Joint Application for a Certificate of Site and Facility

Revised December 23, 2015

■

NEW HAMPSHIRE SITE EVALUATION COMMITTEE

Docket No. 2015–05

JOINT APPLICATION OF NEW ENGLAND POWER COMPANY d/b/a NATIONAL GRID & PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE d/b/a EVERSOURCE ENERGY

FOR A CERTIFICATE OF SITE AND FACILITY

FOR CONSTRUCTION OF A NEW 345 kV ELECTRIC TRANSMISSION LINE IN SOUTHERN NEW HAMPSHIRE

SUPPLEMENT NUMBER 2

DECEMBER 23, 2015

Barry Needleman, Esq.
McLane, Graf, Raulerson & Middleton, PA
11 South Main Street, Suite 500
Concord, NH 03301
(t) (603) 226-0400 · (f) (603) 230-4448
barry.needleman@mclane.com

Christopher J. Allwarden, Esq.
Public Service Company of New Hampshire d/b/a Eversource Energy
Energy Park
780 North Commercial Street
Manchester, NH 03101
(t) (603) 634-2459 · (f) (603) 634-2438
christopher.allwarden@eversource.com

Mark R. Rielly, Esq.
New England Power Company d/b/a National Grid
40 Sylvan Road
Waltham, MA 02451
(t) (781) 907-2111 · (f) (781) 296-8091
mark.rielly@nationalgrid.com

TABLE OF CONTENTS

LIST OF APPENDICES - REVISED

Volume I

Volume II

Volume III

Volume III -	**Continued**
Appendix W.	National Grid Corporate Organization Chart
Appendix X.	National Grid Service Territory Map
Appendix Y.	Eversource Corporate Organization Chart
Appendix Z.	Eversource Service Territory Map
Appendix AA.	Written Notification to Governing Bodies of Each Community
Appendix AB.	Visual Impact Assessment, Merrimack Valley Reliability Project, Towns of Pelham, Windham, Hudson and Londonderry, NH, May 2015 - **REVISED**
Volume IV	
Appendix AC.	NHDHR to NH Division of Corps of Engineers, June 2, 2015
Appendix AD.	NH Impaired Waters Maps
Appendix AE.	Regulatory Agency Consultation Summary Table
Appendix AF.	Current Status of Research on Extremely Low Frequency Electric and Magnetic Field and Health, Merrimack Valley Reliability Project, April 27, 2015
Appendix AG.	Eversource/National Grid Merrimack Valley Reliability Project Electric Field, Magnetic Field, Audible Noise, and Radio Noise Modeling in New Hampshire, June 16, 2015 - **REVISED**
Appendix AH.	Traffic Management for Public Highways and Local Streets, Merrimack Valley Reliability Project, June 17, 2015
Appendix AI.	Review of Land Use and Local and Regional Planning, The Merrimack Valley Reliability Project, June 29, 2015
Appendix AJ.	Economic Impact of the Merrimack Valley Reliability Project, REMI Analysis of Construction Spending and Property Taxes, June, 2015
Appendix AK.	High Voltage Transmission Lines and Real Estate Markets in New Hampshire: A Research Report, June 30, 2015
Appendix AL.	Pre-Filing Public Information Session Transcripts: Londonderry, NH (Rockingham County), May 6, 2015; Hudson, NH (Hillsborough County), May 7, 2015
Appendix AM.	CONFIDENTIAL - Summary Report, NEP 345 kV 3124 Merrimack Valley Reliability Project, Pelham, Windham, Hudson and Londonderry, New Hampshire, Phase IA Sensitivity Assessment and Walkover Survey, June 26, 2015 and Refined Archaeological Sensitivity Maps, May 2015
Appendix AN.	**Technical Report Phase I-B Archeological Survey, Pelham, Windham, Hudson, NH, Oct 2015; DHR Project Review, 12/9/15**

LIST OF TABLES

be upgraded to 19#6 alumoweld depending upon the loading analysis and any site specific constraints. Please refer to Table 7 below for details pertaining to all wire types to be utilized on Segments 3 and 4.

