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March 2, 2018

Stephen H. August, Esq.
Energy Facilities Siting Board
One South Station
Boston, MA 02110

Re: NSTAR Electric Company d/b/a Eversource Energy, EFSB 17-02/ D.P.U. 17-82/17-83

Dear Mr. August:

On behalf of NSTAR Electric Company d/b/a Eversource Energy (the "Company"), enclosed please find an original and five copies of the Company's Initial Brief in the above-referenced proceeding. A Certificate of Service is enclosed.

Thank you for your attention to this matter.

Very truly yours,

Catherine Keuthen

Enclosures

**COMMONWEALTH OF MASSACHUSETTS**
**ENERGY FACILITIES SITING BOARD**

| | | |
|---|---|---|
| NSTAR Electric Company<br>d/b/a Eversource Energy | ) | EFSB 17-02/ D.P.U. 17-82/17-83 |

CERTIFICATE OF SERVICE

I hereby certify that, pursuant to 980 C.M.R. 1.03(4), I have on or before this day served a true copy of the enclosed documents, electronically, upon all parties of record in this proceeding.

Dated at Boston, Massachusetts this 2nd day of March, 2018.

Catherine J. Keuthen
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**COMMONWEALTH OF MASSACHUSETTS**
**ENERGY FACILITIES SITING BOARD**
**DEPARTMENT OF PUBLIC UTILITIES**

| | |
|---|---|
| Petition of NSTAR Electric Company d/b/a Eversource Energy Pursuant to G.L. c. 164, §§ 69J and 72 for Approval to Construct, Operate and Maintain a New 115-kV Transmission Line in the Towns of Sudbury, Hudson and Stow and the City of Marlborough and to Make Modifications to an Existing Substation in Sudbury and for Exemptions from the Operation of the Zoning Bylaws in Sudbury, Hudson and Stow Pursuant to G.L. c. 40A, § 3 | EFSB 17-02/D.P.U. 17-82/17-83 |

# INITIAL BRIEF OF NSTAR ELECTRIC COMPANY d/b/a EVERSOURCE ENERGY

Respectfully Submitted,

By its attorneys:

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Dated: March 2, 2018

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## I. INTRODUCTION

On April 20, 2017, pursuant to G.L. c. 164, § 69J ("Section 69J"), NSTAR Electric Company d/b/a Eversource Energy ("Eversource," or the "Company") filed with the Energy Facilities Siting Board (the "Siting Board") a petition to construct, operate and maintain an approximately 9-mile, 115-kilovolt ("kV") underground electric transmission line (the "New Line") between Eversource's Sudbury Substation located in Sudbury ("Sudbury Substation") and the Hudson Light & Power Department's ("HLPD") Substation in Hudson ("Hudson Substation") (the "Siting Board Petition"). The New Line will pass primarily through the Towns of Sudbury and Hudson and will cross short sections of the Town of Stow and the City of Marlborough. In Sudbury, Hudson, Stow and Marlborough, the New Line will be constructed underground along an inactive railroad corridor owned by the Massachusetts Bay Transportation Authority ("MBTA") (the "MBTA ROW"). In addition, portions of the New Line also will be constructed in public ways in Hudson. To accommodate the New Line, the Company and HLPD each will undertake modifications to their respective substations.[1] The New Line and related improvements to the Sudbury Substation comprise the Sudbury-Hudson Transmission Reliability Project (the "Project").

The Company also filed a petition on April 20, 2017 with the Department of Public Utilities (the "Department") requesting approval of the New Line in accordance with G.L. c. 164, § 72 ("Section 72 Petition"). Simultaneously therewith, the Company filed a second petition with the Department pursuant to G.L. c. 40A, § 3 for individual and comprehensive zoning exemptions

[1] HLPD was not a co-petitioner with Eversource in this proceeding. Exh. EV-2, at 1-1. Pursuant to an agreement between the Company and HLPD, the Eversource petition to the Siting Board was filed in conjunction with, and in support of, HLPD's plans to undertake the actual construction of three new 115-kV breakers at the Hudson Substation. Exh. EV-2, at 1-1. The Company will not construct, own, operate or maintain any transmission facilities at Hudson Substation. Exh. EV-2, at 1-1. The information provided regarding Hudson Substation is for informational purposes only. Exh. EV-2, at 1-1.

from the operation of: (1) the *Zoning Bylaw, Article IX, Town of Sudbury, Massachusetts* as amended through June 13, 2016 (the "Sudbury Zoning Bylaw") in connection with the Company's proposal to modify Sudbury Substation and to construct portions of the New Line in Sudbury along the MBTA ROW; (2) the *Town of Hudson Protective Zoning By-Law*s, as amended through February 28, 2017 (the "Hudson Zoning Bylaw"), in connection with the Company's proposal to construct portions of the New Line in Hudson along the MBTA ROW and public ways; and (3) the *Town of Stow, Massachusetts Zoning Bylaw*, as amended through May 2, 2016 (the "Stow Zoning Bylaw") in connection with the Company's proposal to construct portions of the New Line in Stow along the MBTA ROW ("Zoning Petition").[2]

The Section 72 Petition (docketed as D.P.U. 17-83) and the Zoning Petition (docketed as D.P.U. 17-82) were referred to the Siting Board by the Department and were consolidated with the Siting Board Petition (docketed as EFSB 17-02) for review. NSTAR Electric Company d/b/a Eversource Energy, EFSB 17-02/D.P.U. 17-82/17-83, Referral Order (April 27, 2017) and Consolidation Order (April 27, 2017). The Siting Board conducted a single adjudicatory proceeding and developed a single evidentiary record for the consolidated petitions. Pursuant to the post-hearing briefing schedule issued by the Presiding Officer, the Company submits this Initial Brief. NSTAR Electric Company d/b/a Eversource Energy, EFSB 17-02/D.P.U. 17-82/17-83, Post-Hearing Procedural Schedule (January 29, 2018).

The Company seeks authority to construct and operate the Project to fulfill its obligation to ensure the safe and reliable transmission of electric power to its customers and a reliable regional

[2] No zoning relief is necessary for the portion of the New Line that will be constructed in the City of Marlborough and, accordingly, no exemptions are required. The New Line will pass through land located in the Rural Residential Zoning District in Marlborough for a distance of approximately 0.01 miles (~53 feet). According to the Table of Use Regulations found in Section 650- 17 of the *Zoning Ordinance of the City of Marlborough, Massachusetts*, public utilities, not including storage yards or repair shops, are allowed as-of-right in the Rural Residential Zoning District. Exh. EV-3, at footnote 1; Exh. EFSB-Z-1.

transmission network. As described in more detail below, because the Project complies with all applicable standards of the Siting Board and the Department, the Company's Siting Board, Zoning and Section 72 Petitions should be approved.

## II. PROCEDURAL HISTORY

### A. Public Notice, Public Comment Period and Intervention

On April 20, 2017, as part of the Company's initial filing, copies of the Siting Board, Section 72 and Zoning Petitions were sent to the Town/City Clerks' Offices in Hudson, Marlborough, Sudbury and Stow.

On May 4, 2017, the Siting Board issued a Notice of Adjudication and Public Comment Hearing (the "Notice") that established the date of May 25, 2017 for a public comment hearing to be held at the Lincoln-Sudbury Regional High School Auditorium and the date of June 1, 2017 for a public comment hearing to be held at the Hudson High School Auditorium. The Notice established a deadline of June 15, 2016, for the filing of written comments regarding the Project and for the filing of petitions to intervene or for limited-participant status in the proceeding. As directed by the Siting Board, the Company published the Notice in both *The Boston Globe* and the *Metro Daily West* on May 11, 18 and 25, 2017.

On May 11, 2017, the Notice was provided to the clerks' offices and the Notice and the Petitions were provided to the public libraries in Hudson, Marlborough, Sudbury and Stow. The clerks and libraries were instructed to post the Notice for public viewing through June 15, 2017. NSTAR Electric Company d/b/a Eversource Energy, EFSB 17-02/D.P.U. 17-82/17-83, Affidavit of Kristin M. Reynolds. Also, on May 11, 2017, the Company sent the Notice by first class mail to approximately 1,400 owners of land abutting the Project and to the Boards of Selectmen, Planning Boards and Town Managers, as applicable, of Hudson, Sudbury, Marlborough and Stow,

and to the Planning Boards of each city and town abutting Hudson, Stow, Marlborough and Sudbury. NSTAR Electric Company d/b/a Eversource Energy, EFSB 17-02/D.P.U. 17-82/17-83, Affidavit of Kristin M. Reynolds.

Public comment hearings were conducted by the Siting Board on May 25, 2017 at the Lincoln-Sudbury Regional High School Auditorium and on June 1, 2017 at the Hudson High School Auditorium.

The Siting Board received five timely-filed petitions to intervene as full parties from: (1) Town of Sudbury; (2) Town of Hudson; (3) Town of Stow; (4) Protect Sudbury, Inc. ("Protect Sudbury"); and (5) Hudson Light & Power Department, as well as requests for limited-participant status on behalf of approximately 60 individuals. The Siting Board granted all petitions to intervene and for limited-participant status. NSTAR Electric Company d/b/a Eversource Energy, EFSB 17-02/D.P.U. 17-82/17-83, Ruling on Petitions to Intervene and for Limited Participant Status (June 26, 2017).

**B. Evidentiary Hearing and Evidentiary Record**

The Siting Board held 16 days of evidentiary hearings on the following dates: October 31, 2017; November 1, 6, 7, 9, and 15, 2017; December 5, 6, 8, 11, 13, 14, and 18, 2017; and January 9, 23 and 24, 2018. The Company presented a total of 17 witnesses for cross examination:

1. Beverly A. Schultz, Lead Project Manager for Eversource and Project Manager for the Project;

2. Robert D. Andrew, Director of System Solutions at Eversource, regarding the need for the Project and alternatives to the Project;

3. Elizabeth J. Leonard, P.E., Senior Planning Engineer in Eversource's System Planning Department, regarding the need for the Project and alternatives to the Project;

4. Robert P. Clarke, Director of Transmission Business Operations at Eversource, regarding the siting of the Project, community outreach, cost issues, and the project review process of ISO New England Inc. ("ISO-NE");

5. Brian J. Rice, Senior Regulatory Analyst, Regulatory Projects at Eversource, regarding the Company's experience with implementing and evaluating time-varying-rate programs and the Commonwealth of Massachusetts' solar policies;

6. Christopher P. Soderman, P.E., Lead Engineer in the Transmission Line Engineering Department at Eversource, regarding electric and magnetic field ("EMF") calculations and measurements;

7. John M. Zicko, P.E., Director of Massachusetts Substation Engineering at Eversource, regarding portions of the Project and alternatives that pertain to substations;

8. Demetrios Sakellaris, P.E., Transmission Engineering and Project Estimating, Lead Engineer at Eversource, regarding underground transmission line design;

9. Theresa M. Feuersanger, Supervisor of Transmission and Distribution Rights and Survey at Eversource, regarding real estate matters for the Project;

10. Denise M. Bartone, Senior Environmental Engineer at Eversource, regarding the environmental impacts of the Project;

11. Marc Bergeron, Senior Wetland Scientist, Project Manager, and the Director of Energy Services in Massachusetts for Vanasse Hangen Brustlin, Inc. ("VHB"), the Company's lead environmental consultant for the Project;

12. Paul McKinlay, Director of Remediation and Assessment at VHB, regarding potential hazardous material effects for the Project;

13. Meddie J. Perry, Senior Hydrogeologist at VHB, regarding groundwater impacts for the Project.

14. William H. Bailey, Ph.D., Principal Scientist at Exponent, regarding EMF and public health impacts;

15. Julia Frayer, Managing Director of London Economics International, LLC ("LEI"), regarding the analysis of non-transmission alternatives ("NTAs") for the Project;

16. Jawahar Shah, Senior Consultant at LEI regarding the NTA analysis; and

17. James A. Chalmers, Ph.D., Principal at Chalmers & Associates, LLC, regarding property value impacts of the Project.

On October 17, 2017, the Company submitted written rebuttal testimony from: (1) Ms. Leonard; (2) Ms. Frayer; (3) Mr. Bergeron; and (4) Mr. Rice. On November 7, 2017, the Company

submitted additional written rebuttal testimony from: (1) Mr. Bergeron; (2) Mr. Sakellaris and Ms. Bartone; (3) Mr. Zicko; and (4) Dr. Chalmers.

On October 10, 2017, the Town of Sudbury submitted direct testimony from:

1. Paul L. Chernick, President of Resource Insight, Inc., regarding the need for and alternatives to the Project;

2. Marta J. Nover and Ruth M. Geoffrey, Senior Wetland Scientist and Permitting Expert with Nover Armstrong Associates, Inc. ("Nover-Armstrong") and Director of Environmental Permitting and Planning with Nover-Armstrong, respectively, regarding the environmental impacts of the Project;[3]

3. Daniel F. Nason and William R. O'Rourke, P.E., Public Works Director and Deputy Public Works Director/Town Engineer, respectively, for the Town of Sudbury, regarding construction impacts and the Noticed Alternative Route;

4. Deborah M. Dineen, Conservation Coordinator for the Town of Sudbury, regarding the environmental impacts of the Project; and

5. Mark Herweck, Building Inspector and Zoning Enforcement Agent for the Town of Sudbury, regarding the Sudbury Zoning Bylaw.

These witnesses also appeared for cross-examination. On January 12, 2018, the Town of Sudbury submitted Supplemental Testimony of Paul L. Chernick.

On October 10, 2017, the Town of Hudson submitted direct testimony from: (1) Pam Helinek, Conservation Agent for the Town of Hudson, regarding the wetland, water and environmental resource impacts of the Project; and (2) Eric Ryder, Director of the Department of Public Works for the Town of Hudson, regarding the drinking water impacts of the Project. These witnesses appeared for cross-examination on December 13, 2017.

On October 31, 2017, Protect Sudbury submitted joint direct testimony from Richard Cote, Robert Hartzel, Matthew Lundsted, and Michael Ohl, Principals at Comprehensive Environmental

[3] On October 27, 2017, the Company filed the Draft Environmental Impact Report ("DEIR") for the Project. Exh. EV-16; Tr. 8, at 1,390. On December 1, 2017, pursuant to the Presiding Officer's ruling, the Town of Sudbury re-filed the joint testimony of Ms. Nover and Ms. Geoffrey, following review of the Company's DEIR.

Inc. ("CEI"), regarding the Company's cost estimates for the Project and project alternatives and regarding the Company's route selection process. These witnesses appeared for cross-examination on December 14, 2017.

On January 9, 2018, HLPD presented two witnesses for cross-examination: Michael Barrett, a principal with PLM, an electric power engineering firm and Brian Choquette, General Manager of HLPD.

Over 1,800 exhibits were entered into the evidentiary record, including the Company's petitions, responses to Information Requests and Record Requests, and hearing exhibits.

## III. PROJECT SUMMARY

The Project is one of approximately 40 transmission solutions that emerged from an extended study of the regional transmission system performed by ISO-NE and its Greater Boston Working Group (the "Working Group"), which included representatives from ISO-NE, New England Power Company and Eversource, that identified and addressed reliability needs for the New England transmission system serving northern Massachusetts and southern New Hampshire. Exh. EV-2, at ES-1. The Working Group's study process ultimately resulted in the issuance of the Greater Boston Area Updated Transmission Needs Assessment, dated January 2015 ("Updated Needs Assessment"). Exhs. EV-2, at 1-3, Appendix 2-1. Then, through an extensive stakeholder process, the Working Group identified and studied potential solutions to the various needs identified in the Updated Needs Assessment. Exh. EV-2, at 1-3. The Greater Boston Area Transmission Solutions Study, dated August 12, 2015 (the "Solutions Study"), details the development and comparison of alternative solutions and the identification of the preferred solution set of transmission projects, including the Project, as the preferred solution to the identified needs. Exhs. EV-2, at 1-3, Appendix 3-3.

The primary purpose of the Project is to resolve potential thermal overloads and low voltage conditions leading to voltage collapse that were identified during the ISO-NE assessment process as potentially resulting in the loss of electric service to approximately 80,000 customers in Berlin, Framingham, Grafton, Hudson, Marlborough, Northborough, Shrewsbury, Stow, Southborough and Westborough, totaling over 400 megawatts ("MW") of load. Exh. EV-2, at ES-1. In addition to satisfying the transmission need determined by ISO-NE, the Project will support the region's economic growth by introducing another geographically diverse source of transmission supply to the area and will produce new property tax revenue for the municipalities in which the new facilities are located. Id.

Eversource considered many geographically distinct routes for the New Line, including the use of both overhead and underground designs. Exh. EV-2, at ES-1. The Company conducted extensive community outreach, participating in numerous working meetings with the municipalities, government officials, residents and other stakeholders. Exh. EV-2, at ES-1. After carefully evaluating and considering the input received as part of its evaluation, the Company concluded that there were clear advantages of constructing the Project underground along the MBTA corridor. Exh. EV-2, at ES-1. The Company determined that the Project will best balance the goals of minimizing cost and environmental impacts while meeting the identified needs. Exh. EV-2, at ES-1.

**A. The Project**

The Project includes an underground transmission line design along a 9.01-mile route that begins at Sudbury Substation, located off Route 20, and travels in a northwesterly direction within the existing MBTA ROW for approximately 7.64 miles, traversing through the municipalities of

Sudbury (4.29 miles), Stow (0.07 miles), Marlborough (0.01 miles), and Hudson (3.27 miles).[4] Exh. EV-2, at 5-3. At the intersection of the MBTA ROW and Wilkins Street in Hudson, the Project route leaves the MBTA ROW and proceeds in a southwesterly direction along Wilkins Street (Route 62) and Forest Avenue for approximately 1.37 miles before terminating at the Hudson Substation. Exh. EV-2, at 5-3.

The Project along its proposed route on the inactive MBTA corridor affords Eversource the opportunity to partner with the Massachusetts Department of Conservation and Recreation ("DCR") to couple construction of the Project with the development of a portion of DCR's planned regional Mass Central Rail Trail ("MCRT"), a multi-use trail that will traverse the state from west to east and advance region-wide trail network connections. Exh. EV-2, at ES-2, 1-7. The shared-use path that would result from the Project would extend from downtown Sudbury, past New England farmland and forests, to the Assabet River Rail Trail in Hudson and Marlborough and the proposed continuation of the Bruce Freeman Rail Trail (Lowell to Sudbury). Exh. EV-2, at 1-7. The MCRT will bring several advantages to its users, surrounding communities, and the Commonwealth as a whole. Exh. EV-2, at ES-2. The new trail will extend public open space, promote regional connectivity and positive economic benefits, encourage exercise, and inspire environmental and historic appreciation by providing pedestrian and cycling rail trail users with access to the communities' many amenities, including recreational facilities, eateries, shops, and other businesses. Exh. EV-2, at 1-7. Additionally, construction of the New Line, in conjunction with the trail, provides a unique opportunity to achieve cost efficiencies and environmental

[4] The MBTA ROW is the former Massachusetts Central Railroad Corridor that was used for freight service from approximately 1887 to 1976. Exh. EV-2, at 5-42 to 5-43. The MBTA ROW has not been used for rail service for over forty years and currently contains remnants of the single-track railroad (ballast, tracks, and ties) in some portions. Exh. EV-2, at 5-43. Vegetation within the MBTA ROW has not been maintained since rail service was discontinued and consists mainly of shrubby growth and forested areas. Exh. EV-2, at 5-43.

benefits by repairing and repurposing bridges and landscape features. Exh. EV-2, at 1-7; Exh. RR-EFSB-18; Tr. 2, at 333-334. The Company will appropriately mitigate any impacts to the natural environmental arising from the construction. Impacts on residents and businesses alike will be greatly reduced by the joint endeavor. Exh. EV-2, at ES-2. The Company will provide annual operating lease payments to the MBTA for the use of the corridor. Exh. EV-2, at 1-7; Exh. RR-EFSB-37; Exh. RR-RFSB-38. The municipalities of Sudbury, Marlborough, Stow and Hudson will also receive substantial revenues from the taxes levied on the Company's investment in the Project. Exh. EV-2, at 1-7. Both the MBTA and the DCR support constructing the underground Project as proposed by the Company.[5] Exhs. EV-2, at ES-2; EFSB-G-1(3) at 22; EFSB-G-2(S3)(2) at 74-75; Tr. 2, at 342-343; Tr. 7, at 1007-1008.

**B. Noticed Variation to the Project**

The Noticed Variation follows the same 9.01-mile route as the Project, but consists of an overhead design along the MBTA ROW. Exh. EV-2, at 5-3. The Noticed Variation begins with a short segment of underground transmission line exiting the Sudbury Substation to the MBTA ROW, where it then transitions to an overhead line design along the MBTA ROW. Exh. EV-2, at 5-3. At Wilkins Street in the Town of Hudson, the line would transition to an underground design and proceed within the same roadways as the Project, terminating at Hudson Substation. Exh. EV-2, at 5-3.

