research Report"), Appendix 45. The analysis of the Research Report's conclusions and their application to the Project are set forth in the Pre-Filed Testimony of James Chalmers.

The extensive published literature compares sales of properties potentially affected by HVTL with sales of unaffected properties. A brief summary is as follows.

For residential properties about half of the studies find some measure of negative proximity effects, while the other half find none. Where effects are found, they tend to be small, (usually in the 1-6% range), tend to decrease rapidly with distance from the HVTL, and to dissipate over time. Once proximity has been accounted for, visibility generally has no additional, independent effect in the statistical studies. Encumbrance frequently has no effect on market value.[41] Where there is an effect, it is small relative to the size of the encumbrance.

For commercial and industrial properties, there are generally no effects from proximity to HVTL unless site development is constrained in a way that reduces the income producing potential of the property, such as by reducing the size of the improvements that can be built on the site.

Vacant land is generally not impacted unless development is constrained by the ROW, or unless the HVTL are the principal differentiating feature of otherwise similar parcels.

The results in the published literature are sufficiently consistent across geographies and development patterns to predict similar conclusions regarding New Hampshire. Nevertheless, as described in the Research Report, three New Hampshire-specific research initiatives were undertaken for further study of this issue: Case Studies; Subdivision Studies; and Market Activity Research.

The Case Studies represent a broad spectrum of recently sold properties crossed by, or adjacent to, HVTL in New Hampshire. There is variety in property location, size and value and in the way in which the property is physically affected by the HVTL. While the results of any single case study are necessarily anecdotal, useful generalizations can be drawn when considering the results from all 58 Case Studies. These include the following. Sale price effects are infrequent—10 cases out of 58 (17%) found a sale price effect with another 11 cases (19%) suggesting a possible sale price effect. Thirty-seven cases or 64% concluded no sale price effect. Where sale price effects were found, they appear to have been small and to have decreased rapidly with distance. Only one of the 10 cases in which a sale price effect was found concerned a house located more than 100 feet from the edge of the ROW while seven of the 10 were located within 30 feet. With only one exception, for a sale price effect to occur, close proximity was combined with clear visibility of the HVTL. In 41 of the 58 cases, there was no marketing time effect of the HVTL.

In the Subdivision Studies, lot sales were studied at 13 subdivisions where some lots were crossed or bordered by a HVTL ROW and others were not. The market response to each category was analyzed for impact on sale price and marketing time. The lot sale histories indicated a general lack of marketability issues associated with lots encumbered by, or abutting, a HVTL ROW and 8 of the 13 subdivisions studied showed no sale price or marketing time effect associated with the HVTL. In those

[41] A property crossed by an easement is referred to as "encumbered" by the easement.

cases where there were price effects, the lots were heavily encumbered and frequently the area in which improvements could be sited was constrained.

In the Market Activity Research, data were initially collected for all sales occurring in towns for which some portion of the town falls within one mile of a HVTL. The sales were categorized by distance into three groups—encumbered or abutting, one foot to 500 feet and 500 feet to one mile. Multiple Listing Service data on sale price to list price ratios and days on market were then analyzed to see if there was market resistance to the properties in locational zones closest to the HVTL. The analysis indicated no systematic market disadvantage of the encumbered or proximate properties relative to the more distant group with respect to the two measures.

In summary, the findings of the three New Hampshire-specific research initiatives are consistent with the conclusions of the published literature, namely: there is no evidence that HVTL result in systematic or widespread effects on real estate markets; and, where there are effects, the effects are small and decrease rapidly with distance.

The research is clear that when adverse effects occur, proximity of residential property to the ROW combined with clear visibility of the HVTL are the critical variables. The Project and the new HVTL will be in an existing ROW; therefore, proximity of homes with respect to the ROW will not change. Based on the Case Studies research, those properties that could potentially be affected are very close to the ROW and do not have clear visibility of existing lines in the corridor, but will have clear visibility of existing, new or relocated lines after the Project is constructed. The number of these properties is small.

For the Project, the new HVTL will be in an existing ROW so proximity of homes with respect to the ROW will not change. Based on the Case Studies research, those properties that could potentially be affected are homes very close to the ROW that do not have clear visibility of the existing distribution lines but will have clear visibility of the Project. The number of such properties is very small. Based on a proximity criterion of 100 feet, there are 19 properties potentially affected. But several of these already have clear visibility of the existing lines in the ROW and others do not but will continue to be screened from the new lines. Of the remaining small number of properties, the research suggests some may experience small market value effects and some will not.