Table 7. New 3124 Line Conductor and Shield Wire Table

Position	Cable Type	Code Name	Diameter (in)	Weight (lbs/ft)	RBS* (lbs)
Conductor	1590 ACSR (54/19)	Falcon	1.545	2.042	54,500
Shield Wire	Brugg-48F/36SM/12TW	-	0.650	0.407	17,618
Shield Wire	19#10 Alumoweld	-	0.509	0.449	27,190

* Rated Breaking Strength

Segment 3 (PSNH): NEP/PSNH Demarcation Point to Structure 236

Segment 3 consists of the approximately 3.9 miles of PSNH ROW from the ownership line of demarcation with NEP in Hudson, NH to where the new 3124 Line departs the generally north-south corridor running parallel to NEP's ROW and turns northeasterly towards the Scobie Pond 345 kV Substation in Londonderry, NH (Segment 4).

Segment 3 extends from Mile 14.6 to Mile 18.5 of MVRP. Currently this section of ROW contains the 345 kV 326 Line, which is located 31.5 feet from the western edge of a 216.5-foot wide ROW. The 3124 Line will be installed approximately 100 feet to the east of the existing 326 Line and approximately 85 feet from the western edge of the existing ROW. The proposed configuration following the installation of the new 3124 Line will now contain two circuits respectively from west to east; the 345 kV 326 Line and the 345 kV 3124 Line. In this section, the centerline of the proposed 3124 Line is not occupied by a transmission facility. Approximately 90 feet of vegetation clearing within the unoccupied eastern edge of ROW will be required to construct the new 3124 Line in its proposed location.

Currently, 37 structures are proposed in Segment 3. In this Segment there are three general structure types proposed: H-Frame suspension structures, guyed three pole suspension pull-off structures, and guyed three pole dead-end structures.[50]

There is one cross-section associated with Segment 3.[51] The new 3124 Line remains parallel to the existing 326 Line for the entire length of this Segment along the long-preserved 345 kV centerline.

Segment 4 (PSNH): Structure 237 to Scobie Pond 345 kV Substation

Segment 4 of the Project begins from the point that the PSNH ROW diverges from running parallel with the NEP ROW and continues east to the Scobie Pond 345 kV Substation for approximately 5.9 miles. In this Segment, the new 3124 Line will be installed in the center

50 Engineering Drawings, Appendix R, Eversource Drawings S3124-P003 SH-1 through SH-5.
51 Engineering Drawings, Appendix R, Eversource Drawing S3124-P005, Section I.

of the existing ROW in an area that has not been previously cleared. As noted previously, the ROW contains several existing overhead transmission lines (345 kV 380 line, 345 kV 326 line, 115 kV Z119 line, 115 kV X116 Line) and, in some locations, additional overhead distribution circuits. No reconfiguration of the existing transmission or distribution lines is required in this Segment. Approximately 50 feet of vegetation will need to be cleared from the center of the PSNH ROW to enable construction of the new line.

Currently, 52 structures are proposed in Segment 3 and five general structure types are proposed: H-Frame suspension and deadend structures, guyed three pole suspension pull-off structures, guyed three pole dead-end structures, a two-pole deadend structure, and a monopole deadend transposition structure.[52]

There are a total of eleven cross-sections associated with Segment 4[53]. These cross-sections predominately vary with respect to the lines which enter and leave the ROW along the eastern edge. The new 3124 Line remains parallel to the existing 326 line for the entire length of this Segment along the long-preserved 345 kV centerline.

Mile 18.5 to Mile 20.4 and Mile 20.4 to Mile 20.5 are characterized by two cross-sections[54] and are 460 feet in width. These sections of ROW contain four existing transmission lines respectively from west to east; the 345 kV 380 line, the 345 kV 326 line, the 115 kV Z119 line, and the 115 kV X116 line. The proposed configuration following the installation of the new 345 kV 3124 Line will contain five transmission lines respectively from west to east; the 345 kV 380 line, the 345 kV 326 line, the 345 kV 3124 Line, the 115 kV Z119 line, and the 115 kV X116 line. In these cross-sections, the new 3124 Line would be located along a centerline alignment that does not contain any existing facilities. The new 3124 Line would be located approximately 100 feet to the east of the existing 326 line and approximately 87.5 feet to the west of the existing Z119 line. The removal of approximately 50 feet of vegetation located in the approximate center of the ROW will be required to construct the new 3124 Line in its proposed location.