**C. Noticed Alternative Route**

The Noticed Alternative Route consists of an underground transmission line design within public roadways for its entire length (10.30 miles). Exh. EV-2, at 5-4. The route traverses 5.46

[5] The Town of Stow Conservation Commission expressed its support for the Project as an underground transmission line in its comments on the Company's Environmental Notification Form. Tr. 9, at 1510; Exh. EFSB-G-1(3) at 340-341.

miles through Sudbury, 0.75 miles through Stow, and 4.09 miles through Hudson. Exh. EV-2, at 5-4. Beginning at Sudbury Substation, the route travels west along Boston Post Road/Route 20, then turns north onto Green Hill Road and proceeds west to Old Lancaster Road at the northern end of Green Hill Road. Exh. EV-2, at 5-4. The route follows Old Lancaster Road to the intersection with Hudson Road then turns west and continues along State Road in Stow and then to Main Street in Hudson. Exh. EV-2, at 5-4. At the intersection of Forest Avenue in Hudson, the route turns southwest to reach the Intel access road before terminating at Hudson Substation. Exh. EV-2, at 5-4.

**D. Substation Work**

1. Sudbury Substation

Eversource's Sudbury Substation is located at 163 Boston Post Road on approximately 8.9 acres of Company-owned property. Exh. EV-2, at 5-4. The installation of additional equipment will be required at Sudbury Substation regardless of whether the New Line is installed with an underground design (Project or Noticed Alternative) or an overhead design (Noticed Variation). Exh. EV-2, at 5-4 to 5-7. For all three options, all work necessary to accommodate the New Line termination at the Sudbury Substation will occur within the existing substation fence line and utilize existing access driveways. Exh. EV-2, at 5-5.

The specific equipment required for the Project includes:

- 115-kV breaker with associated disconnect switches;
- three 115-kV surge arresters;
- one 115-kV cable disconnect switch and three termination structures;
- 115-kV air core shunt reactor with associated foundations;
- 115-kV breaker with associated disconnects and foundations to switch the shunt reactor;

- shielding mast (approximately 100-feet tall);
- 115-kV bus support structure for 115-kV conductors;
- control, protection, and communication equipment inside the existing control house;
- underground conduits and cable trench for control cables and the transmission line; and
- a duct bank to route the New Line from Sudbury Substation to the MBTA ROW.

Exh. EV-2, at 5-5.

2. Hudson Substation[6]

The existing HLPD Hudson Substation is located at 49 Forest Avenue in Hudson. Exh. EV-2, at 5-8. The work required at Hudson Substation will be the same regardless of which variation or option is chosen. Exh. EV-2, at 5-8. To accommodate the New Line, the following equipment will be installed at Hudson Substation:

- three new 115-kV circuit breakers and associated disconnect switches;
- 115-kV cable termination structures;
- protective relaying; control house; modification of existing bus work;
- security infrastructure;
- two transmission towers to re-terminate existing H-160 & N-166 transmission lines with concrete foundations; and
- SCADA system and remote communications.

Exh. EV-2, at 5-8 to 5-9. It will be necessary to expand the limits of the existing fence line at Hudson Substation to install the equipment necessary to support the New Line. Exh. EV-2, at 5-9.

[6] Other than the New Line, the Company will not construct, own, operate or maintain any substation facilities at Hudson Substation. Exh. EV-2, at 5-8.

## E. Construction Methodology

### 1. Underground Along the MBTA ROW

The Project involves construction of an underground transmission line along the MBTA ROW in Sudbury and Hudson. Exh. EV-2, at 5-10. The New Line will consist of three cross-linked polyethylene ("XLPE") insulated cables.[7] Exh. EV-2, at 5-10. The duct bank will contain a total of eight conduits: four high density polyethylene ("HDPE") 8-inch-diameter conduits (including one spare) for the insulated XLPE cables, two 4-inch-diameter polyvinyl chloride ("PVC") conduits for relay and communication cables, and two 2-inch-diameter PVC conduits (one for a grounding conductor and one for possible future temperature-monitoring cables). Exh. EV-2, at 5-10. A common thermal concrete envelope encases the conduits to form the duct bank. Exh. EV-2, at 5-10. The typical duct bank trench detail will consist of a duct bank that is four feet wide and five and a half to eight feet deep, depending on the design profile of the duct bank. Exh. EV-2, at 5-10 to 5-11.

As discussed below, the phases and sequence of construction associated with the Project within the MBTA ROW from Sudbury Substation to Wilkins Street in Hudson, in the approximate order of implementation, includes: (1) vegetation removal; (2) implementation of erosion and sedimentation controls; (3) rail removal and access road subgrade construction; (4) construction of duct bank and splice vault system (including rehabilitation of existing railroad bridges); (5) cable pulling and splicing, testing and commissioning; (6) access road final grading, restoration and demobilization; and (7) operation and maintenance. Exh. EV-2, at 5-11. The Company will assign an Eversource construction supervisor to oversee the daily work performed by the contractor. Exh. EFSB-CM-5. The Company will have a contracted environmental inspector who

[7] The Company selected XLPE technology based on many factors, including the capacity needs and cost. Tr. 8, at 1309-1310.

will conduct weekly inspections of the erosion and sediment controls as well as other environmental permit conditions. Id. The construction contractor will have a project manager and construction supervisor to oversee daily work. Id. Contractors are required, through their contracts with Eversource, to understand and comply with Project permit conditions or requirements, as well as Eversource's Massachusetts Best Management Practices Manual (September 2016) ("BMP Manual").[8] Exhs. EV-2, at 5-9; Appendix 5-2 (R-1); EV-2, EFSB-CM-6; Tr. 9, at 1,544-45. To ensure compliance is met before the start of construction, the Company uses a Construction Authorization Notice ("CAN"), which requires those individuals responsible for compliance, both Eversource and contractor(s), to acknowledge on the CAN that they received, read, and understand the environmental requirements. Exh. EFSB-CM-6. During construction, weekly inspections are performed and Eversource construction and environmental inspectors will enforce the installation and use of Best Management Practices ("BMPs"). If a BMP is not adhered to during construction, work will not be allowed to proceed until the deficiency is corrected. Id.

a. Vegetation Removal

Vegetation management contractors will access the MBTA ROW primarily from existing public ways. Exhs. EV-2, at 5-11; EV-16, at 5-4; EFSB-LU-17. Prior to the start of construction, the proposed clearing limits will be surveyed and staked, and trees will be visibly marked for removal. Exh. EV-2, at 5-11. Prior to vegetation removal, the boundaries of wetlands will be clearly marked to prevent unauthorized encroachment. Exh. EV-2, at 5-11. The Company will provide environmental compliance training and copies of all applicable permits to the vegetation management crews prior to the commencement of work. Exh. EV-2, at 5-11.

[8] During all project activities (e.g. maintenance, construction), federal, state, and local regulatory authorities require steps be taken to avoid, minimize, and/or mitigate environmental impacts. Exh.. EV-2. Appendix 5-2, Section 2. The Company's BMPs have been developed to aid in this process. Id.

The Project requires an approximately 30-foot-wide corridor cleared of trees and woody shrubs to facilitate the installation of the duct bank/splice vault system and the access road. Exhs. EV-2, at 5-11; EV-16, at 5-4; SUD-DEIR-1-5. Any limbs that overhang the 30-foot corridor of clearing will be selectively cut, as needed, for construction vehicle access and operation. Exh. EV-16, at 5-4.[9] The affected limb will be cut in a manner that will maintain the health of the tree. Exh. EV-16, at 5-4. At each proposed splice vault location, the limits of clearing will be temporarily expanded to an approximate width of 40 to 50 feet, for a length of approximately 50 feet to accommodate installation of the vault. Exhs. EV-2, at 5-11; EV-16, at 5-4. Specific clearing requirements will be assessed when advanced engineering design is available. Exh. EV-2, at 5-11. The current level of design has minimized tree clearing to the extent practicable by locating the 22-foot platform along the existing rail bed, where there are not likely to be mature trees growing. Exh. EV-16, at 5-4. Furthermore, once construction is complete, the majority of the 82.5-foot-wide MBTA corridor will be vegetated; a 22-foot-wide corridor will be maintained, and the area above the duct bank will consist of low growing (shallow root) herbaceous vegetation. Exh. EV-16, at 5-4; Tr. 9, at 1443. Only the 14-foot-wide access road will not be vegetated. Exhs. EV-16, at 5-4; RR-EFSB-58(1) at 6.

Tree removal will consist of cutting trunks as close to the ground as possible and leaving the stumps and roots in place, except where grading for construction of the access road and installation of the New Line requires grubbing of stumps and roots. Exhs. EV-2, at 5-11 to 5-12; EV-16, at 5-4. Tree trunks and large limbs will be cut, and smaller limbs and brush will be chipped and then removed from the MBTA ROW. Exhs. EV-2, at 5-12; EV-16, at 5-4. Selective cutting

[9] The Company will continue to evaluate the necessary tree clearing width as Project design advances to minimize tree clearing to the extent practicable, particularly in certain sensitive areas. Exhs. SUD-DEIR-5; SUD-DEIR-7; RR-SUD-10.

of vegetation along existing stream banks will minimize the disturbance of bank soils and limit the potential for erosion. Exhs. EV-2, at 5-12; EV-16, at 5-4. Where appropriate, and/or when permit conditions require, felled trees may remain to decompose in place to avoid disturbing saturated soil and to provide wildlife habitat after construction of the access road and New Line. Exhs. EV-2, at 5-12; EV-16, at 5-4. Typical equipment used to clear vegetation includes tree shears, brush mowing units, a skidder bucket and/or manual climbers, a forwarder or tree dump truck, and a chipper with a winch. Exh. EV-16, at 5-4. Hand cutting using chainsaws and brush saws may be necessary in environmentally sensitive areas such as wetlands. Exh. EV-16, at 5-4.

b. Implementation of Erosion and Sedimentation Controls

Following vegetation removal activities, erosion and sediment controls such as straw bales, silt fence, and/or straw wattles will be installed in accordance with Eversource's BMP Manual and with any applicable permit requirements.[10] Exhs. EV-2, at 5-12; EV-16, at 5-5; EFSB-CM-4. The Company's Construction Supervisor and designated Environmental Monitor will oversee the installation of erosion controls by the Company's contractor. Exhs. EV-2, at 5-12; EV-16, at 5-5. The erosion and sediment controls will be installed between the work area and environmentally sensitive areas, such as wetlands, streams, drainage courses, roads, and adjacent property. Exhs.

[10] While erosion controls are typically installed prior to earth disturbance activities, they may be installed prior to clearing activities if determined to be necessary. As the Project progresses through the final design phase, the Company will consult with the Massachusetts Natural Heritage and Endangered Species Program and other permit-issuing authorities such as the local Conservation Commissions and MassDEP, to develop a detailed erosion control and construction sequencing plan that allows construction to proceed, protects adjacent wetland resources, and includes measures that may allow wildlife to move through the construction area during off-hours. In any event, erosion controls to protect wetland resource areas will be installed pursuant to Orders of Conditions issued by the relevant Conservation Commissions. Exh. SUD-CM-14.

EV-2, at 5-12; EV-16, at 5-5. These controls will be inspected regularly and promptly repaired or replaced, as needed.[11] Exhs. EV-2, at 5-12; EV-16, at 5-5; EFSB-CM-5.

c. Rail Removal and Access Road Construction

The conversion of the existing rail bed to an access road requires the removal and salvage of the steel rails and disposal of the wooden rail ties prior to grading and leveling, in accordance with all applicable regulations. Exhs. EV-2, at 5-12; EV-16, at 5-5. A detailed cut and fill analysis has been developed as the Project advances to the final design to meet the final grades required to construct the access road along the MBTA ROW. Exhs. EV-2, at 5-12; EFSB-CM-1(S-1); EFSB-CM-1(S-1)(1) through (3); SUD-CM-16(S-1); EV-16, at 5-5. Excess soil that is not reused for the construction platform will be removed from the construction area and transported to a temporary construction laydown area. Exh. EV-2, at 5-12. The Project is currently projected to result in an excess quantity of soil that will be pre-characterized and directly removed from the Project area when practical. Exh. EV-16, at 5-5; Tr. 10, at 1639. The Company will manage soils pursuant to all applicable regulations. Exhs. EV-2, at 5-12; EV-16, at 5-5. If required, excess soil from the in-road portion of the construction area will be pre-sampled and direct-shipped to their ultimate disposal location. Tr. 10, at 1625. They will not be stored for any reuse . Id. Excess soil on the MBTA ROW will remain on the ROW until characterization and export logistics are completed. Exh. EV-16, at 5-5.

Soil stockpiles will be managed in accordance with Eversource's BMP Manual, which specifies that stockpiles are located outside sensitive areas to the extent practical and management

[11] The Company uses several practices to minimize the spread of invasive species associated with excavation and removal of soils. Seed-free erosion controls are used (e.g., straw bales, straw wattles and mulch). Soil stabilization and restoration are done with weed-free seed mix. In addition, vehicles and equipment used for construction will be cleaned each day prior to entering the ROW to reduce the transport of off-site seed. Exhs. EFSB-LU-32 and SUD-WH-13(a).

to prevent erosion and sedimentation of adjacent areas. Exh. EV-16, at 5-5. Typical measures include the installation of protective measures (e.g., siltation fence or straw bales) around the perimeter of the stockpile. Exh. EV-16, at 5-5. The stockpile must be seeded if left in place for more than 30 days. Exh. EV-16, at 5-5.

The proposed access road will support construction activities and future maintenance of the New Line. Exh. EV-2, at 5-12. The subgrade of the access road will facilitate development of a multi-use path that the DCR has planned within the MBTA ROW. Exh. EV-2, at 5-12 to 5-13. Within the 30 feet of clearing, a 22-foot-wide construction platform will be developed that consists of:

- a 14-foot-wide access road (10-foot road surface with 2-foot shoulders on each side);
- a 4-foot-wide duct bank (offset from the access road by one foot);
- splice vaults (requiring additional workspace outlined below); and
- 4 feet of additional construction area to facilitate installation of the duct bank.

Exhs. EV-2, at 5-13; EV-16, at 5-2; Tr. 4, at 697.

At proposed splice vault locations, a temporary work pad approximately 40 to 50 feet wide by 50-feet long will be necessary to support cranes and other specialized equipment that are required during vault installations and cable pulling and splicing. Exhs. EV-2, at 5-13; EV-16, at 5-6; Exh. EFSB-CM-20. All temporary work pads for the splice vaults will be reduced to a uniform 22-foot-wide construction platform following installation of the splice vaults and the pulling and splicing of the cable. Exhs. EV-2, at 5-13; EV-16, at 5-6. Due to size, most of the splice vaults will be located partially under the 14-foot access road with the manhole covers adjacent to the travel way and in the shoulder. Exhs. EV-2, at 5-13; EV-16, at 5-6. The access road will be designed to support construction and maintenance vehicles. Exhs. EV-2, at 5-13; EV-16, at 5-6.

d. Construction of Duct Bank and Splice Vault System Within MBTA ROW.

The installation of pre-cast concrete splice vaults will follow the completion of the 22-foot wide construction platform to facilitate cable installation and splicing and enable access for maintenance and future repairs. Exhs. EV-2, at 5-13; EV-16, at 5-7. Each splice vault will be approximately 8-feet wide by 8-feet high and 24-feet long. Tr. 8, at 1312. The splice vault depth will vary by location, with the base measuring approximately 12 to 15 feet below the proposed final grade of the access road. Exhs. EV-2, at 5-13; EV-16, at 5-7. The splice vaults will be located entirely underground with only manhole covers being visible at ground level at final grade. Exhs. EV-2, at 5-13; EV-16, at 5-7. At each splice vault, a precast communication hand hole measuring four feet by four feet by four feet will be installed parallel (i.e., adjacent) to each splice vault. Exhs. EV-2, at 5-13; EV-16, at 5-7; SUD-CM-8; SUD-CM-35; SUD-CM-35(1). Splice vaults for the Project will be spaced approximately every 1,500 to 1,800 feet along the Project route. Exhs. EV-2, at 5-14; EV-16, at 5-7. Placement of the splice vaults is determined by several factors including, but not limited to: allowable pulling tensions; sidewall pressure on the cables as they are pulled around a bend; the maximum length of a cable that can be transported on the width, height, and weight of the cable reel; and accessibility of the site based on existing environmental constraints. Exhs. EV-2, at 5-14; EV-16, at 5-7. Based on current Project design, of the 29 splice vaults anticipated to be installed for the Project, 25 are expected to be located along the MBTA ROW portion of the Project route. Exh. EFSB-CM-9. None of the splice vaults would be installed directly within any conservation areas or wetlands. Exh. EFSB-CM-25.

The excavation for the splice vault will be shored as required by soil conditions and U.S. Occupational Safety and Health Administration safety regulations and local and state requirements. Exhs. EV-2, at 5-14; EV-16, at 5-7. The work area will be secured during non-working hours. Exhs. EV-2, at 5-14; EV-16, at 5-7. It is anticipated that each splice vault will

take approximately five to seven days to install. Exhs. EV-2, at 5-14; EV-16, at 5-7. Once the splice vaults have been installed, trenching will begin for installation of the duct bank. Exhs. EV-2, at 5-14; EV-16, at 5-7. Once a portion of the trench is prepared, each of the conduit sections will be assembled inside the trench or pre-assembled at the ground surface and lowered into the trench. Exhs. EV-2, at 5-14; EV-16, at 5-7. High-strength thermal concrete (3,000 pounds per square inch ("psi")) will be placed in the area around the conduit to create the duct bank to protect the cable. Exhs. EV-2, at 5-14; EV-16, at 5-7. The trench will then be back-filled with fluidized thermal backfill or native soil. Exhs. EV-2, at 5-14; EV-16, at 5-7. The duct bank will likely be installed above all existing culverts along the MBTA ROW. Exhs. EV-2, at 5-14; EFSB-CM-13; EFSB-CM-13(1). In specific areas where the Company determines that the existing culvert cover is inadequate, the plan is to incorporate the need for additional cover into the cut and fill design. Exh. EFSB-CM-13.

In addition, there are three existing bridges over waterbodies along the MBTA ROW. Exhs. EV-2, at 5-14; EFSB-CM-2. The Company anticipates that the Hop Brook bridges will be rehabilitated and retrofitted with new timber decks and timber railings. Exh. SUD-DEIR-46. If rehabilitation of the bridge is determined not to be feasible due to cost or the difficulty of constructing the rehabilitation measures, the Company will consider construction of a new bridge in the place of the existing bridge. Id. For the third existing bridge (the Fort Meadow Brook bridge), the Company intends to install a new, dedicated utility crossing bridge that is designed as a single span structure to avoid in-water work. Exh. EV-16, at 5-7; Tr. 1, at 131. The bridge improvements will also incorporate the future multi-use path, in accordance with DCR's proposed design plans. Exh. EV-2, at 5-14.

Equipment used during construction of the Project within the MBTA ROW may include: concrete trucks, dump trucks to transport fill materials to and from work sites, and bulldozers, excavators, backhoes, and graders to place fill materials or to make cuts to achieve the proper profile. Exh. EV-16, at 5-7. Flat-bed trailer trucks will deliver the pre-cast concrete splice vaults to their proposed locations and cranes will be used to pick and place splice vaults. Exh. EV-16, at 5-7. Throughout the Project, pick-up trucks will transport crews and small equipment to the work areas. Exh. EV-16, at 5-7. Low-bed trailers will transport cable reels, and tracked equipment to the work sites. Exh. EV-16, at 5-7.

e. Cable Pulling, Splicing, Testing and Commissioning

Each conduit is tested and cleaned by pulling a mandrel (a close-fitting cylinder designed to confirm a conduit's shape and size) and swab through each of the ducts, prior to cable installation. Exhs. EV-2, at 5-14 to 5-15; EV-16, at 5-8. The cables are installed in sections between two adjacent splice vaults. Exhs. EV-2, at 5-15; EV-16, at 5-8. A cable reel is set up at the "pull-in" splice vault and a cable puller is set up at the "pull-out" splice vault. Exhs. EV-2, at 5-15; EV-16, at 5-8. Once the mandrel and pulling line are pulled through each duct, a hydraulic cable winch and tensioner are used to pull cables individually between the pull-in and pull-out splice vaults. Exhs. EV-2, at 5-15; EV-16, at 5-8. Installation of cable sections typically takes three 8-hour days and is repeated until all cables are installed. Exhs. EV-2, at 5-15; EV-16, at 5-8.