Based on the published research, the three New Hampshire-specific research initiatives and the particular characteristics of the Project, Chalmers concludes that the Project will not have a discernible effect on local or regional real estate markets.

(5) The effect of the proposed facility on tourism and recreation; and

Potential impacts to tourism were carefully considered as part of this review. This analysis included an examination of tourist-oriented attractions and recreation facilities in the Seacoast Region, as well as along the Project corridor. This assessment revealed that the Project will not impact tourism or recreation in the area.

There are no state parks and no public or private campgrounds within or adjacent to the Project area. There also are no formal snowmobile trails or off highway recreation vehicle ("OHRV") trails that intersect the corridor.

There are several trails, such as the Sweet Trail and the trails in East and West Foss Farm, as well as trails within conservation parcels such as Old Reservoir, College Woods, Kitfield Tract, and Longmarsh Road, located within the town of Durham. The Project will not impact the continued use of these trails.

The Project intersects Route 108, a portion of which is designated by the state as the Mills Scenic Byway. There are some crossings of town-designated scenic roads, including: Durham Point Road in Durham; and Gundalow Landing, Little Bay Road, Old Post Road, Nimble Hill Road, Fox Point Road, and Gosling Road in Newington. All of these crossings occur within an existing right-of-way.

Almost all communities in New Hampshire have historical resources, some of which attract visitors. These resources are described in the PAF, Appendix 10, and in the Pre-Filed Testimony of Cherilyn Widell.

Nearby shopping areas include the Fox Run Mall and the Crossings at the Fox Run Mall in Newington, downtown Portsmouth, and the Kittery Outlet Malls in Maine. The Crossings at the Fox Run Mall is located within and adjacent to the corridor, and includes other existing overhead electric lines within its paved parking area. The Project will not affect the number of shoppers or patrons at the mall or retail businesses.

The University of New Hampshire has a number of facilities which draw visitors to Durham, however, the Project will not impact tourist activities. The corridor follows the railroad tracks through UNH property near the Whittemore Center, Memorial Field, the Dairy Bar/Amtrak Station and the UNH Field House. The Project will not affect the number of people who attend or participate in sporting events and other uses such as commencement, concerts, and trade shows. The Project also will not affect Amtrak ridership, or the number of people who use the adjacent parking lots.

(6) The effect of the proposed facility on community services and infrastructure;

The construction and operation of the Project will improve electrical reliability and will not place any new or significant demands on local or regional services, facilities, or infrastructure. Once the Project is constructed, the operation of the Project will not place any new or increased demands on school facilities, police or fire stations, roads, transit services, solid waste disposal, drinking water or wastewater treatment facilities or services, recreation facilities, medical facilities or services, or any other community service or infrastructure. Please also see Pre-Filed Testimony of Dr. Lisa Shapiro, Robert Varney and Robert Andrew.

(c) Employment in the region, including an assessment of:

(1) The number and types of full-time equivalent local jobs expected to be created, preserved, or otherwise affected by the construction of the proposed facility, including direct construction employment and indirect employment induced by facility-related wages and expenditures; and

During the construction phase of the Project, there will be the greatest economic activity and benefits for Rockingham and Strafford County and the surrounding area. During the peak year of construction, the peak number of total jobs is estimated to be between 69 and 123, depending on the assumptions and modeling specifics. The annual average total number of New Hampshire jobs during the Project construction period is between 35 and 55. The anticipated employment opportunities created by the Project include jobs directly filled by local labor and consist of construction employment and indirect and induced employment from project wages and local project expenditures.

Other local economic benefits include direct expenditures on labor, materials, and services during construction and operations. The estimated employment impacts and economic activity associated with construction of the proposed Project will in turn lead to greater personal income for New Hampshire workers. As a result, personal income in New Hampshire is estimated to increase by a total of $9 million to $13 million on a cumulative basis over the construction period. Annually, the increase will average between $2.2 million and $3.3 million.

(2) The number and types of full-time equivalent jobs expected to be created, preserved, or otherwise affected by the operation of the proposed facility, including direct employment by the applicant and indirect employment induced by facility-related wages and expenditures.

PSNH expects that there may be some additional incremental work needed for the operation and maintenance of the Project due to the additional infrastructure. However, based on the minimal amount of incremental work, PSNH expects that there would only be nominal impacts to direct, indirect, and induced jobs.

(d) Summary

All of the foregoing information, together with the additional information and the Pre-Filed Testimony of Robert Varney, James Chalmers, and Dr. Lisa Shapiro, demonstrates that the Project is consistent with the orderly development of the region.