The ROW width is approximately 635 feet for the cross-sections[55] associated with Mile 20.5 to Mile 20.6 and Mile 20.6 to Mile 21.6. These sections of ROW presently contain five transmission lines respectively from west to east; the 345 kV 380 line, the 345 kV 326 line, the 115 kV S188 line, the 115 kV X116 line and the 115 kV Z119 line. The proposed configuration following the installation of the new 3124 Line will contain six transmission lines respectively from west to east; the 345 kV 380 line, the 345 kV 326 line, the 345 kV 3124 Line, the 115 kV S188 line, the 115 kV X116 line, and the 115 kV Z119 line. The new 3124 Line would be located 100 feet to the east of the existing 326 line and approximately 70 feet to the west of the S188 line. The removal of approximately 50 feet

52 Engineering Drawings, Appendix R, Eversource Drawings S3124-P003 SH01 through SH06, SH7a.
53 Engineering Drawings, Appendix R, Eversource Drawing S3124-P005, Secction II-XII.
54 Engineering Drawings, Appendix R, Eversource Drawing S3124-P005, Sections II, III.
55 Engineering Drawings, Appendix R, Eversource Drawing S3124-P005, Section IV and V.

of vegetation located in the approximate center of the ROW will be required to construct the new 3124 Line in its proposed location.

The ROW width between Mile 21.6 to Mile 21.7[56] is approximately 635 feet. This section of the ROW presently contains five transmission lines and three distribution lines respectively from west to east; the 34.5 kV 3184 line, the 345 kV 380 line, the 345 kV 326 line, the 115 kV R187 line, the 115 kV X116 line, the 115 kV Z119 line, the 34.5 kV 365 line, and the 3128X distribution line. The proposed configuration following the installation of the new 3124 Line will contain six transmission lines and three distribution lines respectively from west to east; the 34.5 kV 3184 line, the 345 kV 380 line, the 345 kV 326 line, the 345 kV 3124 Line, the 115 kV R187 line, the 115 kV X116 line, the 115 kV Z119 line, the 34.5 kV 365 line, and the 3128X distribution line. The new 3124 Line would be located approximately 100 feet to the east of the 326 line and generally 70 feet to the west of the R178 line. The removal of approximately 50 feet of vegetation located in the approximate center of the ROW will be required to construct the new 3124 Line in its proposed location.

All three cross-sections[57] between Mile 21.7 and Mile 23.0 are approximately 535 feet in width. These sections of the ROW presently contain five transmission lines and a distribution line respectively from west to east; the 345 kV 380 line, the 345 kV 326 line, the 115 kV R187 line, the 115 kV X116 line, the 115 kV Z119 line, and the 34.5 kV 365 line. The proposed configuration following the installation of the new 3124 Line will contain six transmission lines and a distribution line respectively from west to east; the 345 kV 380 line, the 345 kV 326 line, the 345 kV 3124 line, the 115 kV R187 line, the 115 kV X116 line, the 115 kV Z119 line, and the 34.5 kV 365 line. The new 3124 Line would be located approximately 100 feet to the east of the 326 line and approximately 70 feet to the west of the R187 line. The removal of approximately 50 feet of vegetation located in the approximate center of the ROW will be required to construct the new 3124 Line in its proposed location.

Mile 23.0 to Mile 23.8[58] is approximately 535 feet in width. This section of the ROW presently contains five transmission lines, respectively from west to east; the 345 kV 380 line, the 345 kV 326 line, the 115 kV R187 line, the 115 kV X116 line, and the 115 kV Z119 line. The proposed configuration following the installation of the new 3124 Line will contain six transmission lines respectively from west to east; the 345 kV 380 line, the 345 kV 326 line, the 345 kV 3124 Line, the 115 kV R187 line, the 115 kV X116 line, and the 115 kV Z119 line. The new 3124 Line would be located approximately 100 feet to the east of the 326 line and approximately 70 feet to the west of the R187 line. The removal of approximately 50 feet of vegetation located in the approximate center of the ROW will be required to construct the new 3124 Line in its proposed location.