Adjacent cable sections are then spliced together inside the vaults over the course of several extended work days. Exhs. EV-2, at 5-15; EV-16, at 5-8. Splicing high-voltage solid-dielectric transmission cable is a time-consuming, complex operation that typically requires 40 to 60 hours to splice all three cables at each vault. Exhs. EV-2, at 5-15; EV-16, at 5-8. The splicing activities are not continuous but take place over four or five extended (12-hour) workdays at each splice

vault location. Exhs. EV-2, at 5-15; EV-16, at 5-8; EFSB-NO-2(S1). The splicing operation requires a specialized splicing van and a generator. Exhs. EV-2, at 5-15; EV-16, at 5-8. The splicing van will contain all the equipment and material needed to make a complete splice. Exhs. EV-2, at 5-15; EV-16, at 5-8. An air conditioning unit may be used to control the moisture content in the splice vaults during the splicing activity. Exhs. EV-2, at 5-15; EV-16, at 5-8. A portable generator will provide the electrical power for the splicing van and air conditioning unit and will be muffled to minimize noise. Exhs. EV-2, at 5-15; EV-16, at 5-8. Typically, the splicing van will be located over one splice vault access cover. Exhs. EV-2, at 5-15; EV-16, at 5-8. The air conditioner will be located near the second splice vault access cover and the generator will be in a convenient area nearby out of the immediate work zone. Exhs. EV-2, at 5-15; EV-16, at 5-8.

Once the electric line conductor is installed and spliced in electric cable manholes, the communications fiber cable will be pulled and spliced in the communications manholes. Exhs. EV-2, at 5-15; EV-16, at 5-8. Pulling the communications fiber cable is a faster operation because the communications fiber cable is a single strand and is smaller than the electric cable. Exhs. EV-2, at 5-15; EV-16, at 5-8. Up to three sections can be pulled per day. Exhs. EV-2, at 5-15; EV-16, at 5-8. A cable reel will be set up at the "pull-in" manhole and a cable puller will be setup at the "pull-out" manhole. Exhs. EV-2, at 5-15; EV-16, at 5-8. A hydraulic cable pulling winch and tensioner will be used to pull the fiber cable from its pull-in manhole to the pull-out manhole. Exhs. EV-2, at 5-15; EV-16, at 5-8. Once all adjacent communications fiber cable sections are installed, they will be spliced together inside the communications manholes. Exhs. EV-2, at 5-15; EV-16, at 5-8. Like splicing for the transmission cables, splicing of the communications fiber cable will not be continuous. It will require a splicing van, portable generator, and air conditioning unit. Exhs. EV-2, at 5-15; EV-16, at 5-8. Splicing the communications fiber cable typically

requires three (10-hour) work days to complete at each of the communications manholes. Exhs. EV-2, at 5-15; EV-16, at 5-8.

Once the cable system installation is complete, the cables will be field-tested from the substations. Exhs. EV-2, at 5-15; EV-16, at 5-8. Among other steps, the Company will perform a direct current proof test over the entire system to check for anomalies in the overall system, most notably at splices and terminations. Exh. EFSB-CM-17. The cable system is then placed under an electrical soak for 24 hours (i.e., energized but carrying zero load). Exh. EFSB-CM-17. At the completion of successful testing, the line will be energized, and load will be placed upon the line. Exhs. EV-2, at 5-15; EV-16, at 5-8; EFSB-CM-17.

f. Access Road Final Grading, Restoration and Demobilization

Following the installation of the New Line, soils disturbed during construction will be stabilized with an appropriate seed mixture and/or mulch in accordance with applicable regulations and in coordination with DCR. Exhs. EV-2, at 5-16; EV-16, at 5-9. The Company will follow the MassDEP guidance document, "Best Management Practices for Controlling Exposure to Soil during the Development of Rail Trails." Exhs. EV-2, at 5-16, App. 5-3; EV-16, at 5-9; EFSB-HW-6; EFSB-HW-8; TOH-HM-1; PROTECT-2-27. At the completion of the Project, the temporary construction access areas will be restored, and all equipment and construction debris will be removed from the MBTA ROW. Exhs. EV-2, at 5-16; EV-16, at 5-9. Temporary erosion and sedimentation control measures will be removed when site stabilization is achieved. Exhs. EV-2, at 5-16; EV-16, at 5-9.

g. Operation and Maintenance

Vegetation along a section of the MBTA ROW will be maintained and managed by the DCR to provide for both the use multi-use path and the reliable operation of the Project. Exhs. EV-2, at 5-16; EV-16, at 5-9. Of the approximately 82.5-foot-wide MBTA ROW, it is anticipated

that the maintained area will consist of an approximately 22-foot-wide corridor. Exh. EV-16, at 5-9. The Company plans to promote revegetation of all but 14 feet (along the access road) of the 30 feet of clearing, with herbaceous vegetation above the duct bank and woody vegetation allowed in the remainder of the 22-foot corridor. Exh. EV-16, at 5-9.

The Company has come to an agreement with the DCR regarding responsibility for vegetation management on the MBTA ROW and expects to finalize a memorandum of understanding ("MOU") with DCR memorializing this agreement at the end of the MEPA process. Tr. 9, at 1492. The MOU addresses, among other topics, project coordination, trail way improvements and vegetation and maintenance activities. Exhs. EV-16, at 5-9; SUD-G-20(S3)(1). The Company expects to install its facilities and construct the gravel base that will be used for the DCR's MCRT, and the DCR intends to add a top coat to the gravel base. Exh. EV-16, at 5-9. The Company will work with DCR to loam and seed the shoulders. Tr. 4, at 694.

Once the DCR constructs the MCRT, the gravel base and the MCRT will be under the care and control of the DCR. Exhs. EV-16, at 5; SUD-G-20(S3)(1). The DCR will be responsible for the MCRT and the maintenance of the MCRT and all the DCR's trail-related improvements. Id. The DCR will carry out maintenance activities (e.g., mowing, trimming) associated with the maintained area over the trench and on the shoulders of the multi-use trail. Exhs. EV-2, at 5-16; EV-16, at 5-9; SUD-G-20(S3)(1); Tr. 9, at 1491-1492. Vegetation management will conform with the DCR Trail Guidelines and Best Practices Manual (the "DCR Manual") where applicable and all applicable state and federal permitting conditions and laws. Exhs. EV-2, at 5-16; EV-16, at 5-9; EFSB-LU-11; EFSB-LU-11(1); EFSB-LU-30; SUD-G-20(S3)(1). The DCR Manual indicates that work activities should be consistent with the Massachusetts Wetlands Protection Act,

Massachusetts Endangered Species Act, and Massachusetts Historical Commission regulations. Exh. EV-16, at 5-9.

2. Underground within Public Roadways

The Project includes underground construction within roadways for approximately 1.37 miles. Exh. EV-2, at 5-21. The underground portion begins at the intersection of the MBTA ROW and Wilkins Street in Hudson and follows Wilkins Street (Route 62) to Forest Avenue before terminating at the Hudson Substation.[12] Exh. EV-2, at 5-21. The phases of construction associated with the installation of the New Line within public roadways including the following: (1) implementation of erosion control; (2) splice vault installation; (3) roadway trench excavation, duct bank installation, and pavement restoration; (4) cable pulling, splicing, and testing in roadways; and (5) final pavement restoration. Exh. EV-2, at 5-21 to 5-22.

a. Implementation of Erosion Control

Prior to the start of any earth disturbance activities, the Company will install all appropriate erosion control measures to protect any adjacent wetland and water resources in accordance with any applicable permit requirements. Exhs. EV-2, at 5-22; EV-16, at 5-11.

b. Splice Vault Installation

Installation of the pre-cast concrete splice vaults will occur prior to installation of the conduit bank. Exhs. EV-2, at 5-22; EV-16, at 5-11. Pre-cast concrete splice vaults facilitate cable installation and splicing and allow access for maintenance requirements and future repairs. Exhs. EV-2, at 5-22; EV-16, at 5-11. Each splice vault would be approximately 8-feet wide by 8-feet

[12] The Noticed Alternative Route is 10.30 miles and is an underground design within roadways for the entire length. Exh. EV-2, at 5-21. This route begins at Sudbury Substation and traverses through Sudbury along Boston Post Road/Route 20, Green Hill Road, Old Lancaster Road, and Hudson Road, then crosses into Stow along State Road and into Hudson on Main Street. Id. From there, the route travels along Forest Avenue before terminating at Hudson Substation. Id.

high and 24-feet long. Tr. 8, at 1312. The splice vault depth would vary by location with the splice vault base approximately 12 to 15 feet below grade. Exhs. EV-2, at 5-22; EV-16, at 5-11. Like the underground portions of the Project in the MBTA ROW, the splice vaults would be located entirely underground; the only visible aspects at ground level would be the manhole covers. Exhs. EV-2, at 5-22; EV-16, at 5-11. At each splice vault, a precast communication handhole measuring 4 feet by 4 feet by 4 feet would be installed parallel to the splice vault. Exhs. EV-2, at 5-22; EV-16, at 5-11.

Splice vaults would be spaced approximately 1,500 to 1,800 feet apart. Exhs. EV-2, at 5-22; EV-16, at 5-11. The factors contributing to final placement of the splice vaults include allowable pulling tensions; sidewall pressure on the cables as they are pulled around a bend; the maximum length of a cable that can be transported on the width, height, and weight of the reel; and accessibility. Exhs. EV-2, at 5-22; EV-16, at 5-11 to 5-12. Each splice vault is expected to take approximately seven to ten days to install due to construction restrictions associated with traffic and work hour limitations. Exhs. EV-2, at 5-23; EV-16, at 5-12. It is anticipated that installation of splice vaults within public roadways will take longer than along the MBTA ROW due to work hours and traffic-related restrictions typically associated with construction in streets, affecting the contractor's ability to set up and leave a crane in place. Exhs. EV-2, at 5-22; EV-16, at 5-12. In addition, it is expected that the contractor will encounter a higher density of underground utilities within streets that are not present along the MBTA ROW, which would also potentially lead to a longer duration to install splice vaults within public roadways versus the MBTA ROW. Exhs. EV-2, at 5-22; EV-16, at 5-12. Based on current Project design, of the 29 manholes anticipated to be installed for the Project, only 4 are expected to be located along the in-road portion of the Project route. Exh. EFSB-CM-9.

As a last resort, some existing underground utilities in roadways may need to be relocated to create space for the new splice vaults. Exhs. EV-2, at 5-23; EV-16, at 5-12. If such relocations become necessary in certain locations, the Company would work with local communities and utility companies regarding these relocations on a case-by-case basis as splice vault locations are finalized and as far in advance of splice vault installations as practical. Exhs. EV-2, at 5-23; EV-16, at 5-12.

c. Roadway Trench Excavation, Duct Bank Installation and Pavement Restoration.

Following installation of the splice vaults, the underground duct bank construction will begin. Exhs. EV-2, at 5-23; EV-16, at 5-12. The primary method for underground duct bank construction in roadways is open-cut trenching. Exhs. EV-2, at 5-23; EV-16, at 5-12. For installation of the transmission line within roadways, the width of the trench would be marked on the street, Dig-Safe would be contacted, the location of existing utilities would be marked, and the pavement would be saw-cut. Exhs. EV-2, at 5-23; EV-16, at 5-12. Saw cutting provides a clean break in the pavement and defines the parameters of the trench for asphalt removal and trench excavation. Exhs. EV-2, at 5-23; EV-16, at 5-12.

Following saw cutting, the existing pavement would be removed with an asphalt bucket on an excavator and loaded into a dump truck with a backhoe. Exhs. EV-2, at 5-23; EV-16, at 5-12. Pavement material would be handled separately from excavated soil and would be recycled at an asphalt batching plant. Exhs. EV-2, at 5-23; EV-16, at 5-12. Subsequently, a backhoe/excavator would excavate the trench to the required depth. Exhs. EV-2, at 5-23; EV-16, at 5-12. In some areas, excavation may be done by hand to avoid disturbing existing utility lines and/or service connections. Exhs. EV-2, at 5-23; EV-16, at 5-12. A “clean trench” or “live loading” method would be used in which soil would be loaded directly into a dump truck to an off-site facility for

recycling, reuse, or disposal. Exhs. EV-2, at 5-23; EV-16, at 5-12. Soil would not be stockpiled along the edge of the roadway, thus reducing the size of the required work area and the potential for sedimentation or the creation of nuisance dust. Exhs. EV-2, at 5-23; EV-16, at 5-12. Any rock encountered during excavation would be removed by mechanical means and brought to an off-site facility for recycling, reuse, or disposal. Exhs. EV-2, at 5-23; EV-16, at 5-12.

In the event there are contaminated soils or other regulated materials encountered during construction, soils/materials would be managed pursuant to the Utility-Related Abatement Measure ("URAM") provisions of the Massachusetts Contingency Plan ("MCP"). Exhs. EV-2, at 5-23; EV-16, at 5-12; EFSB-LU-5; RR-EFSB-66. The Company would also contract with a licensed site professional ("LSP") as necessitated by conditions encountered along the Project alignment, consistent with the requirements of the MCP at 310 C.M.R. § 40.0460 et seq. Exhs. EV-2, at 5-23; EV-16, at 5-12.[13]

Once a section of the trench is prepared, each of the conduit sections would be assembled inside the trench or pre-assembled at the ground surface and then lowered into the trench. Exhs. EV-2, at 5-23; EV-16, at 5-13. The area around the conduit would be filled and protected with high-strength thermal concrete (3,000 psi) that creates a duct bank around the conduits. Exhs. EV-2, at 5-23 to 5-24; EV-16, at 5-13. The trench would then be back-filled with fluidized thermal backfill or native soil (to be determined by final cable design). Exhs. EV-2, at 5-24; EV-16, at 5-13. Each conduit would then be cleaned by pulling a mandrel and swab through each of the ducts. Exhs. EV-2, at 5-24; EV-16, at 5-13.

[13] The Company has contracted with an LSP to support construction planning and to ensure that Project-related construction activities are performed in conformance with BMPs and other Company policies. Exh. EFSB-HW-11.

The length of time for trench excavation, duct bank installation, and pavement patching in front of any single property would generally be two to three weeks. Exhs. EV-2, at 5-24; EV-16, at 5-13. As noted above, the installation of splice vaults (which is a separate operation from the trench work) would take an additional seven to ten days. Exhs. EV-2, at 5-24; EV-16, at 5-13. The pace of construction may be slower in areas of higher existing utility density, and especially where unanticipated obstructions, such as ledge or rock, are encountered, or where the trench depth is increased, or in areas of higher traffic volumes. Exhs. EV-2, at 5-24; EV-16, at 5-13.

The current preliminary design within public roadways assumes that it may be necessary to utilize trenchless crossing techniques, such as pipe jacking/jack and bore ("J&B"), or horizontal directional drilling ("HDD") at locations where existing culverts convey waterbodies underneath existing road ways. Exhs. EV-2, at 5-24; EV-16, at 5-13.[14] The need for and location of these trenchless crossings has been preliminarily determined but will be confirmed as the design is finalized. Exhs. EV-2, at 5-24; EV-16, at 5-13; EFSB-W-2; SUD-CM-17. Trenchless crossings can take two to three months each to complete. Exhs. EV-2, at 5-24; EV-16, at 5-13.

J&B: The J&B operation is used for short crossings (400 feet or less) of shallow waterways or under railroads and streets and would require digging a pit approximately 16 feet wide by 30-feet long; deep enough to go under the obstruction. Exhs. EV-2, at 5-24; EV-16, at 5-13. Sections of steel pipe would be "jacked" under the obstruction and the hole would be bored out as the pipe progress under the obstruction during the jacking activity. Exhs. EV-2, at 5-24; EV-16, at 5-13. The bore pit houses the drilling and jacking equipment, while a receiving pit on the other side of the obstruction receives the pipe. Exhs. EV-2, at 5-24; EV-16, at 5-13. Once in place, the outside

[14] The Company does not anticipate the need to use trenchless crossing techniques within the MBTA ROW for the preferred Project route. Exh. EFSB-CM-16. The Company expects to use open cut trenching techniques and specialized bridge crossing installation methods on the MBTA ROW. Exh. EFSB-CM-16.

of the pipe casing is grouted, and smaller HDPE or PVC pipes are installed inside the casing to contain the cables. Exhs. EV-2, at 5-24; EV-16, at 5-13. When completed, the casing would mate up with the duct bank on each side of the crossing. Exhs. EV-2, at 5-24; EV-16, at 5-13. Prior to cable installation, the casing is filled with a thermally designed fluidized fill. Exhs. EV-2, at 5-24; EV-16, at 5-13. Once the J&B equipment is in place, it must remain in place and the drill pits must remain open until the operation is completed. Exhs. EV-2, at 5-24; EV-16, at 5-13.

HDD: HDD is typically used for comparatively deeper and longer crossings, such as those under interstate highways, non-perpendicular crossing of railroads and other infrastructure or larger water bodies. Exhs. EV-2, at 5-25; EV-16, at 5-13. For a crossing involving the use of HDD, staging areas would be set up on both sides of the crossing. Exhs. EV-2, at 5-25; EV-16, at 5-13. The staging areas would require a larger temporary construction footprint than for J&B because the boring equipment is larger, and the supporting equipment requires more space. Exhs. EV-2, at 5-25; EV-16, at 5-13. Additional work area is also needed for pipe assembly. Exhs. EV-2, at 5-25; EV-16, at 5-14. Shallow pits would be required on both sides to collect the drilling fluid. Exhs. EV-2, at 5-25; EV-16, at 5-14.

A temporary drill rig, likely mounted on a trailer, would be hauled to the site and positioned to drill at the desired angle. Exhs. EV-2, at 5-25; EV-16, at 5-14. The drilling would be guided along a selected path, typically an arc, under the obstruction to the exit point on the opposite side. Exhs. EV-2, at 5-25; EV-16, at 5-14. The assembled steel pipe would then be pulled back through the hole. Exhs. EV-2, at 5-25; EV-16, at 5-14. The entire pipe would be grouted to seal the installation. Exhs. EV-2, at 5-25; EV-16, at 5-14. Due to the high risk that the bore hole could collapse, once the "pullback process" begins, it cannot be stopped until the entire length of the steel pipe is in place. Exhs. EV-2, at 5-25; EV-16, at 5-14. If an HDD fails at any point during

execution of the work, the existing drill would be abandoned, and the entire process would need to start again in an adjacent location. Exhs. EV-2, at 5-25; EV-16, at 5-14.

d. Cable Pulling, Splicing, and Testing in Roadways

The Company would generally follow the same cable pulling, splicing, and testing methods as those along the MBTA ROW, as described above. Exhs. EV-2, at 5-25; EV-16, at 5-14.

e. Final Pavement Restoration

Following installation of the duct bank and splice vaults, roadway surfaces would be restored to pre-construction condition or better, in compliance with applicable state standards and requirements of municipalities along the route. Exhs. EV-2, at 5-25; EV-16, at 5-14.

**F. Construction Schedule and Hours**

The Project is anticipated to require 18 months of construction. Exh. EV-2, at 5-26; Exh. EFSB-G-5.[15] Typical construction work hours for the Project are proposed to be from 7:00 a.m. to 7:00 p.m., Monday through Friday, and from 9:00 a.m. to 5:00 p.m. on Saturdays, when daylight and weather conditions allow.[16] Exhs. EV-2, at 5-26; EFSB-NO-2. In some instances, and as dictated by the Massachusetts Department of Transportation ("MassDOT"), or requested by the local municipal authority, the Company may be required to perform work at night to minimize daytime impacts to commuters and abutters. Exh. EV-2, at 5-26; Exh. EFSB-T-11. The Company will work with MassDOT and the local communities through the grant of location process to formalize allowable work hours and schedule. Exh. EV-2, at 5-26. Some work tasks, once started, may require continuous operation until completion. Exhs. EV-2, at 5-26; EFSB-NO-2(S1); RR-

[15] The Noticed Variation is estimated to require 12-16 months of construction (due to the need for less civil work than the Project) and the Noticed Alternative Route is estimated to require 24 months of construction (due to the additional length of the line and the potential limitations associated with construction within public streets). Exh. EV-2, at 5-26.

[16] The Company is seeking an exemption from the construction hour limitations in its Zoning Petition.

EFSB-92. Work requiring scheduled outages (i.e., work at existing substations and crossings of certain transportation and utility corridors) and work that requires continuous operation until completion may need to be performed on a limited basis outside of normal work hours, including evenings, Sundays and holidays. Exhs. EV-2, at 5-26; EFSB-NO-2(S1). In these cases, the Company will coordinate with the applicable municipality or MassDOT in the case of roads under MassDOT jurisdiction. Exh. EV-2, at 5-26.