56 Engineering Drawings, Appendix R, Eversource Drawing S3124-P005, Section VI.
57 Engineering Drawings, Appendix R, Eversource Drawing S3124-P005, Section VII, VIII, IX.
58 Engineering Drawings, Appendix R, Eversource Drawing S3124-P005, Section X.

Mile 23.8 to Mile 24.1[59] is approximately 535 feet in width. This section of the ROW presently contains five transmission lines and two distribution circuits supported by a double circuit structure respectively from west to east; the 345 kV 380 line, the 345 kV 326 line, the 115 kV R187 line, the 115 kV X116 line, the 115 kV Z119 line, and the double circuit 32W4 and 32W3 distribution lines. The proposed configuration following the installation of the new 3124 Line will contain six transmission lines and two distribution circuits supported by a double circuit structure respectively from west to east; the 345 kV 380 line, the 345 kV 326 line, the 345 kV 3124 Line, the 115 kV R187 line, the 115 kV X116 line, the 115 kV Z119 line, and the double circuit 32W4 and 32W3 distribution lines. The new 3124 Line would be located approximately 100 feet to the east of the 326 line and approximately 70 feet to the west of the R187 line. The removal of approximately 50 feet of vegetation located in the approximate center of the ROW will be required to construct the new 3124 Line in its proposed location.

The final cross-section[60] extends from Mile 24.1 to the Scobie Pond 345 kV Substation on PSNH fee-owned property. This section of the ROW presently contains two transmission lines respectively from west to east; the 345 kV 380 line and the 345 kV 326 line. The proposed configuration following the installation of the new 3124 Line will contain three transmission lines respectively from west to east; the 345 kV 380 line, the 345 kV 326 line and the 345 kV 3124 Line. The new 3124 Line would be located to the east of the 326 line. The removal of vegetation located on the eastern edge of the 326 line will be required to construct the new 3124 Line in its proposed location.

Scobie Pond 345 kV Substation

A new 345 kV transmission line terminal will be constructed at the Scobie Pond 345 kV Substation. The new terminal will be similar in design to the existing 345 kV terminations at the Substation The new terminal addition consists of one line terminal structure, two circuit breakers, five manual and one motor operated disconnect switches, three surge arrestors, and three coupling CCVTs. The substation yard lighting will be extended to the new terminal bay. No yard expansion or fence modifications will be required for the terminal addition.

1) Identification of the Applicants' preferred location and any alternative locations it considers available for the site of each major part of the proposed facility

Preferred Location

The location of the Project is described in Sections (c)(1) and (h)(1) above. The preferred route for the Project was selected among all other alternatives considered because it:

59 Engineering Drawings, Appendix R, Eversource Drawing S3124-P005, Section XI.
60 Engineering Drawings, Appendix R, Eversource Drawing S3124-P005, Section XII.

contribute to fisheries habitat and recreational opportunities such as canoeing and kayaking.

The majority of the remaining Project ROW wetlands are currently maintained as either scrub-shrub or emergent habitat. Scrub-shrub/emergent wetlands associated with streams provide flood alteration, sediment and shoreline stabilization, wildlife habitat and production export functions as wildlife food sources. However, when not associated with a stream, hydrologically isolated and small in size, these wetlands tend to exhibit limited functions and values.

Wetland and surface water impacts were assessed using Environmental Systems Research Institute (ESRI) ArcGIS© desktop software. Temporary and permanent impacts are totaled by wetland and stream type, presented in the Wetlands Permit Application Form for each municipality, are included in Appendix F. Secondary impacts, the conversion of forested wetlands to scrub-shrub and emergent wetlands, were assessed using ESRI ArcGIS© desktop software. Secondary, vernal pool, and vernal pool buffer impacts are totaled and also presented in the Wetlands Permit Application narrative in Appendix F. Secondary wetland impacts, riparian buffer, and vernal pool buffer impacts are considered jurisdictional impacts under the New Hampshire Programmatic General Permit (PGP) and are included in the Wetlands Permit Application to calculate the required mitigation under the PGP. Below is a summary of proposed wetland impacts.

Table 8. Summary of NHDES Jurisdictional Wetland Impacts

Type of Impact	Description	Impact Calculation
Permanent wetland impact	Structures and permanent crossings	4,428 sq. ft. (.10 acre)
Temporary wetland impact	Construction impacts in wetlands	385,396 sq. ft. (8.86 acre)
Temporary stream impact	Construction impacts in streams	6,365 sq. ft. (.15 acre)
Permanent stream impact	Stream realignment (SA-41)	80 sq. ft. (17 linear feet)

In order to accommodate the installation of proposed 3-pole Structure 253 along the 3124 Line in Londonderry, the Project will involve realignment of the western portion of a single intermittent stream channel, identified as SA-41 on Sheet 87 of the Wetland Permitting Plans (Attachment A of Appendix F). The proposed channel realignment ("the Site") is located within the PSNH ROW approximately 1,200 feet east of High Range Road. Channel realignment is necessary at this location, as it has been determined by project engineers that the stream could interfere with the central support footing and/or the designated guy anchors of proposed Structure 253, thus compromising its long-term stability. The proposed location of Structure 253 cannot be moved, as its location represents a critical turning point in the ROW where the 3124 Line changes direction to the south. Proposed realignment of the western portion of SA-41 will result in approximately 80 sq. ft. and 17 linear feet of permanent stream bed impact.

The watershed to the Site is approximately 19.2-acres with a majority of the drainage area (17.1-acres) located to the east of High Range Road flowing overland into a roadside

quality resulting from land disturbance. Temporary and permanent stabilization will occur in accordance with Project plans.

Wetland Impact Mitigation

The Project has avoided and minimized permanent and temporary wetland impacts to the greatest extent feasible through Project design and construction methodology. Permanent wetland impacts are below the NHDES threshold for mitigation (10,000 sq. ft. of permanent wetland impact). However, in accordance with applicable federal regulations and guidance, mitigation is proposed for direct and secondary Project impacts to wetlands and impacts to riparian and vernal pool 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 USEPA, USACE, and NHDES. A summary of Project impacts and mitigation burden are displayed in Table 9 below.

The Project proposes mitigation in the form of in-kind mitigation (i.e., upland buffer preservation) and/or an In-Lieu Fee contribution to the Aquatic Resource Mitigation (ARM) fund. Requests for potential in-kind mitigation projects have been made to each of the impacted towns as well as to regional land trusts and area conservation groups. To date, Pelham and Londonderry have requested upland buffer mitigation projects that are being evaluated by the Applicants. Windham has responded that they were unable to identify a suitable in-kind mitigation projects. Hudson did not respond to the request for potential in-kind mitigation projects.

Applicants will continue to develop a mitigation package that will be acceptable to NHDES, USEPA, and USACE. A Preliminary Mitigation Agreement has been included in the Wetlands Permit Application in Appendix F.

Table 9. Summary of USACE Jurisdictional Impacts and Mitigation Burden (in acres)

Town	Permanent Wetland/ Stream Impacts	Temporary Wetland/ Stream Impacts	Secondary Wetland Impacts	Vernal Pool Secondary Impacts	Vernal Pool Buffer Secondary Impacts	Riparian Buffer Secondary Impacts	Total Impacts	Mitigated Impacts
Pelham	0.086	3.674	0.416	0.007	0.084	0.143	4.409	0.369
Windham	0.006	0.161	0.042	0.000	0.023	0.183	0.415	0.051
Hudson	0.003	0.667	2.445	0.350	0.786	2.130	6.381	0.951
Londonderry	0.007	4.356	7.243	0.374	2.254	2.066	16.300	2.074
Total	0.102	8.859	10.145	0.730	3.147	4.522	27.505	3.445