### G. Community Outreach

The Company's extensive community outreach efforts to date have been aimed at briefing all stakeholders on the need for the Project, consulting with stakeholders on the route selection, detailing the overall Project schedule, and explaining the permitting and siting processes, including opportunities for public input. Exhs. EV-2, at 1-8, EFSB-G-6. The Company will continue outreach efforts during the licensing and permitting process and will take a hands-on, individualized approach to community outreach during the construction and restoration phases of the Project. Exhs. EV-2, at 1-8; EFSB-NO-16. Key elements of the Company's outreach program are described below.

Project Website, Hotline and E-mail. The Company has established a Project webpage to provide the public with basic Project information, maps, regular updates and contact resources.[17] Exh. EV-2, at 1-8. The website will be kept up-to-date for the duration of the Project. Exh. EV-2, at 1-8. In addition, a direct telephone hotline is actively monitored by personnel who respond to any request or concerns in a timely manner. Exh. EV-2, at 1-8. The Company has also a Project e-mail address for timely responses to property owner and other stakeholder questions, comments

[17] The Project website is available at: https://www.eversource.com/content/ema-c/about/projects-infrastructure/projects/massachusetts-transmission-projects/sudbury-to-hudson-project.

or concerns.[18] Exh. EV-2, at 1-8. Eversource is committed to responding promptly to all e-mail inquiries. Exh. EV-2, at 1-8. The hotline and email address are listed in all Project outreach materials, including fact sheets, subsequent mailings, the website and at all community events. Exh. EV-2, at 1-8.

Open Houses. The Company held pre-filing Open Houses to provide the public with opportunities to interact with Project subject matter experts, ask questions, and share concerns. Exh. EV-2, at 1-9. At the Open Houses, the Company provided information on the need for and benefits of the Project, described the siting process and opportunities for public input, explained the route selection process and provided details on Project design and location, schedule and construction activities. Exh. EV-2, at 1-9. The Open Houses were held in the Town of Hudson on March 15, 2016 and the Town of Sudbury on March 16, 2016. Exh. EV-2, at 1-9. The Company mailed invitations to property owners within 300 feet of the proposed project, identified through town certified lists, and to municipal officials in Sudbury, Marlborough, Stow and Hudson. Exh. EV-2, at 1-9. Newspaper advertisements for the Open Houses were also published in the Marlborough Enterprise, Hudson Sun, Metro West Daily News, and the Sudbury Town Crier. Exh. EV-2, at 1-9.

Municipal and Stakeholder Briefings. The Company has met with municipal officials, special interest groups, regulatory agencies and other stakeholders in Sudbury, Marlborough, Stow and Hudson. Exhs. EV-2, at 1-9 to 1-12, Table 1-1; EFSB-G-6. The Company conducted almost 60 outreach meetings with these stakeholders prior to filing the Petition. Id.

Construction Community Outreach Plan. Eversource will execute a comprehensive community outreach plan to keep property owners, businesses, and municipal officials, including

[18] The Project e-mail address is TransmissionInfo@eversource.com.

fire, police, and emergency personnel, up-to-date on planned construction activities. Exhs. EV-2, at 1-8; EFSB-T-1. Prior to the start of construction in each area, Eversource will notify municipal officials and dedicated field outreach personnel will perform door-to-door outreach to inform abutting property owners, residents, and businesses of planned construction start and work schedule. Exh. EV-2, at 1-8. The Company will provide regular communications and work closely with both abutters and municipal officials to minimize construction impacts throughout the construction duration. Exh. EV-2, at 1-8 to 1-9. The outreach plan will also include: (1) in-person pre-construction briefings with municipalities, abutting residences and businesses, and other stakeholder groups, as requested, to outline the overall construction process, key milestones, and expected timelines; (2) regular e-mail updates to municipal officials; (3) periodic letters or door hangers provided to abutters and other stakeholders regarding advance notice of scheduled construction activities and/or milestone construction activities; (4) work area signage as appropriate; and (5) outreach staff available to meet with affected property owners prior to each major stage of construction. Exhs. EV-2, at 1-9; EFSB-NO-16; Tr. 13, at 2386.

**H. Costs**

The planning level cost estimate (-25%/+25%) for the Project is approximately $95.8 million (2018 dollars). Exhs. RR-EFSB-50; RR-EFSB-50(1). This includes $87.0 million for construction of the proposed New Line and $3.8 million for Sudbury Substation upgrades. Exh RR-EFSB-50(1).[19]

[19] The total cost estimate also includes $5 million for work at HLPD's substation. Exhs. RR-EFSB-50; RR-EFSB-50(1).

## IV. JURISDICTION AND SCOPE OF REVIEW

### A. G.L. c. 164, § 69J

The Company filed the Siting Board Petition in accordance with G.L. c. 164, § 69J, which requires a project applicant to obtain Siting Board approval for the construction of jurisdictional energy facilities before a construction permit may be issued by any other state agency. Pursuant to G.L. c. 164, § 69G, jurisdictional facilities are defined to include a "new electric transmission line having a design rating of 69 kilovolts or more and which is one mile or more in length on a new transmission corridor" and any "ancillary structure which is an integral part of the operation of any transmission line which is a facility."

In accordance with G.L. c. 164, § 69J, before approving a petition to construct facilities, the Siting Board requires an applicant to justify its proposal in four phases. First, the Siting Board requires the application to show that additional energy resources are needed. Second, the Siting Board requires the applicant to establish that, on balance, its proposed project is superior to alternative approaches in terms of cost, environmental impact, reliability and ability to address the identified need. Third, the Siting Board requires the applicant to show that it has considered a reasonable range of practical facility siting alternatives and that the proposed site (or route) for the facility is superior to a noticed alternative site (or route) in terms of cost, environmental impact and reliability of supply. Lastly, the applicant must show that its plans for construction of its new facilities are consistent with the current health, environmental protection and resource use and development policies as developed by the Commonwealth. As demonstrated throughout this proceeding, the Project satisfies the Siting Board's standards and relevant precedent for jurisdictional facilities.

**B. G.L. c. 164, § 72**

G.L. c. 164, § 72 requires, in relevant part, that an electric company seeking approval to construct a transmission line must file with the Department a petition for:

> authority to construct and use or to continue to use as constructed or with altered construction a line for the transmission of electricity for distribution in some definite area or for supplying electricity to itself or to another electric company or to a municipal lighting plant for distribution and sale . . . and shall represent that such line will or does serve the public convenience and is consistent with the public interest . . . The [D]epartment, after notice and a public hearing in one or more of the towns affected, may determine that said line is necessary for the purpose alleged, and will serve the public convenience and is consistent with the public interest.[20]

The Department considers all aspects of the public interest in making a determination under Section 72. NSTAR Electric Company d/b/a Eversource Energy, EFSB 14-04/D.P.U. 14-153/14-154, at 164 ("Eversource Mystic-East Eagle"); NSTAR Electric Company d/b/a Eversource Energy, EFSB 14-02/D.P.U. 14-73/14-74, at 100 ("Eversource Walpole-Holbrook"); NSTAR Electric Company d/b/a Eversource Energy, EFSB 15-03/D.P.U. 15-64/15-65, at 83 ("Eversource Mystic-Woburn"); see Boston Edison Company v. Town of Sudbury, 356 Mass. 406, 419 (1969) ("Boston Edison"). Section 72, for example, permits the Department to prescribe reasonable conditions for the protection of the public safety. Eversource Mystic-East Eagle at 164; Eversource Walpole-Holbrook at 100; Eversource Mystic-Woburn at 84 citing Boston Edison, 356 Mass. at 419-20. All factors affecting any phase of the public interest and public convenience are

[20] Pursuant to statute, the electric company must file with its petition a general description of the transmission line, provide a map or plan showing its general location, and estimate the cost of the facilities in reasonable detail. G.L. c. 164, § 72. The Company included all of this necessary information as part of the Section 72 Petition. Exh. EV-8. In addition, in compliance with the Department's Section 72 Checklist, the Company provided the following information: (1) a draft hearing notice (Exh. EV-1, Attachment 1); (2) United States Geological Survey ("USGS") locus maps and diagrams of the proposed transmission line route (Exh. EV-2, at Section 4); and (3) a list of all permits needed for the Project (Exh. EV-2, at 6-7).

weighed by the Department in a determination under Section 72. Town of Sudbury v. Department of Public Utilities, 343 Mass. 428, 430 (1962).

In evaluating petitions filed under Section 72, the Department examines: (1) the need for, or public benefits of, the present or proposed use; (2) the environmental impacts or any other impacts of the present or proposed use; and (3) the present or proposed use and any alternatives identified. Eversource Mystic-East Eagle at 164; Eversource Walpole-Holbrook at 100-01; Eversource Mystic-Woburn at 84. The Department then balances the interests of the general public against the local interest and determines whether the line is necessary for the purpose alleged and will serve the public convenience and is consistent with the public interest. Id.

Given the nearly identical statutory standards in Section 72 and Section 69J, the Department and the Siting Board have been granted the statutory authority to conduct coordinated reviews of jurisdictional transmission lines. See G.L. c. 25, § 4; G.L. c. 164, § 69H. Because the Project will contribute to a necessary supply of energy for the Commonwealth with a minimum impact on the environment at the lowest possible cost, there is a need for, and public benefits from, the construction and operation of the proposed transmission lines. Cambridge Electric Light Company, 12 DOMSB 305, EFSB 00-3/D.T.E. 00-103, at 52-53 (2001) ("Cambridge Electric"). Accordingly, pursuant to Section 72, the Project is necessary for the purpose alleged, will serve the public convenience and is consistent with the public interest. Id. at 56-57.

**C. G.L. c. 40A, § 3**

G.L. c. 40A, § 3 provides, in relevant part, that:

> Land or structures used, or to be used by a public service corporation may be exempted in particular respects from the operation of a zoning ordinance or bylaw if, upon petition of the corporation, the [Department] shall, after notice given pursuant to section eleven and public hearing in the town or city, determine the exemptions required and find that the present or proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public.

A petitioner seeking exemption from a local zoning bylaw under G.L. c. 40A, § 3 must meet three criteria. First, the petitioner must qualify as a public service corporation. Save the Bay, Inc. v. Department of Public Utilities, 366 Mass. 667 (1975) ("Save the Bay"); Eversource Walpole-Holbrook at 90; Eversource Mystic-Woburn at 77; NSTAR Electric Company d/b/a Eversource Energy, D.P.U. 15-85, at 3 (2016) ("Eversource Woburn"). Second, the petitioner must demonstrate that its present or proposed use of the land or structure is reasonably necessary for the public convenience or welfare. Eversource Walpole-Holbrook at 90; Eversource Mystic-Woburn at 77; Eversource Woburn at 3; Tennessee Gas Pipeline Company, D.T.E. 01-57, at 3-4 (2002). Third, the petitioner must establish that it requires an exemption from the zoning ordinance or bylaw. Eversource Walpole-Holbrook at 90; Eversource Mystic-Woburn at 77; Eversource Woburn at 3; Boston Gas Company, D.T.E. 00-24, at 3 (2001).

## V. THE PROJECT SATISFIES THE STANDARDS FOR SECTION 69J APPROVAL

### A. The Company Has Established That the Project Is Needed.

#### 1. Standard of Review

G.L. c. 164, § 69J provides that the Siting Board should approve a petition to construct if the Board determines that the petition meets certain requirements, including that the applicant's proposed facilities are consistent with the policies stated in G.L. c. 164, § 69H to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the least possible cost. In carrying out its statutory mandate, the Siting Board must find that additional energy resources are needed as a prerequisite to approving a proposed energy facility. Eversource Mystic-East Eagle at 8; Eversource Walpole-Holbrook at 6; Eversource Mystic-Woburn at 6. The Siting Board evaluates whether there is a need for additional energy resources to meet: (1) reliability objectives; (2) economic efficiency objectives; or (3) environmental objectives.

Eversource Mystic-East Eagle at 8; Eversource Walpole-Holbrook at 7; Eversource Mystic-Woburn at 6; NSTAR Electric Company, 19 DOMSB 1, EFSB 10-2/D.P.U. 10-131/10-132, at 4 (2012) ("Lower SEMA"). Accordingly, the need for a particular facility can be demonstrated by showing need on any (or all) of those three bases. ECC Remand, 1 DOMSB 213, EFSB 90-100R at 180-81, n.264 (1993); see Eversource Mystic-East Eagle at 8; Eversource Walpole-Holbrook at 7; Eversource Mystic-Woburn at 6; Lower SEMA at 4.[21]

To ensure reliability, each transmission and distribution company establishes planning criteria for construction, operation, and maintenance of its transmission and distribution system. Compliance with the applicable planning criteria demonstrates a "reliable" system. Eversource Mystic-East Eagle at 8-9; Eversource Walpole-Holbrook at 7; Eversource Mystic-Woburn at 6-7; Boston Edison Company d/b/a NSTAR Electric, 14 DOMSB 233, EFSB 04-1/D.T.E. 04-5/04-7, at 7-8 (2005) ("NSTAR Stoughton").

To determine whether system improvements are needed, the Siting Board: (1) examines the reasonableness of the applicant's system reliability planning criteria; (2) assesses whether reviewable and appropriate methods for assessing system reliability over time are used based on system modeling analyses or other valid reliability indicators; (3) determines whether the relevant

[21] The Siting Board's review of proposed transmission facilities is conducted pursuant to G.L. c. 164, § 69J. This section states, in part, that "[n]o applicant shall commence construction of a facility at a site unless . . . in the case of an electric or gas company which is required to file a long-range forecast pursuant to section sixty-nine I, that facility is consistent with the most recently approved long-range forecast for that company." The Siting Board has noted that, pursuant to Chapter 164 of the Acts of 1997 (the Restructuring Act) and the Department's Order in D.T.E. 98-84A, Massachusetts electric Company, are exempt from the requirements of G.L. c. 164, § 69I. New England Power Company d/b/a National Grid, 20 DOMSB 129, EFSB 13-2/D.P.U. 13-151/13-152, at 6 n.4 (2014) ("NEP Salem"); New England Power Company d/b/a National Grid, 20 DOMSB 1, EFSB 12-1/D.P.U. 12-46/12-47, at 5 n.1 (2014) ("NEP IRP"); New England Power Company d/b/a National Grid and Western Massachusetts Electric Company, 18 DOMSB 323, EFSB 10-1/D.P.U. 10-107/10-108, at 5 n.2 (2012) ("Hampden County"); Lower SEMA at 4 n.4; Order Exempting Electric Companies From Any and All of the Provisions of G.L. c. 164, § 69I, D.T.E. 98-84/EFSB 98-5, at 5 (2003). Thus, the Siting Board no longer considers whether the proposed transmission facilities are consistent with a recently approved long-range forecast. Id.

transmission and distribution system meets these reliability criteria over time under normal conditions and under reasonable contingencies, given existing and projected loads; and (4) determines whether acceleration of conservation and load management programs, and pursuant to Chapter 249 of the Acts of 2004, the use of other alternatives to the facility, including other methods of transmitting or storing energy, might eliminate or slow the need for such additional energy resources.[22] Eversource Mystic-East Eagle at 9; Eversource Walpole-Holbrook at 7; Eversource Mystic-Woburn at 7; Lower SEMA at 4.

When a petitioner's analysis of system reliability and facility requirements is driven, at least in part, by load projections, the Siting Board reviews the underlying load forecast. Eversource Mystic-East Eagle at 9; Eversource Walpole-Holbrook at 7-8; Eversource Mystic-Woburn at 7; Lower SEMA at 5. The Siting Board requires that forecasts be based on substantially accurate historical information and reasonable statistical projection methods that include an adequate consideration of conservation and load management. G.L. c. 164, § 69J; Eversource Mystic-East Eagle at 9; Eversource Walpole-Holbrook at 8; Eversource Mystic-Woburn at 7; Lower SEMA at 5. To ensure that this standard has been met, the Siting Board requires that forecasts be reviewable, appropriate and reliable. Eversource Mystic-East Eagle at 9; Eversource Walpole-Holbrook at 8; Eversource Mystic-Woburn at 7; Lower SEMA at 5. A forecast is reviewable if it contains enough information to allow a full understanding of the forecast method; a forecast is appropriate if the method used to produce the forecast is technically suitable to the size and nature of the company to which it applies; and a forecast is considered reliable if its data, assumptions and judgments

[22] Pursuant to Chapter 249 of the Acts of 2004, applicants proposing a new transmission line are required to provide ". . . (3) a description of alternatives to the facility, such as other methods of transmitting or storing energy . . . or a reduction of requirements through load management . . . ." In addition, applicants are required to demonstrate that "projections of the demand for electric power. . . include an adequate consideration of conservation and load management." G.L. c. 164, § 69J.

provide a measure of confidence in what is most likely to occur. Eversource Mystic-East Eagle at 9; Eversource Walpole-Holbrook at 8; Eversource Mystic-Woburn at 7; Lower SEMA at 5.

2. The Project Is Needed to Maintain Transmission Reliability in Greater Boston and Northeastern Massachusetts.

As a transmission provider, Eversource must maintain its system consistent with the reliability standards and criteria developed by: (1) the North American Electric Reliability Corporation ("NERC"), which sets the minimum standards for electric power transmission for all of North America; (2) the Northeast Power Coordinating Council, Inc. ("NPCC"); and (3) ISO-NE. Exhs. EV-2, at 2-1; EV-EL-1, at 5-6. Federal and regional planning guidelines issued by these entities require that utilities ensure that their electric transmission systems can reliably deliver power where it is needed under stressed conditions that may include high demand on the power system, generator unavailability, and outages of transmission system elements. Exh. EV-2, at 2-1, 2-10. The Greater Boston Area transmission system has been under extensive study by the Working Group since 2008. Exhs. EV-2, at 1-3; EV-2, Appendix 2-1, at 2. The Updated Needs Assessment compared Greater Boston Area transmission performance against transmission reliability standards for the projected 2018 and 2023 system conditions. Exh. EV-2, at 2-8. In addition to the process conducted by the Working Group to evaluate the need for the Project, Eversource conducted its own analysis using the 2016 Capacity, Energy, Loads and Transmission ("CELT") report, including updated forecasts for energy efficiency and solar photovoltaics ("PV"), in order to confirm whether the need was still present. Exh. EV-2, at 2-2, 2-15. This comprehensive study process by the Working Group and, more recently, by Eversource, revealed a clear and immediate need for the Project to resolve the identified transmission system reliability issues. Exh. EV-2, at 1-4, 2-2. Addressing these issues is not discretionary for the Company; it is a requirement imposed on the Company by ISO-NE and NERC. Exhs. EV-2, at 1-4; PROTECT-

2-1. The Siting Board has previously accorded considerable weight to the ISO-NE Updated Needs Assessment for the Greater Boston area and its findings. Eversource Mystic-East Eagle at 26.

The Project is needed to address identified overloads on certain existing 69- and 115-kV lines serving the Marlborough Subarea of Subarea D that cannot be resolved or mitigated by re-dispatching generation or through other operator action. Exh. EV-2, at 1-4, 2-1, 2-2.[23] These overloads can occur at pre-2013 and projected load levels under various generation dispatch conditions, and various operating contingencies. Exh. EV-2, at 1-4. The Project will resolve potential thermal overloads and low voltage situations on the transmission system that, if left unaddressed, would otherwise leave the system at risk for voltage collapse that could lead to the loss of more than 400 MW of load, which translates to the loss of electric service to approximately 80,000 customers in the Marlborough Subarea. Exhs. EV-2, at 1-4, 2-2; EV-EL-1, at 8. Thus, there is an immediate and substantial need to address existing reliability issues in the Marlborough Subarea. Exh. EV-2, at 2-2.

The Marlborough Subarea is fed from the southeast by Line 455-507 originating from Eversource's Sherborn Substation, and from the west by the 115-kV Line E-157W originating from the Millbury Substation, owned by New England Power Company d/b/a National Grid ("NEP"). Exh. EV-2, at 2-2, Fig. 2-1. The 69-kV feeds to the area consist of NEP Line X-24W between Millbury Substation and Westborough Substation, Line N-40 from NEP's Pratts Junction Substation to NEP's Fitch Road Substation (where it becomes Line W-23 to NEP's Marlborough

[23] Subarea D is the area northwest of downtown Boston and includes the Sudbury, Marlborough and Northborough areas. Exh. EV-2, at 1-3. These areas include the municipalities of Sudbury, Framingham, Sherborn, Marlborough, Northborough, Westborough, Grafton, Hudson, Stow, Shrewsbury, Berlin, Millbury and Southborough. Exh. EV-2, at 1-3. Due to the geographic size and extensive identified transmission reliability needs, Subarea D was divided into two subareas: (1) the Sudbury Subarea; and (2) the Marlborough Subarea. Exh. EV-2, at 1-3. The Project will address ISO-NE's determination of a need for additional transmission capacity within the Marlborough Subarea of Subarea D, which encompasses the municipalities of Berlin, Framingham, Grafton, Hudson, Marlborough, Northborough, Shrewsbury, Stow, Southborough and Westborough. Exh. EV-2, at 1-3, 1-4.

Substation), and Line M-39 between NEP's Wachusett Substation to NEP's Fitch Road Substation. Exh. EV-2, at 2-2, Fig. 2-1. The towns of Hudson and Stow are served by HLPD, which owns Hudson Substation. Exh. EV-2, at 2-3, Fig. 2-1. Hudson Substation is presently fed by two 115-kV lines from NEP's Northborough Road Substation. Exh. EV-2, at 2-3, Fig. 2-1.

The Updated Needs Assessment studied 37 peak load cases with various transfer levels and generation dispatch conditions. Exhs. EV-2, at 2-9; EV-2, Appendix 2-1, at 28; EFSB-N-6.[24] The cases were identified as either design cases or retirement sensitivity cases. Exh. EV-2, at 2-10.[25] Thirty-four design cases and three retirement sensitivity cases were assessed by the Working Group for each of the years 2018 and 2023. Exh. EFSB-N-6. Design cases include cases that assume one major generating unit is out of service, as well as cases that assume two major units are out of service. Exh. EV-2, at 2-10. A thermal overload or high/low voltage condition in any design case constitutes a need that must be addressed by a proposed solution such as the Project. Exh. EV-2, at 2-10.

With regard to the Marlborough Subarea, the Updated Needs Assessment identified multiple single-contingency (N-1) and single contingency followed by a second contingency (N-

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[24] The 37 generation dispatch cases are organized by surrounding interface transfer levels. Exh. EV-2, at 2-9. One set is based on high transfers from northern New England to southern New England ("North-South transfers") along with high South Eastern Massachusetts/Rhode Island ("SEMA/RI") export levels; the second set is based on high North-South transfers with low SEMA/RI export levels; and the final set is based on low North-South transfers with high SEMA/RI export levels. Exhs. EV-2, at 2-9, 2-10; EFSB-N-3.

[25] Sensitivity testing was performed to address concerns that older generating units in the Boston Regional System Plan ("RSP") Subarea could retire from service or be subject to extended shutdown (for example, for repair or repowering) during the 10-year planning horizon. Exh. EV-2, at 2-10. The sensitivity cases all assumed the retirement of the 1975 vintage 578 MW Mystic 7 unit. Exh. EV-2, at 2-10. Study cases included two major units (Mystic 8 and Mystic 9) out of service with relevant interface transfer levels within their respective defined limits. Exh. EV-2, at 2-10. There is no requirement that a proposed solution be developed for a generator sensitivity case; however, the retirement sensitivity cases are used to examine the robustness of a proposed solution in light of potential future generator retirements. Exh. EV-2, at 2-10.

1-1)[26] overloads on several 115-kV and 69-kV lines under design case conditions that cannot be resolved or mitigated by re-dispatching generation or through other operator actions. Exh EV-2, at 2-7, 2-11.[27] Specifically, the Updated Needs Assessment identified potential overloads (with respect to the short-time emergency ("STE") and long-time emergency ("LTE") ratings) on Eversource Lines 455-507 and 513-507 and NEP Lines E-157W, E-157, E-157E, W-23, W-23W, N-40, X-24W and X-24E, in the event of N-1 and N-1-1 contingencies, under the various system operating conditions tested, including current and forecasted system load levels. Exh. EV-2, at 2-11. Although the N-1 contingency overloads are currently being addressed by NEP, the potential for thermal overloads under N-1-1 contingencies remain and must be addressed. Exh. EV-2, at 2-11. Indeed, post-contingency thermal overloads occurred in all 34 design cases and all three retirement sensitivity cases, which would be addressed by the Project and not by any other of the transmission projects recommended in the ISO-NE Solutions Study. Exh. EFSB-N-6. In addition, the potential for low voltage was also identified on many of the 69-kV buses in the area. Exh. EV-2, at 2-13, 2-14, Table 2-4.[28] Under certain contingencies in the Marlborough Subarea, voltages

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[26] As part of the Updated Needs Assessment, the ISO-NE Working Group used load flow analysis to assess the performance of the area transmission system under a series of defined contingency situations, including the following single contingencies (N-1): (1) loss of one transmission circuit, transformer, generator, bus section or shunt device; (2) opening of a line section without a fault; (3) loss of two transmission components (circuit, transformer or generator) sharing a common circuit breaker; and (4) loss of two transmission circuits on a multiple circuit transmission tower. Exh. EV-2, at 2-7. An N-1-1 contingency is defined as a loss of one major generating unit, transmission circuit or transformer followed by an N-1 contingency, as defined above. Exh. EV-2, at 2-7.

[27] The identified N-1 contingency overloads are being addressed as separate projects by NEP (the W-23W Reconductoring Project and the X-24W/E-157W DCT Project), which NEP planned to have completed in 2017. Exh. EV-2, at 2-11.

[28] Voltages at substations are typically required to be maintained between 0.95 per unit ("p.u.") and 1.05 p.u. Exh. EV-2, at 2-13. Voltage collapse is defined in the ISO-NE Transmission Planning Guide (the "Guide") as the "situation which results in a progressive decrease of voltage to unacceptable low levels, levels at which power transfers become infeasible." Exh. EV-2, at 2-13. The Guide further states that "[v]oltage collapse usually leads to a black-out." Exh. EV-2, at 2-13.

well below 0.95per unit would occur, indicating a significant risk of voltage collapse that would result in over 400 MW of load lost in 2023. Exh. EV-2, at 2-13.

To confirm the need for the Project as identified in the Updated Needs Assessment, the Company conducted additional analysis for the year 2023 using the 2016 CELT Report, including the updated energy efficiency and solar PV forecast ("Eversource Updated Analysis"). Exh. EV-2, at 2-14, 2-15.[29] The 2016 CELT Report included the results of Forward Capacity Auction ("FCA") #10, which covers the capacity commitment period for 2019-2020. Exh. EV-2, at 2-15. The 2016 CELT Report also incorporated some changes in generation and associated impacts to Subarea D; however, the changes were insignificant and did not affect the need for the Project. Exh. EV-2, at 2-16, 2-17, Table 2-7 and Table 2-8. The Eversource Updated Analysis verified that the Project is still needed to resolve the line overloads, low voltage and voltage collapse issues that were identified in the Updated Needs Assessment. Exh. EV-2, at 2-14, 2-15.

The Eversource Updated Analysis was conducted with all the other Greater Boston – New Hampshire Solution Projects in service except for the Project. Exhs. EV-2, at 2-17; EV-EL-1, at 9. The remaining N-1-1 overloads are shown in the table below.

[29] For purposes of the Eversource Updated Analysis, the Company assumed 18.4 MW of energy efficiency, 48.3 MW of passive demand response, 4.4 MW of active demand response and 18.4 MW of solar PV in the Marlborough Subarea, based on the 2016 CELT Report from ISO-NE. Exh. EFSB-N-2.

**Summary of 2016 CELT Cases Thermal Overloads**

| Subarea D Reference/Line # | 2023 |
|---|---|
| (D-2) E-157W Millbury to Centech | N-1-1 LTE overloads > 105% |
| (D-1) W-23 Fitch Road to Woodside | N-1-1 LTE overloads > 146%<br>N-1-1 STE overloads > 138% |
| (D-3) W-23W Northborough Road - Woodside | N-1-1 LTE overloads > 132%<br>N-1-1 STE overloads > 128% |
| (D-4) X-24W Millbury to Westborough | N-1-1 LTE overloads > 170%<br>N-1-1 STE overloads > 164% |
| (D-4) X-24E Westborough to Northborough Road | N-1-1 LTE overloads > 121%<br>N-1-1 STE overloads > 115% |

Exh. EV-2, at 2-18, Table 2-9.

On February 10, 2017, changes to ISO-NE's Planning Procedure 3 ("PP-3"), now called "Reliability Standards for the New England Area Pool Transmission Facilities," became effective. Exh. EFSB-N-13. The changes to PP-3 include an exemption for Double Circuit Tower ("DCTs") contingencies for N-1 testing if the DCTs are used only for station entrance and exit purposes and if they do not exceed five towers at each station and the total length of the DCT arrangement is less than one mile. Id. Also, for N-1-1 testing, DCTs and stuck breaker contingencies are not evaluated as a second contingency under PP-3; however, they are evaluated for their impact on NPCC defined Bulk Power System elements. Id. Notably, the contingencies that cause the voltage collapse and overloads on the 69-kV and 115-kV circuits include N-1-1 contingency pairs involving the loss of individual transmission circuits that are unaffected by the PP-3 changes. Id. Therefore, even with the application of the new PP-3 changes, line overloads remain for multiple lines, with many of the lines still over their STE ratings. Exhs. EFSB-N-13; RR-EFSB-16.

The Eversource Updated Analysis also confirmed the low voltage issues in the Marlborough Subarea identified in the Updated Needs Assessment remained. Exh. EV-2, at 2-18. A summary of the 2016 CELT cases low voltage results is provided in the table below.

**Summary of 2016 CELT Cases Low Voltage Results (per unit)**

| Substation Name, Location | 2023 |
|---|---|
| Woodside, Northborough | 0.80 |
| Northborough Road (69kV), Southborough | 0.77 |
| Northborough Road (115kV), Southborough | 0.75 |
| MWRA, Southborough | 0.78 |
| North Grafton, Grafton | 0.86 |
| Westborough, Westborough | 0.80 |
| West Framingham, Framingham | 0.75 |
| Hudson, Hudson | 0.74 |
| East Main St., Westborough | 0.78 |
| North Marlboro, Marlborough | 0.75 |
| South Marlboro, Marlborough | 0.76 |
| Marlboro, Marlborough | 0.76 |

Exh. EV-2, at 2-18, Table 2-10.

In addition, the Eversource Updated Analysis demonstrated that, without the Project, based on forecasted extreme summer peak loads at the stations serving the municipalities affected by the voltage collapse based on the 2016 CELT Report, minus the EE forecast, PV forecast and passive demand response, an N-1-1 event resulting in voltage collapse would result in loss of service to the area served from the following substations listed in the table below.

**Forecasted Summer Peak Loads (MW) based on 2016 CELT (minus EE forecast, passive DR and PV forecast)**

| Station, Location | 2023 (MW)[30] |
|---|---|
| West Framingham, Framingham | 49.80 |
| Northborough Road, Southborough | 41.53 |
| South Marlboro, Marlborough | 26.98 |
| Marlboro, Marlborough | 59.98 |
| North Marlboro, Marlborough | 25.33 |
| Hudson, Hudson | 63.06 |
| East Main Street, Westborough | 32.47 |
| Westborough, Westborough | 50.53 |
| North Grafton, Grafton[31] | -0.36 |
| Woodside, Northborough | 29.02 |
| Centech, Shrewsbury | 16.88 |
| **Total** | **395.22** |

Exh. EV-2, at 2-19, Table 2-11; PROTECT-2-69(1). The loss of load could potentially disconnect more than 400 MW of load in 2023. Exh. PROTECT-2-69(1). Such an outage could affect approximately 80,000 customers in the Marlborough Subarea. Exh. EV-2, at 2-18.

Lastly, the Updated Needs Assessment included a determination of the year of need for each transmission element that was found to be exposed to potential overloads under contingency conditions. Exh. EV-2, at 2-15. The year-of-need assessment was based on the Boston Regional System Plan ("RSP") Subarea loads and on evaluation of the year and load level at which elements first fail to meet criteria under N-1 and N-1-1 contingency conditions. Exh. EV-2, at 2-15. The assessment found that the lines addressed by the Project first fail to meet reliability requirements

30 In the Company's Initial Petition, active demand response was inadvertently subtracted out of Table 2-11. Exhs. EV-2, at 2-19, Table 2-11; PROTECT-1(S1). As demand response is an operating activity controlled by ISO-NE, it is not typically subtracted out of the load loss for a load pocket or a voltage collapse situation. Exh. PROTECT-1(S1). Active demand response was included in the load flow analyses, such as the 2015 Updated Needs Assessment and the Eversource Updated Analysis, performed to determine thermal overloads and voltage violations. Exh. RR-EFSB-6.

31 In the Company's Initial Petition, the North Grafton load was incorrectly listed as 29 MW. Exh. PROTECT-1(S1). NEP has a project to convert the station and add approximately 17 MW of load to it in the 2019 time frame. Exh. PROTECT-1(S1). However, the Company used 0.11 MW of load to reflect the current load at the substation. Exh. PROTECT-1(S1).

under N-1-1 conditions prior to 2013. Exh. EV-2, at 2-15. With respect to the year of need for the voltage violations identified in the Marlborough Subarea, based on the analyses showing post-contingency voltages that are approximately 25 percent below acceptable levels in 2018, it can be concluded that the year of need is 2017 at the latest. Exh. EFSB-N-9. Thus, the Updated Needs Assessment and the Company's analysis demonstrate that there is an immediate need for transmission system upgrades in the Marlborough Subarea in order to continue to reliably serve customers. Exhs. EV-2, at 2-15; EFSB-N-9.

During the proceedings, the Company was asked to update its assessment of the need for the Project based on the 2017 CELT 90/10 forecast. Exh. SUD-N-3. The loads to be compared are the loads in the Boston RSP Subarea as they are the most applicable to the Needs Assessment. Exh. SUD-N-2. The load level used for the Boston RSP subarea in Updated Needs Assessment was slightly below the value in the 2017 CELT Report for 2023. Exh. SUD-N-3. Although the 2017 CELT Report forecast a 0.5% decrease in gross load from the 2016 CELT Report forecast, the 90/10 forecast for the Boston RSP Subarea is higher in the 2017 CELT than the actual peak load for 2011 and 2013. Exhs. SUD-N-2; PROTECT-2-75. Accordingly, the needs in Subarea D are not affected by the 2017 CELT Report forecast because the facilities in Subarea D are overloaded for load levels that have already been experienced in the Greater Boston RSP Subarea. Exhs. PROTECT-2-75, PROTECT-2-85. Furthermore, the level of loading for the facilities in Subarea D far exceeds the 15-minute emergency ratings for these facilities. Therefore, the 2017 CELT Report further supports the need for system upgrades to address immediate concerns in this area. Exh. PROTECT-2-85.

3. Conclusion on Need

In sum, the existing 69-kV and 115-kV transmission infrastructure in the Marlborough Subarea of Subarea D is inadequate to reliably serve current and future loads in the area. Exh. EV-

2, at 2-19. The need for the Project, as demonstrated by the Updated Needs Assessment and the Eversource Updated Analysis, is immediate because the potential for low voltage, voltage collapse and thermal overloads occur at pre-2013 load levels as well as at currently forecasted peak loads. Exh. EV-2, at 2-19. Based upon the foregoing, the Company has demonstrated that the Project is necessary to meet the identified system needs. Therefore, in accordance with precedent, the Siting Board should find that the Project is needed.

### B. The Company Evaluated a Reasonable Range of Possible Project Alternatives in Determining That the Project Was Superior in Meeting the Identified Need.

#### 1. Standard of Review

The Siting Board is required to evaluate proposed projects to ensure a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. See G.L. c. 164, § 69H. In addition, Section 69J requires a proposed project proponent to present alternatives to the proposed facility, which may include: (a) other methods of transmitting or storing energy; (b) other sources of electrical power or natural gas; or (c) a reduction of requirements through load management. Eversource Mystic-East Eagle at 29; Eversource Walpole-Holbrook at 17; Eversource Mystic-Woburn at 18.

In implementing its statutory mandate, the Siting Board requires a petitioner to show that, on balance, its proposed project is superior to alternative approaches in terms of reliability, cost, environmental impact and ability to meet a previously identified need. Eversource Mystic-East Eagle at 29; Eversource Walpole-Holbrook at 17; Eversource Mystic-Woburn at 18; Lower SEMA at 29. In addition, the Siting Board requires a petitioner to consider reliability of supply as part of its showing that the proposed project is superior to alternative project approaches. Id.

2. Evaluation of Project Alternatives

The Company comprehensively identified and analyzed various alternatives to address the identified need for the Project. In order to determine the approach that best balances reliability, cost and environmental impact, and consistent with Section 69J and Siting Board precedent, the Company evaluated a series of project approach alternatives for their potential to meet the need identified in the Project Area. Exh. EV-2, at 3-1 to 3-13. The evaluation process involved three distinct assessments: (1) a No-Build Alternative; (2) two transmission alternatives and (3) NTAs, including incremental energy efficiency, demand response, energy storage and new generation (including solar and fossil-fueled sources). Id. Through this analysis, the Company demonstrated that the Project is the alternative that best meets the identified need, with a minimum impact on the environment, at the lowest possible cost. Id.

a. No-Build Alternative

Under the No-Build Alternative, no improvements would be made to the existing electric supply system serving Eversource, NEP and municipal customers in the Marlborough Subarea to address the identified needs. Exh. EV-2, at 3-2. Under this alternative, the Company would not pursue any new facilities or resources to address the area deficiencies, but instead would continue to rely upon the existing system configuration. Id. This approach was dismissed from further consideration because it would not address the identified transmission reliability needs, which exist at current load levels; it would not correct the violations of national (NERC) and regional (NPCC and ISO-NE) reliability standards; and the region would continue to be at risk for voltage collapse resulting in loss of more than 400 MW of load. Id.

b. Transmission Alternatives

The ISO-NE-led Working Group evaluated two transmission alternatives to address the needs in the Marlborough Subarea identified as part of the Greater Boston Solution Study: (1) the

proposed Project (Transmission Alternative #1); and (2) a set of projects that would be undertaken by NEP and referred to as the "NEP Alternative" (Transmission Alternative #2). Exh. EV-2, at 3-2. Ultimately, ISO-NE selected the Project as the preferred solution to address the needs. Exh. EV-2, at 3-1; EV-2, Appendix 3-3, at 63, 107. As discussed below, the Company's additional comparative analysis further demonstrated that the proposed Project, including the improvements at Hudson Substation,[32] is superior to the NEP Alternative. Exh. EV-2, at 3-2.

The NEP Alternative is a set of projects that consists of the following components:

(1) Converting NEP Line X-24 from 69-kV to 115-kV from NEP's Millbury #5 Substation in Millbury, to NEP's Northborough Road Substation in Southborough (14.5 miles);

(2) Reconductoring the 115-kV Line 455-507 from Eversource's West Framingham Substation to Eversource's Sherborn Substation (5.75 miles; and including upgrades to West Framingham Substation and Sherborn Substation); and

(3) Reconductoring NEP's 115-kV Line E-157W from NEP's Millbury #2 Substation to Shrewsbury Electric and Cable Operations' ("SELCO") Centech Substation (5.8 miles).[33]

Exhs. EV-2, at 3-3; EV-2, Appendix 3-4; EFSB-PA-4.

To complete the voltage conversion of the NEP Line X-24 from 69-kV to 115-kV, some existing 69-kV equipment at five substations would need to be upgraded to 115-kV as follows:

(1) Millbury #2 Substation (115-kV) – Relocate the existing V-174 Line and add a position for the X-24 Line, which would now terminate at Millbury #2;

(2) Millbury #5 Substation – Remove the 69-kV X-24 Line and change the relay settings;

(3) North Grafton Substation – Redesign the substation for 115-kV;

(4) Westborough Substation – Upgrade all 69-kV equipment to 115-kV; and

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[32] Although the Hudson Substation upgrades are not part of the Project for which the Company is seeking approval, the work is a component of the Transmission Alternative 1 solution.

[33] Line X-24 and Line E-157W are collocated within the same ROW for approximately 2.8 miles between the Centech Substation and Millbury Substations.

(5) Northborough Road Substation – Expand the existing 115-kV yard and relocate Line X-24 to it.

Exh. EV-2, at 3-3, 3-4, Figure 3-2. The total conceptual level (-25%/+50%) cost estimate of the NEP Alternative is approximately $116 million.[34,35] Exhs. EV-2, at 3-4; RR-EFSB-17.

The Company conducted a comparison of the reliability, costs and environmental impacts of the Project and the NEP Alternative. Exh. EV-2, at 3-4 to 3-7. With respect to reliability, both the Project and the NEP Alternative would meet the identified need. Exh. EV-2, at 3-4. However, the Project is superior to the NEP Alternative in its ability to bring greater reliability to the Marlborough Subarea. Exh. EV-2, at 3-5. This is because the Project provides an important local reliability benefit to the towns of Hudson and Stow. Exh. EV-2, at 3-4, 3-5. The local reliability benefit to the towns of Hudson and Stow stems from the fact that the Project would bring a third, geographically separate transmission line into Hudson Substation, thereby allowing the Hudson Substation to remain in service following the loss of a DCT (N-1 contingency) carrying the two existing transmission lines between the Northborough Road Substation and the Hudson Substation. Exhs. EV-2, at 3-4, 3-5; RR-EFSB-17.[36] In addition, the Project provides a new transmission source into the area on a new ROW, further diversifying the supply for the Marlborough Subarea and preventing the loss of two of the 115-kV sources of supply into the area under the extreme

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34 NEP provided the cost estimates for its respective portion of the NEP Alternative. Exh. EFSB-PA-22.

35 The overall cost estimate for the NEP Alternative includes an estimate of approximately $103.1 million for the NEP components of the alternative and approximately $13.0 million for the Eversource components of the alternative (reconductoring the 115-kV Line 455-507 from West Framingham Substation to Sherborn Substation and upgrading those stations). Exh. EV-2, at 3-4.

36 HLPD, the Town of Hudson's municipal electric department, serves approximately 27,000 people in the towns of Hudson and Stow. Exh. EV-2, at 3-4. HLPD's Hudson Substation is currently served by two radial transmission lines on common towers. Exh. EV-2, at 3-4. The proposed reconfiguration to a ring bus design at Hudson Substation, with alternating transmission line and load power transformers, would provide additional reliability to the Hudson Substation as compared to the existing radial system. Exh. EV-2, at 3-5. This benefit is unique to the Project because, under the NEP Alternative, the existing radial system would remain in place. Exh. EV-2, at 3-5.

contingency of loss of all lines within a ROW. Exh. EV-2, at 3-5. By contrast, the Company is not aware of any reliability benefits that would be provided by the NEP Alternative that would not be provided by the Project. Exh. EFSB-PA-2.[37] Accordingly, the Project is superior to the NEP Alternative from a reliability perspective.[38,39]

The Project is likewise superior to the NEP Alternative from a cost perspective. Indeed, the total estimated cost of the Project is approximately $96 million (-25%/+25%) and the total estimated cost of the NEP Alternative is $116 million (-25%/+50%). Exhs. EV-2, at 3-4; RR-EFSB-17; RR-EFSB-50; RR-EFSB-50(1). In addition to being the lower cost alternative, the Project also provides an important community and financial benefit to the Commonwealth and local municipalities through the Company's partnership with DCR that will advance the proposed MCRT, saving Commonwealth funds to construct the multi-use trail. Exh. EV-2, at 3-4.

Regarding relative environmental impacts, the Project is approximately 9.0 miles in length, with upgrades at two existing substation facilities, while the NEP Alternative would involve 26.1 miles of transmission line work, including the replacement of approximately 233 structures, as well as proposed upgrades at five substations. Exhs. EV-2, at 3-3 to 3-5, Fig. 3-2; EV-2, Appendix 3-4; EFSB-PA-5(R-1); EFSB-PA-9; EFSB-PA-28; Attachment EFSB-PA-28(1); EFSB-PA-

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37 In the Company's Initial Petition, the Company's analysis at the time indicated that the NEP Alternative would adversely affect the backup supply to SELCO; however, due to recent changes in the SELCO electric system, the NEP Alternative would not adversely affect the backup supply to SELCO. Exh. EFSB-PA-3.

38 The Project would also provide a somewhat greater capacity increase to the area than the NEP Alternative. Exh. EFSB-PA-29. The capacity increase provided by the Project is approximately 320 megavolt ampere ("MVA") as compared to approximately 300 MVA by the NEP Alternative. Exh. EFSB-PA-29. All else equal, the greater increase in capacity created by the Project is preferable to the NEP Alternative because, in the long term, having the extra capacity may provide reliability benefits like preventing other stations nearby from becoming overloaded. Exh. EFSB-PA-29. In addition, whereas nearly the entire Project can be built without planned outages to existing elements, the NEP Alternative would require longer duration outages associated with, for example, the Line X and the reconductoring of Lines 455-507 and E-157W. Exh. RR-EFSB-17.

39 In Eversource Mystic-East Eagle, it was noted that all else equal, the Siting Board views a solution that provides a larger increase in capacity as a more robust and flexible alternative. EFSB 14-04/D.P.U. 14-153/14-154 at 60.

36(S1); EFSB-PA-36(R-3). Overall, the transmission line and substation work for the Project is much less substantial and complex than what would be required for the NEP Alternative. Exh. RR-EFSB-17. The table below presents a comparative analysis of the key environmental elements for both the Project and the NEP Alternative.

**Transmission Alternatives Potential Environmental Impact Comparison Summary**

| | **The Project** | **NEP Alternative** |
|---|---|---|
| Municipalities | Sudbury, Marlborough, Stow, Hudson | Millbury, Grafton, Shrewsbury, Westborough, Southborough, Framingham, Ashland, Sherborn |
| Total Circuit Miles[40] | 9.01 | 26.1 |
| Total ROW Miles | 9.01 | 26.1 |
| Number Highway/Road Crossings | 10 | 66 |
| Residential (total parcels adjacent to ROW limits) | 156 | 290 |
| Number of Water Body Crossings | 11 | 41 |
| Permanent Fill Within Vegetated Wetland Areas | 4,410 s.f. (0.10 acres) | 6,096 s.f. (0.14 acres) |
| Temporary Fill Within Vegetated Wetland Areas | 0 s.f. (0 acres) | 1,101,974 s.f. (25.3 acres) |
| Tree Clearing Within Forested Wetland Areas | 7,370 s.f. (0.17 acres) | 0 s.f. (0 acres) |
| Proposed Disturbance Within NHESP Priority/Estimated Habitat in ROW (acres) | 4.54 | 1.45 |
| Proposed Disturbance Within an Area of Critical Environmental Concern in ROW (acres) | 0 | 1.18 |
| Proposed Disturbance Within Vegetated Wetland Areas Classified as Outstanding Resource Water Areas | 8 s.f. | 188,615 s.f. (4.33 acres) |
| Proposed Total Tree Clearing | 1,217,930 s.f. (27.96 acres) | 6,000 s.f. (0.14 acres) |
| Existing Adjacent Conservation Land (miles) | 3.7 | 2.9 |
| Existing Mapped Cultural Resources (MHC Point) | 23 | 44 |
| Existing Mapped Cultural Resource (MHC Areas; miles) | 1.7 | 2.5 |
| Length Within Mapped Public Water Supply Areas | 6.49 miles | 2.4 miles |

Exhs. EV-2, at 37, Table 3-1; EFSB-PA-5(R-1); EFSB-PA-36(R-3), EFSB-PA-36(R-3)(1).

Given that the Project and the NEP Alternative each has its own distinct features and types of environmental impacts, direct comparisons and judgments on the relative merits from an environmental impact perspective is difficult. On the whole, based on the mix of impacts associated with the Project and the NEP Alternative, the Company concluded that the Project and

[40] Circuit miles are calculated using the entire length of the Project. Exh. RR-EFSB-9. ROW miles reflect the length of the Project in corridors that do not contain electrical infrastructure or require an upgrade to a new voltage. Exh. RR-EFSB-9.

the NEP Alternative are comparable to each other with regard to the potential for environmental impacts. Exh. EFSB-PA-36(R-3).

Based upon all of the considerations discussed above regarding the merits of the Project relative to the NEP Alternative from a reliability, cost and environmental impact perspective, the Siting Board should find that the Project is superior to the NEP Alternative.

c. Non-Transmission Alternatives

The Company engaged LEI to prepare an independent evaluation of the feasibility and cost of implementing NTAs in lieu of the Project. Exh. EV-2, at 3-8. LEI's assumptions, methodology and findings are detailed in a report titled, "Analysis of Non-Transmission Alternatives to the Sudbury-Hudson Project: Identification of Feasible NTA Technologies and Levelized Costs," dated January 11, 2017 (the "LEI Report"). Exh. EV-2, at 3-8, Appendix 3-5. As input to the LEI Report, the Company conducted an analysis to determine the amount of energy injection required (in terms of MW) and location of those energy requirements (new resources) to address thermal overloads in the Marlborough Subarea if construction of the Project were to be deferred. Exh. EV-2, at 3-8. Subsequently, based upon further information developed during the proceeding, the Company revised its analysis of the minimum NTA injection requirement to address the identified need for the Project and the locations where the injections would be required. Exhs. EFSB-RR-19; RR-EFSB-24(R1). At the request of the Siting Board, LEI provided an updated assessment of the potential costs of different NTA technologies that could address the Project need based on the updated injection requirement as well as the latest information available on the capital cost of technologies, market revenue expectations, and the Company's revenue requirement for the Project (the "Updated LEI Report"). Exhs. RR-EFSB-24(R1); RR-EFSB-24(R1)(1). As discussed below, both the initial LEI Report and the Updated LEI Report concluded that, while

technologically feasible NTA solutions[41] could meet the identified need, they would be unprecedented in scope, costly, and difficult to implement, particularly to achieve an in-service date comparable to that of the Project. Exhs. EV-2, at 3-12, Appendix 3-5; RR-EFSB-24(R1)(1).

i. Methodology for Evaluating NTAs

The amount of NTA resources necessary to address the identified need is based on the minimum injection requirement and technical requirements. Exh. RR-EFSB-19. Although the Company initially determined 264 MW to be the minimum injection requirement, based on further analysis of the Marlborough load pocket and applying updated ISO-NE planning criteria and the 2016 CELT forecast, the Company determined that the minimum injection requirement is 115 MW. This amount of injection could be at a single substation or distributed across several substations. Id.; Exhs. EV-2, at 3-9; EFSB-RR-19; Tr. 15, at 2535, 2554-2555.

Eversource also determined that any technically feasible NTA would need to provide firm capacity within 30 minutes after the first contingency event of an N-1-1 contingency and then continue to operate for at least 12 hours, in accordance with ISO-NE planning standards.[42] Exhs. RR-EFSB-19; Exh. RR-EFSB-24(R1)(1). The Company further determined that as a practical matter, in order to ensure a dependable supply and fully eliminate the need for the Project, the amount of NTA resources would need to be somewhat larger than the minimum injection amount assessed by LEI. Exh. RR-EFSB-19.

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41 A technically feasible NTA technology is defined as one that is independently capable of providing energy to meet the energy injection requirements, performance, and response time at a particular location. Exh. EV-2, at 3-10.

42 ISO-NE Planning Procedure Planning Procedure 7 requires that transmission elements have a 12-hour rating in the summer, or LTE rating, to provide the needed supply under various contingencies. Tr. 15, at 2538, 2559. Accordingly, to compare transmission and non-transmission alternatives on a consistent basis, and for NTAs to have the same level of reliability of supply, NTAs also need to provide firm capacity for at least 12 hours. Tr. 15, at 2559-2560.

Using the updated injection requirement, as well as the latest cost and revenue market data, LEI reassessed the technical feasibility and costs of various non-transmission technologies under two potential configurations – a "large-scale" NTA (an injection of 115 MW at a single location) and a "medium-scale" NTA (injections of approximately 30 to 50 MW at three locations). Exhs. RR-EFSB-24(R1); RR-EFSB-24(R1)(1); Tr. 15, at 2536. LEI generally followed the same methodological approach for the Updated LEI Report as was undertaken for the original LEI Report from January 2017. Exh. RR-EFSB-24(R1)(1); Tr. 15, at 2536.

In addition to the NTA technologies previously considered (such as conventional generation, energy efficiency, and solar), in the Updated LEI Report, LEI also considered reciprocating engines and a stand-alone energy storage solution. Exhs. RR-EFSB-24(R1); RR-EFSB-24(R1)(1); Tr. 15, at 2536.[43] As an initial step, LEI identified those NTA technologies, either independently or in combination, that could provide the size of injection required at a specific location, based on established minimum and maximum sizes for each technology and whether a specific technology has the operating characteristics (availability, expected generation profile, and response time) needed to respond to contingency conditions at a specific location. Exhs. EV-2, at 3-8, 3-10; RR-EFSB-24(R1)(1).

Although LEI also analyzed the possibility of incremental energy efficiency and active demand response as an NTA solution (these incremental load reduction initiatives would need to

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[43] The Company also considered the feasibility of grid modernization mechanisms, such as time varying rates ("TVR") to avoid or delay the need for the Project. Exh. EV-BJR-1, at 4. However, in the Company's experience, customer interest in TVR is low and difficult to sustain. Id.; Tr. 3, at 530-531, 535. Accordingly, customer response would result in a total peak demand reduction of less than 1% under expected participation rates. Exh. EV-BJR-1, at 4. In addition to other obstacles, implementation of a TVR rate design would require substantial investments in interval meters for participating customers, upgrades of data collection and billing systems, as well as customer outreach and education. Id. at 5. Therefore, the Company concluded that a TVR program would not have a very significant impact on peak demand within the local Marlborough Subarea. Tr. 3, at 535. It also bears noting that the Company's load represents approximately 12% of the total peak load in the Marlborough Subarea, and thus, the prospect of a TVR solution implemented by Eversource alone would not be able to produce the amount of peak load reduction necessary to satisfy the applicable reliability requirements. Exh. EFSB-RR-109.

go beyond the forecasted programs embedded in in the 2016 CELT Report load forecast, as those reductions were already accounted for in the Company's estimate of NTA injection requirements), LEI concluded that injection requirements at the selected substations exceed 15% of forecasted peak load at those substations, implying that, even if incremental energy efficiency could achieve 15% peak load reductions at those substation locations, which is unlikely at best, it would not be sufficient to resolve the contingency event.[44] Exh. EFSB-RR-24(R1)(1) at 6; Tr. 4, at 567; Tr. 15, at 2553, 2554. Further, energy efficiency measures are more expensive than other solutions, and thereby would drive costs up even in hybrid solutions.[45] Exh. RR-EFSB-24(R1)(1) at 6; Tr. 1, at 102; Tr. 15, at 2536, 2549. Accordingly, demand solutions like EE were eliminated from more detailed consideration as viable options. Tr. 15, at 2536.

Following the same methodological approach as had been used in the initial LEI Report, LEI then employed a levelized cost methodology to evaluate the direct costs to ratepayers of implementing NTA technologies. Exhs. EV-2, at 3-11 to 3-12; RR-EFSB-24(R1)(1) at 3-4. The direct costs were calculated by aggregating the total cost of implementing least-cost technically feasible NTA technologies for each location. Exh. RR-EFSB-24(R1)(1) at 3-4. LEI assessed the costs of technically feasible NTA solutions by evaluating the total costs of investment and fixed costs of operations (based on gross Levelized Cost of Entry per kW year). Id. Then, LEI considered the net costs of investment and operations that ratepayers would bear after accounting

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44 The Company has implemented energy efficiency programs to the best of its ability and to the extent of customers' willingness to participate. Tr. 4, at 587. Furthermore, targeted programs have had a low probability of success. Tr. 4, at 588.

45 LEI analyzed energy efficiency program costs and capacity costs savings produced by the Company's energy efficiency programs as reported in the 2016 energy efficiency plan report and determined that the net levelized cost is over $800 per kw per year, which is significantly more than supply-side NTAs. Tr. 15, at 2547-2548, 2658. Generally speaking, low cost energy efficiency alternatives have been already implemented; therefore, the average unit cost for incremental energy efficiency programs would be higher than existing program costs. Exh. EV-2, App. 5-3, at 11.

for possible market revenues and other income streams (for example, from other ratepayer-funded programs, like Renewable Energy Certificates ("RECs")). Id.

ii. Results of NTA Analysis

For the large-scale configuration, depending on expectations for future market revenues, LEI determined that the least-cost, technically feasible NTA technology would be a hybrid solution consisting of two 57 MW frame peaking gas turbines and one 18 MW reciprocating engine, which would have an annual levelized cost to consumers of between $13.7 and $20.4 million per year. Exhs. RR-EFSB-24(R1); RR-EFSB-24(R1)(1) at 1, 15. Assuming a constraint that at a given location, only one type of technology could be installed, three 57 MW frame peaking gas turbines could be installed, which would have an annual levelized cost to consumers ranging between $16.8 and $25.4 million per year. Id. For the medium-scale configuration, LEI determined that the least-cost, technically feasible NTA technology combination would be one 57 MW frame peaker at West Framingham Substation, one 57 MW frame peaker at North Marlboro Substation, and two 18 MW reciprocating engines at Northborough Road Substation, with a total annual levelized cost to consumers of between $16.3 and $23.9 million per year. Id. at 1, 19.

In comparison, the annual levelized carrying cost of the Project is $11.2 million over the life of the Project, which is lower than the cost of the least-cost NTA solution identified under both the large-scale and medium-scale cases, including the hybrid solution. Exhs. RR-EFSB-11(S1); RR-EFSB-24(R1). Furthermore, the Project is expected to have a useful life in excess of 40 years, while NTA technologies could require periodic refurbishment or replacement over a 40-year time frame, the costs of which would raise the overall life-cycle cost of these alternatives. Exh. RR-EFSB-24(R1).

LEI also thoroughly evaluated whether solar combined with energy storage or a stand-alone battery solution could provide a cost-effective and reliable non-transmission alternative. Exhs. EV-2, at 3-12; EV-JF-1; RR-EFSB-24(R1)(1) at 19-22. The Updated LEI Report conclusively shows that a solar PV resource, either utility scale or distributed generation, would be technically insufficient on its own and that solar combined with energy storage or a stand-alone battery solution would be significantly more expensive than either the proposed Project or an NTA solution based on conventional fossil-fueled generation.[46] Exh. RR-EFSB-24(R1)(1).

LEI detailed its methodology for determining the necessary size of a solar and battery solution in the Updated LEI Report. Exh. RR-EFSB-24(R1)(1) at 19-22. As described above for other NTA technologies, LEI first determined the size of the energy storage component of the solution, based on the NTA injection amount of 115 MW, and the fact that the critical load level ("CLL") analysis shows that an event that would trigger a reliability problem could occur in the evening or nighttime.[47] Id.; Tr. 15, at 2539. LEI determined that a stand-alone battery solution would cost $86.8 million/year (including charging costs) under both the medium-scale and large-scale case, because the total injection requirement under both cases (115 MW for 12 hours) would require the same storage capacity (i.e., 1,380 MWh). Exh. RR-EFSB-24(R1)(1) at 1.

LEI's calculation of the total net direct cost of the utility-scale solar PV plus battery solution assumes that the additional revenues from utility-scale solar PV are not used to fund the

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46 Because of the intermittency of their supply, stand-alone solar PV systems are not a technically feasible NTA solution. Exh. RR-EFSB-101.

47 Although LEI did not explicitly consider the replacement cost of NTA solutions, renewable resources like solar PV and battery systems typically have shorter life cycles than electric transmission lines, potentially requiring replacement of major components of PV and storage systems within 10-20 years. Exh. RR-EFSB-24(R1)(1) at 17. As such, over a 40-year time frame, these resources would require a significant capital cost outlay to maintain their performance. Id. The need for such additional capital cost outlays over the life cycle of these resources was not included in LEI's cost comparison. Id. This adds a substantial measure of conservatism (in favor of PV and battery systems) to LEI's analysis.

costs of the battery system (because those net revenues would typically be retained by the host customer and/or developer as compensation for their investment). Exhs. RR-EFSB-24(R1)(1); RR-EFSB-101. The assumption that revenues from solar PV would be used to defray the costs of the battery installation is unrealistic because those net revenues would be impractical to "clawback" from the host customer and/or project developer. Exh. RR-EFSB-101, at 3. It is not reasonable to believe that solar PV customers could be forced to invest in and install batteries to supplement the solar PV installations without being fully compensated for that costly battery investment. Id.

Nonetheless, even if one assumes, as the Town of Sudbury has, that revenues from the solar PV would be used to defray the cost of the battery installation for the utility-scale solar PV plus battery solution, LEI calculated that the net direct cost to consumers would range between $19.4 and $22.3 million per year.[48] Exh. RR-EFSB-101. Therefore, even under the most optimistic set of assumptions, both a stand-alone battery storage solution and a utility-scale solar PV and battery solution would be more expensive than the least-cost technically feasible solutions identified by LEI under the large-scale, hybrid and medium-scale solutions using reciprocating engines and peakers (between $13.7 and $20.4 million per year). Exhs. RR-EFSB-24(R1); RR-EFSB-24(R1)(1); RR-EFSB-101. Moreover, the net direct cost to ratepayers for a solar PV solution is almost eight times higher than the respective cost estimate for the Project, which is approximately $11.2 million per year. Exhs. RR-EFSB-11(S1).

[48] The Company also reviewed the legal and operational requirements for revenues to be earned by a DG-based solar PV plus battery NTA, as proposed by the Town of Sudbury, but concluded that the Town of Sudbury's assumptions regarding revenues are not realistic and that, accordingly, such an NTA solution would be even more expensive and not provide a reliable backstop to the contingency need. Exh. RR-EFSB-101.

iii. Constraints on Implementation of NTAs

In addition to the increased cost of a technically feasible NTA solution compared to the Project, LEI also considered a number of practical limitations to developing NTAs at the specified locations and determined that implementation of an NTA solution would likely be infeasible due to a myriad of practical challenges, including land requirements, zoning/permitting implications, lack of enabling infrastructure, unprecedented penetration rates, development time, replacement costs, and operational considerations. Exhs. EV-2, at 3-8, 3-10 to 3-11; RR-EFSB-24(R1); RR-EFSB-24(R1)(1) at 16-17.

Installation of three large-frame gas turbines under the large-scale solution would require at least four acres of land to accommodate the turbine-generator sets, fuel storage (if the turbines are required to be dual-fuel) and ancillary facilities. Exh. RR-EFSB-24(R1). For the medium-scale solution, the land requirements would be at least 1.4 acres at West Framingham Substation and 2.5 acres at North Marlboro Substation. Id. Finding this amount of clear, suitable land at or around these substation locations would be challenging given that these areas are densely populated and prohibitively expensive. Exh. RR-EFSB-24(R1)(1) at 16.

Furthermore, the least-cost NTA solutions under both cases would require a gas pipeline interconnection. Exh. RR-EFSB-24(R1)(1) at 16. Gas supply at sufficient volumes and pressures would not be available at North Marlborough Substation, and the substation itself would require significant expansion to interconnect any generation of sufficient size. Id. Peaker frame units and reciprocating engines would also need to interconnect at the respective substations, which would require substantial upgrades to those substations to include additional terminal positions, resulting in additional costs. Id. In addition, expansion of the substation footprint would also entail additional zoning-related restrictions. Id.; Exh. RR-EFSB-24(R1).

Were an NTA solution based on distributed resources to be implemented, it would require significant operational intervention and infrastructure investments. Exhs. RR-EFSB-19, RR-EFSB-101, at 7. In order to participate in the ISO-NE markets, each registered asset must have real-time communications capabilities with the ISO-NE Control Center (each asset must pay for and maintain this communication capability and provide metering that is periodically used to verify the performance of each asset). Exh. RR-EFSB-101, at 7. For example, assuming that batteries are paired with solar locations (pursuant to the SMART program), many new communication circuits to ISO-NE's control center would need to be installed and paid for by each solar/battery asset according to ISO NE Operating Procedures. Id. at 7-8. Even assuming that resources are aggregated in 1 MW groups, the incremental cost of the communications circuits alone would be over $6 million in upfront costs and over $1.5 million per year on an ongoing basis. Id. at 8.

In addition, to connect additional distributed resources to the existing distribution infrastructure and control them to effectively respond to contingencies, a new Distribution Management System ("DMS") would need to be designed, procured and installed to monitor and respond to the various combinations of transmission system element contingencies that would result in thermal overloads and/or unacceptably low voltage levels. Exh. RR-EFSB-101, at 8. Modifications to the existing transmission system Energy Management Systems ("EMS") employed by Eversource, NEP, and ISO-NE would be needed to communicate to a DMS at all affected distribution operators - Eversource, NEP, HLPD, and Shrewsbury Municipal Light Department. Id. These systems, which would be essential to maintaining reliability on the local distribution system if an NTA based on distributed resources were to be implemented, are not presently in place. Id.

Regardless of the NTA solution (distributed or utility-scale), the operator would need to ensure a sufficient amount of generation could be brought on-line within 30 minutes after the first contingency event, and the operator would be required to balance the megavolt-ampere reactive ("MVar") flows in the load pocket, which may require capacitor banks and other advanced telemetry and software systems. Exhs. RR-EFSB-19, RR-EFSB-24(R1)(1) at 17. Operators would need to work carefully to balance these flows as a generator or generator(s) come online. Exh. RR-EFSB-19.

As a practical matter, even putting aside for the moment the cost and reliability issues described above, it is also important to consider whether an NTA could be constructed and brought into service in time to address the needs (which were identified as being pre-2013). Substantial time would be needed for construction of new supply-side resources, as well as all pre-development activities associated with the construction stage. Exh. RR-EFSB-24(R1)(1) at 16. Not including the project development effort (which involves project design, permitting, and siting, and can take many years to complete), the average time for constructing, testing and bringing online a new conventional generation project ranges between 18 and 48 months. Id. Any delays, such as in permitting and siting, interconnection requests with ISO-NE, compliance with environmental regulations, or identification of and contracting with equipment suppliers and construction vendors could result in delay in the availability of the NTA. Id.

Relatedly, under Massachusetts law, since the passage of the Electric Restructuring Act by the Legislature in 1997, the Company is not generally in the business of procuring additional generation, be it renewable or otherwise, unless it is in accordance with specific statutory directives imposed by the Legislature. Exhs. PROTECT-2-4(S-1); RR-EFSB-24(R1). Recent precedent from the Massachusetts Supreme Judicial Court has confirmed this limitation of electric

companies' legal authority in Massachusetts. Exhs. PROTECT-2-4(S-1); EV-EL-1, at 7; see ENGIE Gas & LNG LLC v. Department of Pub. Utils., 475 Mass 191, 205 (2016) (fundamental policy embodied in Restructuring Act is to remove electric distribution companies from the business of electric generation); id. at 209-210. To this end, the Company has no ability to force the marketplace to produce generation, renewable or otherwise, at a level or within the timing required to ensure reliability. Exh. EV-EL-1, at 7. Accordingly, without new statutory initiatives, implementing regulations, approval from the Department for the issuance of any request for proposals and the entry into a power-purchase agreement with an as-yet unknown third party, an NTA of the scope required to meet the identified need would be difficult and impractical to implement. Exh. RR-EFSB-24(R1). At a minimum, it would require several years and a series of statutory and regulatory initiatives to occur, and then several years more for the permitting and construction of sufficient generating facility capacity before such an alternative could be available to backstop customers' reliability requirements. Id.

Not only is there no specific statutory or regulatory path to allow the Company to move forward with a generation-related NTA, in New England, the decision to build a conventional generation project is linked to the prospect of securing capacity market revenues and the ISO-NE markets have not provided any incentives for the development of generation of sufficient size within the Marlborough Subarea. Exhs. RR-EFSB-24(R1); RR-EFSB-24(R1)(1) at 16. This is due to the fact that ISO-NE has had and is predicted to have sufficient supply to meet regional resource adequacy requirements into the medium term. Exh. RR-EFSB-24(R1). Accordingly, market prices have been and are projected to be insufficient to motivate such market-alternatives relative to the cost, which is likely due in part to the high cost of developing such generation. Id.

Therefore, it is critical to consider how a timely in-service date could affect the feasibility and revenue profile of a generating resource, and consequently the decision to build a facility. Exh. RR-EFSB-24(R1)(1) at 16. A generating resource projected to be commercialized by 2019 (the projected in-service date for the Project) and expecting to receive capacity market revenues would need to have cleared FCA#10, which occurred in February 2016, but none of the new projects that did so are located close to the substations under consideration. Id. at 17. Securing supply-side NTA resources in a timely fashion in order to meet the reliability requirements in the Marlborough Subarea would need to be done outside the Forward Capacity Market ("FCM") timetables and, thus, result in greater uncertainty and higher costs for ratepayers (because the project would not have material capacity revenues for some years that would have otherwise partially defrayed the generating resources' levelized fixed costs). Id. The feasibility of bringing this level of NTA resources to market at the location, scope, scale and timing that is required here is, at best, highly tenuous.

iv. Conclusion on NTAs

In summary, the practical challenges to development of conventional fossil-fuel or renewable generation in the Project area make technically feasible NTAs inferior alternatives to the Project. Exhs. EV-2, at 3-12; RR-EFSB-24(R1)(1). LEI's analysis shows that, while these NTAs hypothetically could meet the identified need, they would be unprecedented in scope, costly, and difficult to implement and control, particularly with an in-service date comparable to that of the Project. Exhs. EV-2, at 3-12 to 3-13; RR-EFSB-24(R1)(1). The higher cost to customers of any NTA to the Project, combined with the physical and logistical difficulties of implementing such a solution in a timely fashion, makes an NTA a substantially less desirable solution to the identified need than the Project. Exhs. EV-2, at 3-13; RR-EFSB-24(R1)(1). Additionally, no NTA

is capable of providing the additional transmission supply source and increased level of reliability to customers that the Project is able to provide. Exh. EV-2, at 3-13. Overall, consistent with Siting Board standards, the Project best meets the goal of providing a robust, secure and reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. Exh. EV-2, at 3-13.

3. Conclusion on Project Approach Alternatives

Based upon the foregoing, the Company determined that a new 115-kV transmission line between Sudbury Substation and Hudson Substation (i.e., the Project) is clearly the most effective solution in terms of system reliability, cost, and environmental impacts. Accordingly, the Siting Board should find that the proposed Project is superior to alternative approaches in terms of reliability, cost, environmental impact and the ability to meet the identified need.

**C. The Company's Route Selection Process Considered a Reasonable Range of Siting Alternatives and Resulted in a Project That Provides a Reliable Supply of Energy While Minimizing Environmental Impacts and Costs.**

1. Standard of Review

G.L. c. 164, § 69J requires the Siting Board to review alternatives to planned projects, including "other site locations." In implementing this statutory mandate, the Siting Board requires a petitioner to demonstrate that it has considered a reasonable range of practical siting alternatives and that the proposed facilities are sited in locations that minimize costs and environmental impacts while ensuring supply reliability. Eversource Mystic-East Eagle at 63; Eversource Walpole-Holbrook at 32; Eversource Mystic-Woburn at 26; Lower SEMA at 53-54. To do so, an applicant must satisfy a two-pronged test: (1) the applicant must first establish that it developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner that ensures that it has not overlooked or eliminated any routes that, on balance, are clearly superior to the proposed route; and (2) the applicant must establish that it identified at least two noticed

sites or routes with some measure of geographic diversity. Id. In applying this "clearly superior" standard, the Siting Board has found that a "methodical approach" to identifying potential routes, such as one focused on existing corridors, ensures that applicants do not overlook clearly superior routes. NSTAR Stoughton at 44. Relatedly, in narrowing down potential options, the Siting Board has approved processes that eliminate routes based upon permitting complexities, and high projected costs. NSTAR Stoughton at 44.

2. Overview of the Process

The Company's routing analysis methodology is developed as an adaptive and iterative approach to identify and evaluate possible routes for the proposed new transmission line in accordance with Siting Board precedent. Exh. EV-2, at 4-2. The routing analysis identified the route for the Project as the option that best balances minimization of environmental impacts (including developed and natural environment impacts and constructability constraints), reliability, and cost. Exh. EV-2, at 4-2. The analysis also identified a Noticed Variation to the Project as well as a Noticed Alternative Route that provides a geographically distinct alternative to the Project, while also striking a balance of the aforementioned factors. Exh. EV-2, at 4-2.

The Company conducted a systematic and comprehensive analysis of routing alternatives for the Project to identify a reasonable variety of potential candidate routes for screening and analysis in order to ensure that a clearly superior route was not overlooked and that the Project route was selected consistent with the Siting Board's standards and applicable precedent. See, e.g., Exh. EV-2, at § 4.0. For this case, the Company also studied three different design variations to the physical configuration of the proposed New Line to supplement the standard evaluation of potential alternative route options. Exh. EV-2, at 4-2. Specifically, the Company considered a primarily overhead transmission line design and a primarily underground transmission line design along the inactive railroad corridor owned by the MBTA ("MBTA ROW"), where some of the

possible routes are located. Exh. EV-2, at 4-2. Given that design variations along the MBTA ROW pose different potential impacts to developed and natural environmental features and have varying associated costs, the Company included these design variations in the routing analysis. Exh. EV-2, at 4-2.

The objective of the Company's routing analysis was to identify a cost-effective and technically feasible design that achieved the required transmission system reliability improvements by interconnecting the specified substations. Exh. EV-2, at 4-2. Additional consideration was given to the potential impacts the candidate solutions may have on the developed and natural environment. Exh. EV-2, at 4-2. These objectives primarily included:

- Comply with all applicable statutory requirements, regulations, and state and federal siting agency policies;
- Achieve a reliable, operable, and cost-effective solution;
- Maximize the reasonable, practical, and feasible use of existing linear corridors (e.g., transmission line, highway, railroad, or pipeline ROWs); and
- Maximize the potential for direct routing options over circuitous routes

Exh. EV-2, at 4-2 to 4-3.

3. Identification of Study Area and Initial Development of Routes

Following the establishment of the routing objectives, the Company reviewed the region between the existing Sudbury and Hudson Substations and demarcated a geographic "Project Study Area," to concentrate the investigation of potential routes. Exh. EV-2, at 4-6, Fig. 4-1. Within this Project Study Area, the Company looked for existing linear corridors (e.g., existing rail, gas, and electric ROWs and public roadway corridors) that appeared to be feasible to facilitate construction of a new line and could provide a reasonably direct route between the two substations. Exh. EV-2, at 4-6.

The majority of the Project Study Area is located within the municipalities of Sudbury, Wayland, Framingham, Marlborough, Hudson and Stow. Exh. EV-2, at 4-6. The northern edge of the Project Study Area is generally defined by Route 27. Exh. EV-2, at 4-6. The center of the Project Study Area between the two substations is defined by the inactive MBTA ROW, which runs in an east-west direction. Exh. EV-2, at 4-6. The southern boundary of the Project Study Area is generally defined by Route 20. Exh. EV-2, at 4-6. Much of the center of the Project Study Area consists of federal, municipal and private open space areas including conservation, recreational, agricultural and water protection supply areas. Exh. EV-2, at 4-6. Major bodies of water in the area include Wash Brook, Dudley Brook, Hop Brook, Willis Lake, Puffers Pond, Taylor Brook, White Pond, Fort Meadow Brook, Lake Boon and the Assabet River. Exh. EV-2, at 4-6.

In general, the eastern end of the Project Study Area in Sudbury and the western end in Hudson and Marlborough are more developed areas with primarily residential uses, but with some commercial areas and occasional industrial uses. Exh. EV-2, at 4-6. In Sudbury and Marlborough, commercial/industrial land uses are concentrated along Boston Post Road/Route 20. Exh. EV-2, at 4-6. In Hudson, commercial/industrial land uses are concentrated along Main Street/Route 62.

Using the routing objectives identified above, and in conjunction with public input, the Company reviewed USGS maps, MassGIS data, and aerial photography; field reconnaissance was conducted to identify the Universe of Routes that could support a new line between the two substations, including the utilization of existing linear corridors. Exh. EV-2, at 4-7. The Company also evaluated suggested routes for the New Line from stakeholders such as town officials, Northeast Logistics, LLC ("NELS"), and the citizens group, Protect Sudbury, thus giving due consideration to public input. Exhs. EV-2, at 4-7; EFSB-RS-3; EV-MB-2, at 3. These route

options were incorporated into the Universe of Routes that were considered for the New Line. Exh. EV-2, at 4-7, Fig. 4-2.

The Universe of Routes identified by the Company, with input from stakeholders,[49] consisted of a total of 30 route options (including alternative designs) along 21 distinct alignments or "routes" that were initially screened. Exhs. EV-2, at 4-7; EV-MB-2, at 3; Tr. 5, at 836. Consistent with Siting Board precedent, all 30 route options were screened for the purposes of determining their suitability or feasibility for more detailed analysis. The initial screening process included reviewing publicly available data to consider existing abutting land uses and the presence of natural resources (e.g., wetlands, waterways and rare species habitat). Exhs. EV-2, at 4-7; EV-MB-2, at 4. In addition, traffic experts conducted field investigations to confirm general traffic patterns and volumes as applicable to the route. Exhs. EV-2, at 4-7; EV-MB-2, at 4. The Company also reviewed the routes for critical constructability issues that would preclude construction, such as difficult bends or existing underground utility congestion. Exhs. EV-2, at 4-7; EV-MB-2, at 4. Real estate personnel reviewed existing ownership and easement details along existing electric or gas transmission ROWs. Exh. EV-2, at 4-7. The Company also considered other information received from various meetings with municipal staff members, stakeholder groups, and from the two public Open Houses, with a particular emphasis on input received from local officials regarding public roadways that the Company should avoid and/or consider. Exhs. EV-2, at 4-7; EV-MB-2, at 4. Route options were eliminated from further consideration if they were found to be unsuitable for transmission line development. Exh. EV-2, at 4-7.

[49] Company representatives met with federal, state and municipal officials, residents/business owners, and other stakeholders to discuss the Universe of Routes under consideration for the New Line and to obtain input on these routing options. Exh. EV-2, at 4-4. This process began in January 2014 and included more than 48 meetings. Exh. EV-2, at 1-10 to 1-12, 4-4 to 4-5, Table 1-1, Table 4-1; Tr. 5, at 839; Exhs. PROTECT-21, PROTECT-2-80 and PROTECT-2-118.

Through the screening process, the Company determined that nine of the 21 routes were inappropriate for further consideration as Candidate Routes. These routes were eliminated for a variety of reasons including: similar but inferior to other routes, existing utility easements too narrow, longer or more circuitous than other routes, easements or other property interests would be required, abutting more businesses and residences than other similar routes, passing through historic town center where municipal officials requested that town center be avoided, and existence of other transmission lines or other utilities that would cause operational problems for the New Line. Exh. EV-2, at 4-7, Table-4-2, Fig. 4-3. The remaining twelve routes were advanced as Candidate Routes for more detailed evaluation, five of which had associated design variations. Exh. EV-2, at 4-7.

4. Identification of Candidate Routes

Following the elimination of some routes from the Universe of Routes during the screening process, the Company advanced a total of 20 route options along 12 distinct route alignments ("Candidate Routes") for more detailed analysis, scoring, and applying weights, as described below. Exh. EV-2, at 4-10, Fig. 4-4, Table 4-3, Appendix 4-1; EV-MB-2, at 4. A brief summary of the Candidate Routes is presented below.

Candidate Routes 1, 2 and 3 would primarily travel from the Sudbury Substation along the inactive MBTA ROW, with shorter sections at the west end traveling underground in various public roadways to the Hudson Substation. Exh. EV-2, at 4-10, Figs. 4-5, 4-6, 4-7. For Candidate Routes 1, 2 and 3, the Company evaluated three different transmission line design variations for the portion along the MBTA ROW: (1) an all overhead design in the MBTA ROW, denoted with the letter "A," (2) an all underground design, denoted with the letter "B," and (3) a combination overhead and underground design (the "hybrid option"), denoted with the letter "C." Exh. EV-2,

at 4-10. All three Candidate Routes transition underground into public roadways in Hudson, once the routes leave the MBTA ROW. Exh. EV-2, at 4-10.

Candidate Routes 9 and 10 would begin at Sudbury Substation and travel within the MBTA ROW for a short distance, then transition underground in Sudbury into public roadways and continue into Stow and Hudson for the remainder of their length. For Candidate Routes 9 and 10, the Company evaluated two design variations along the MBTA ROW: overhead ("A") and underground ("B"). Exh. EV-2, at 4-11, Figs. 4-13, 4-14.

The Company also evaluated seven routes that would travel entirely in public roadways (Candidate Routes 4, 5, 5A, 6, 7, 8, and 11). Exh. EV-2, at 4-11, Fig. 4-8 through 4-12, Fig. 4-15. All of these routes would exit the Sudbury Substation via the existing driveway and travel west on Route 20 for various distances.

5. Environmental and Constructability Analysis

The Company evaluated the 20 Candidate Routes using a set of 17 criteria to compare Candidate Routes. Exh. EV-2, at 4-15.[50] The Candidate Routes included routes that utilize various types of existing corridors, including public roadways and the inactive MBTA ROW transportation corridor that are adjacent to a mix of both developed (urban/suburban) and natural environmental land uses. Exh. EV-MB-2, at 4. In addition, the Candidate Routes carried forward to the detailed

[50] It is inappropriate to include Transmission Alternative 2, the NEP Alternative, in the route selection process because it is an entirely different project approach to solve the identified needs in the area. Exh. EV-MB-2, at 2. The NEP Alternative is not a route option - it does not present an additional alternative route for the construction of a new line between the Sudbury and Hudson Substations, which was the solution selected by ISO-NE to meet the need in the area. The NEP Alternative would include the conversion of an existing transmission line from 69-kV to 115-kV, the reconductoring two additional 115-kV lines, and substantial upgrades to five NEP substations. Because the NEP Alternative is a different transmission alternative to the Project that consists of an entirely different solution to address the identified electric system reliability need in the Marlborough Subarea, it would be improper to evaluate it as a route option. Exhs. EV-MB-2, at 3, 19-20; EV-JZ-1. Protect Sudbury's assertion of such demonstrates a misunderstanding of two completely different evaluations: (1) the Company's analysis of Project alternatives; and (2) its separate route selection process. Exh. EV-MB-2, at 2-3. The Company properly evaluated the NEP Alternative, including its potential environmental impacts, as a Project alternative rather than a route alternative. Exh. EV-MB-2, at 3.

scoring analysis are of various electrical configurations or designs; including an overhead and an underground design. Exh. EV-MB-2, at 4. Route options consisted of an all-overhead design along the MBTA ROW, an all-underground design along the MBTA ROW, various options within public roadways, and a combination or hybrid design of overhead and underground along the MBTA ROW. Exh. EV-MB-2, at 4. It was therefore necessary to select criteria that allowed for an appropriate analysis of all these different variables given that the Candidate Routes for this Project are located along different types of corridors with different types of environmental features along and adjacent to them and given that the Candidate Routes include different types of project designs. Exh. EV-MB-2, at 4-5. Accordingly, the collective set of 17 criteria selected by the Company for the Project are designed to characterize important natural and developed environmental considerations in the Project Study Area, identify key temporary and permanent impacts to these natural and developed environments, and to factor in key construction differences amongst the Candidate Routes that could influence either the duration or order of magnitude of the temporary and permanent impacts. Exh. EV-MB-2, at 5.

The criteria were grouped into the following three subcategories:

a) Seven developed environment criteria: (1) residential land uses; (2) sensitive receptors;[51] (3) potential for traffic congestion; (4) commercial/industrial land uses; (5) scenic roadways; (6) cultural resources; and (7) potential to encounter subsurface contamination during construction. Exh. EV-2, at 4-16 to 4-20.

b) Six natural environmental criteria: (1) tree clearing; (2) wetland resource areas; (3) state-listed rare species habitat; (4) public water supplies; (5) conservation land uses; and (6) public shade trees. Exh. EV-2, at 4-20 to 4-23.[52]

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51 Sensitive receptors include: hospitals, elder care facilities, schools, horse farms, cemeteries, daycares, district courts, nursing homes, police stations, fire stations, recreational uses and religious facilities directly abutting the Candidate Route. Exhs. EV-2, at 4-17; EFSB-RS-12.

52 There are no Areas of Critical Environmental Concern ("ACEC") or Outstanding Resource Waters ("ORW") present along any of the Candidate Routes. Exh. EV-2, at 4-22.

c) Four constructability criteria: (1) trenchless crossings; (2) existing utility density; (3) length of route; and (4) hard angles. Exh. EV-2, at 4-23 to 4-25.[53]

Several of the criteria used for this Project were included specifically based upon public input, including: scenic roadways, public water supplies, conservation lands and tree clearing.[54] Exh. EV-MB-2, at 5.

Following the development of criteria to be used for the environmental and constructability analysis, the Company assigned weights to each individual criterion. Exh. EV-2, at 4-15. The weighting assigned by Eversource to each criterion takes into account the following considerations: (1) the potential temporary and permanent impacts that could result from construction; (2) the availability of best management practices or construction techniques to minimize these temporary or permanent impacts; and (3) public input. Exh. EV-MB-2, at 5-6. As shown in the table below, the weighting scale ranges from 1 to 5, with 1 being the lowest weight

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53 Constructability criteria are important considerations that allow the Company to identify measurable factors that can differentiate between the duration and magnitude of impact to the environment along each Candidate Route that cannot necessarily be captured in the scoring for each particular environmental criterion. Exh. EV-MB-2, at 2, 9-11.

54 Protect Sudbury asserts that a new criterion – impact duration – be added to the Company's scoring analysis. Exh. Protect-RC/RH/ML/MO-2. Adding this criterion would be in error because the Company has already factored impact duration into its current analysis by including criteria that address temporary and permanent impact considerations. Exh. EV-MB-2, at 7-8. The criteria categories of tree clearing, public shade trees, wetland resource areas, and state-listed rare species habitat identify the anticipated areas of disturbance from each route option (based upon conceptual engineering available at the time). Id. These impacts are considered to be permanent and given the highest level of importance with an assigned weight of 5. Id. In addition, the Company assumed that there would be no impact to conservation lands from any route portion located within a public roadway and removed that from the totals calculated for that criterion so that public roadway routes were properly evaluated and considered. Id. Categories that evaluate temporary impacts include potential only for subsurface contamination and the potential for traffic congestion. Id. Moreover, Protect Sudbury's analysis is further flawed because it assumed the worst-case construction period to be 24 months, presumably because the Company identified this as the anticipated construction period in Table 5-1 at page 5-26 of Exh. EV-2. Id. It is important to note, however, that this is the construction period associated with the public roadway route selected by the Company as the Noticed Alternative Route and is unique to that particular route given the analysis completed. Id. Given other factors such as, but not limited to, higher potential for traffic congestion, higher density of underground utilities, longer route length, more hard angles, and potentially more trenchless crossings, other public roadway candidate routes may have a much longer construction period beyond 24 months. Id.

and 5 being the highest weight that could be applied to a particular environmental criterion. Exh. EV-2, at 4-15.

| Criterion | Assigned Weight |
|---|---|
| **Developed Environment** | |
| **Residential Land Use** | 5 |
| **Commercial/Industrial Land Use** | 4 |
| **Sensitive Receptors** | 5 |
| **Cultural Resources** | 2 |
| **Scenic Roadways** | 4 |
| **Potential for Traffic Congestion** | 5 |
| **Potential to Encounter Subsurface Contamination** | 1 |
| **Natural Environment** | |
| **Public Shade Trees** | 1 |
| **Tree Clearing Area** | 5 |
| **Wetlands Resource Areas** | 5 |
| **Public Water Supplies** | 3 |
| **State-Listed Rare Species Habitat** | 5 |
| **Conservation Land Use** | 3 |
| **Constructability** | |
| **Route Length** | 1 |
| **Trenchless Crossings** | 3 |
| **Utility Density** | 3 |
| **Number of Hard Angles (Bends)** | 1 |

Exh. EV-2, at 4-25, Table 4-4. See also Exhs. EFSB-RS-7; EFSB-RS-8; EFSB-RS-9; EFSB-RS-10; EFSB-RS-11; EFSB-RS-14.

The Company chose to use a scale of 1-5 for the Project, instead of the more commonly utilized 1-3 scale range, to implement a scoring system that would provide greater granularity in comparing the benefits or impacts of each Candidate Route. Exh. EFSB-RS-1. Given the extensive number of Candidate Routes combined with design options for this Project, the Company believes that the 1-5 scale was a better evaluation method that would provide results with a clear numerical separation of those routes with higher degrees of impacts to the environmental criterion analyzed. Exh. EFSB-RS-1.

The scoring categories and associated weights for the Sudbury-Hudson Project were established by Company personnel and outside consultants who are experienced in route

evaluation and were based on both the team's best judgment, as well as in consideration of the weighting of scoring criteria in numerous previous projects considered by the Siting Board. Exh. EFSB-RS-1. The criteria and weights were developed to reflect the defined routing objectives, public feedback, and environmental and constructability factors, including the potential for temporary and permanent impacts. Exhs. EFSB-RS-1; SUD-RS-1(S-1); EV-MB-2, at 6. Because the Routing Study Area consists of both developed (e.g., urban/suburban) and natural environment (e.g., forested, open space, wetlands) areas, the environmental criteria are associated with the potential for disruption to both the built and natural environment. Exhs. EFSB-RS-1; SUD-RS-1(S-1).

After identifying the environmental criteria and assigning weights, the Company completed a scoring evaluation for each Candidate Route. Exh. EV-2, at 4-16. The Company scored, weighted and ranked each Candidate Route to reflect its ease of constructability and its potential for impacts to the developed and natural environment. Exh. EV-2, at 4-16. After gathering data for each Candidate Route, the Company assessed each criterion and identified the Candidate Route that had the largest number for that criterion. Exh. EV-2, at 4-16. Consistent with recent transmission project reviews before the Siting Board,[55] all other routes/designs were then compared against this number to arrive at a "ratio score" for each Candidate Route on a scale of 0 to 1.[56] Exh. EV-2, at 4-16. The lowest ratio score would equate to the lowest potential for

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[55] The Company's use of ratio scoring in this proceeding is in accordance with the ratio scoring methodologies presented to the Siting Board in other recent and pending cases. See, e.g., Eversource Mystic-East Eagle at 66-68, 74; Eversource Mystic-Woburn at 29-32; NEP IRP at 45; Lower SEMA at 55-57; Western Massachusetts Electric Company, 18 DOMSB 1, EFSB 08-2/D.P.U. 08-105/08-106, at 44-47 ("GSRP Decision"); see also NSTAR Electric Company d/b/a Eversource Energy, EFSB 16-02/D.P.U. 16-77 ("Eversource West Roxbury-Needham"); NSTAR Electric Company d/b/a Eversource Energy and New England Power Company d/b/a National Grid, EFSB 15-04/D.P.U. 15-140/15-141 ("Eversource/NEP Woburn-Wakefield").

[56] For example, if Candidate Route X had 5 trees to be removed, Candidate Route Y had 10 trees, and Candidate Route Z had 15 trees, the ratio scores would be calculated as shown in the following table.

impact. Exh. EV-2, at 4-16. For each criterion, the ratio score was then multiplied by its assigned weight to produce a weighted score that magnified the criterion by its relative importance. Exh. EV-2, at 4-16.

The ratio and weighted scores for each criterion were added to arrive at "total ratio scores" and "total weighted scores." Exh. EV-2, at 4-16. The total weighted scores were then sorted in order from low to high, to identify a given Candidate Route's "rank." Exh. EV-2, at 4-16. The lowest weighted score would equate to the lowest potential for impact with emphasis on certain criterion as previously described in this section. Exh. EV-2, at 4-16. The rankings developed in the Company's routing analysis are based on the total weighted scores. Exh. EV-2, at 4-16.

6. Comparison of Routes

The Company's comparative analysis of the Candidate Routes is presented below. The analysis demonstrates that the Company's route selection process was rigorous, thorough and objective, thereby supporting the Company's selection of the Preferred Route for the Project as the route that is constructible and best balances considerations of environmental impacts, cost and reliability. By any reasonable measure, none of the alternative constructible routes presented in this proceeding are clearly superior to the Preferred Route.

| **Candidate Route** | **Number of Trees** | **Ratio Score** |
|---|---|---|
| *Candidate Route X* | 5 | 5 ÷ 15 = **0.33** |
| *Candidate Route Y* | 10 | 10 ÷ 15 = **0.66** |
| *Candidate Route Z* | 15 | 15 ÷ 15 = **1.00** |

Exh. EV-2, at 4-16.

a. Environmental and Constructability Analysis

The table below presents a summary of the 20 Candidate Routes ranked by total weighted environmental score. Exh. EV-2, at 4-26. The lowest total weighted score equates to the lowest potential for impact (ranked 1), and the highest total weighted score equates to the highest potential for impact (ranked 20), with the emphasis on certain criteria as described above. Exh. EV-2, at 4-26.

**Environmental Rank by Total Weighted Scores**

| Candidate Route | | Route Length (miles) | Total Weighted Score | Rank |
|---|---|---|---|---|
| Option 2B | MBTA ROW (UG) to Wilkins | 9.01 | 17.60 | 1 |
| Option 3B | MBTA ROW (UG) to Woodrow | 9.19 | 17.66 | 2 |
| Option 1C | MBTA ROW Hybrid to Chestnut | 9.33 | 18.34 | 3 |
| Option 1B | MBTA ROW (UG) to Chestnut | 9.33 | 18.85 | 4 |
| Option 2C | MBTA ROW Hybrid to Wilkins | 9.01 | 19.06 | 5 |
| Option 3C | MBTA ROW Hybrid to Woodrow | 9.19 | 19.12 | 6 |
| Option 11 | Route 20 to Greenhill to Hudson | 10.30 | 21.37 | 7 |
| Option 10B | MBTA (UG) to Horse Pond to Hudson | 10.48 | 21.43 | 8 |
| Option 10A | MBTA (OH) to Horse Pond to Hudson | 10.48 | 23.48 | 9 |
| Option 9B | MBTA (UG) to Station to Union to Hudson | 10.71 | 23.51 | 10 |
| Option 4 | Route 20 to Concord to Hudson | 10.46 | 24.04 | 11 |
| Option 5A | Route 20 to Station to Union to Hudson | 10.75 | 24.30 | 12 |
| Option 9A | MBTA (OH) to Station to Union to Hudson | 10.71 | 24.69 | 13 |
| Option 6 | Route 20 to Horse Pond to Hudson | 11.10 | 25.16 | 14 |
| Option 5 | Route 20 to Union to Hudson | 10.93 | 25.68 | 15 |
| Option 7 | Route 20 to Sudbury to Main | 10.85 | 26.71 | 16 |
| Option 2A | MBTA ROW (OH) to Wilkins | 9.01 | 27.26 | 17 |
| Option 3A | MBTA ROW (OH) to Woodrow | 9.19 | 27.49 | 18 |
| Option 1A | MBTA ROW (OH) to Chestnut | 9.33 | 27.61 | 19 |
| Option 8 | Route 20 to Hosmer to Causeway | 11.10 | 32.93 | 20 |

Exh. EV-2, at 4-29, Table 4-5; EV-15, at 1 Table 4-6(R).

As shown in the table above, Candidate Route 2B (MBTA ROW (UG) to Wilkins) has the lowest weighted total environmental score and would result in the lowest potential for impact of all the Candidate Routes. Exh. EV-2, at 4-29; Tr. 4, at 706. The Candidate Route that is located entirely within public roadways with the lowest weighted total environmental score is Candidate

Route 11 (Route 20 to Green Hill Road to Hudson). Exh. EV-2, at 4-29; Tr. 4, at 706. This route is a geographically distinct routing alternative to Candidate Route 2B. Exh. EV-2, at 4-29.

Because of the nature of the different Candidate Routes (e.g., public roadways, MBTA ROW, etc.) and given the considerations necessary to differentiate various design options (e.g., overhead, underground, and hybrid designs), the Company conducted a more detailed route scoring analysis by separately scoring the Candidate Routes with respect to the three distinct environmental criteria subcategories: the developed environment, the natural environment and constructability.[57] Exhs. EV-2, at 4-30 to 4-33, Tables 4-7, 4-8, 4-9; EV-15; Tr. 4, at 706-07, 726-27. Based on this further analysis, Candidate Route 11 (Route 20 to Green Hill Road to Hudson) has a lower potential for impacts to the natural environment criteria but has a higher potential for impacts to the developed environment criteria than Candidate Route 2B (MBTA ROW (UG) to Wilkins). Exh. EV-2, at 4-30. However, of the public roadway Candidate Routes considered, Candidate Route 11 has the lowest potential for impact to the developed environment. Exh. EV-2, at 4-30.

The potential for impacts to the developed environment increases for those Candidate Routes with longer distances along Route 20 (Options 4, 5, 5A, 6, 7 and 8). Exh. EV-2, at 4-30. Route 20 (also known as Boston Post Road) is a major commuter roadway, serving drivers within the western suburbs of Boston. Exh. EV-2, at 4-30. Route 20 has high volumes of daily weekday traffic with over 1,000 vehicles per hour observed during midday time periods and is classified by the MassDOT as an "urban principal arterial" roadway. Exh. EV-2, at 4-30. Based on discussions with MassDOT, construction along this corridor could include the following limitations:

[57] Developed environment criteria compare existing conditions of, and potential impacts to, the developed environment and surrounding population. Natural environment criteria compare existing conditions of, and potential impacts to, the natural environment. Constructability criteria compare route location and design factors that may add complexity to construction.

- Limited weekday work hours to avoid peak traffic hours
- Limited weekend work hours
- No options to detour traffic off Route 20 and on to local roads (will not be allowed by MassDOT)
- Use of cranes may be restricted to weekends only
- Night work may be required with work hours potentially from 9:00 p.m. to 5:00 a.m.
- Significant roadway restoration and/or upgrade requirements (typically more extensive than those required on local roadways)

Exhs. EV-2, at 4-30; EFSB-T-11.

All of these considerations identified by MassDOT could result in the potential for longer construction durations and for higher project costs for those Candidate Routes located for longer distances along Route 20. Exh. EV-2, at 4-31.

b. Cost

As part of the route selection process, the Company evaluated the conceptual (-25/+50%) total cost estimates for each Candidate Route in order to rank the various Candidate Routes. Exhs. EV-2, at 4-33 to 4-34, Table 4-10. Many factors could affect the actual cost of a transmission line project, including cost and availability of materials and equipment, labor, the presence of contaminated soils, and the potential for work hour restrictions imposed on the local community or other entities. Exh. EV-2, at 4-33. For an underground line, subsurface conditions such as the type and depth of soil and rock that must be excavated in order to place the duct bank could also significantly affect project cost. Exh. EV-2, at 4-33.

A summary of the conceptual cost estimates is provided in the table below. Candidate Routes with overhead designs and those located along the MBTA ROW would generally result in lower costs to construct compared to those located underground in public roadways. Exh. EV-2,

at 4-33 to 4-34. Candidate Route 3A (MBTA ROW (OH) to Woodrow) has the lowest cost overall. Exh. EV-2, at 4-34. The next lowest-cost Candidate Route that provided a geographically distinct routing alternative by following public roadways is Candidate Route 11 (Route 20 to Green Hill to Hudson). Exh. EV-2, at 4-34.

**Candidate Route Conceptual Cost Estimates**

| Candidate Route | | Total (millions)[1] | Rank | Percent more than lowest cost option |
|---|---|---|---|---|
| 3A | MBTA ROW (OH) to Woodrow | $43.3 | 1 | 0% |
| 2A | MBTA ROW (OH) to Wilkins | $44.2 | 2 | 2% |
| 1A | MBTA ROW (OH) to Chestnut | $50.5 | 3 | 17% |
| 2C | MBTA ROW Hybrid to Wilkins | $83.5 | 4 | 93% |
| 3C | MBTA ROW Hybrid to Woodrow | $85.4 | 5 | 97% |
| 1C | MBTA ROW Hybrid to Chestnut | $88.1 | 6 | 103% |
| 2B | MBTA ROW (UG) to Wilkins | $91.0 | 7 | 110% |
| 3B | MBTA ROW (UG) to Woodrow | $94.5 | 8 | 118% |
| 1B | MBTA ROW (UG) to Chestnut | $95.4 | 9 | 120% |
| 10A | MBTA (OH) to Horse Pond to Hudson | $95.9 | 10 | 121% |
| 9A | MBTA (OH) to Station to Union to Hudson | $106.1 | 11 | 145% |
| 10B | MBTA (UG) to Horse Pond to Hudson | $109.4 | 12 | 153% |
| 11 | Route 20 to Green Hill to Hudson | $110.4 | 13 | 155% |
| 4 | Route 20 to Concord to Hudson | $113.7 | 14 | 163% |
| 9B | MBTA (UG) to Station to Union to Hudson | $114.5 | 15 | 164% |
| 5A | Route 20 to Station to Union to Hudson | $118.1 | 16 | 173% |
| 5 | Route 20 to Union to Hudson | $119.7 | 17 | 176% |
| 6 | Route 20 to Horse Pond to Hudson | $120.2 | 18 | 177% |
| 7 | Route 20-Sudbury-Main | $127.0 | 19 | 193% |
| 8 | Route 20-Hosmer-Causeway | $132.9 | 20 | 207% |

[1] Totals are based on estimates of required costs for transmission line design; substation upgrades to Sudbury; land acquisition; survey; environmental compliance; environmental mitigation; regulatory compliance; legal support; construction management; public outreach; risks; and other potential extraneous costs.

Exh. EV-2, at 4-34, Table 4-10.

c. Reliability

The Company considered whether there was a difference among the Candidate Routes with regard to the reliability. Exh. EV-2, at 4-34. Increased length of a transmission system, in theory, could introduce additional exposure to potential faults. Exh. EV-2, at 4-34. However, all of the Candidate Routes have relatively small differences in length such that the Company did not

consider the length of the routes would result in any substantial difference in their level of risk. Exh. EV-2, at 4-34 to 4-35. While an underground line may be less susceptible to weather-induced outages, an overhead line takes much less time to repair in the event of an outage (days rather than weeks). Exh. EV-2, at 4-35. However, both underground and overhead transmission technologies are both inherently reliable. Exh. EV-2, at 4-35. Accordingly, reliability was not a determining factor when comparing Candidate Routes. Exh. EV-2, at 4-35.

7. Selection of Project, Noticed Variation and Noticed Alternative Route

The table below presents a comprehensive summary of all Candidate Routes and their relative rankings with respect to the natural environment, developed environment, constructability overall environmental score and cost. Exh. EV-2, at 4-35.

**Ranking Summary of Candidate Routes**

| Candidate Route | | Developed Environment | Natural Environment | Constructability | Total Environmental | Cost |
|---|---|---|---|---|---|---|
| 1A | MBTA ROW (OH) to Chestnut | 9 | 18 | 8 | 19 | 3 |
| 1B | MBTA ROW (UG) to Chestnut | 7 | 13 | 8 | 4 | 9 |
| 1C | MBTA ROW (Hybrid) to Chestnut | 8 | 12 | 8 | 3 | 6 |
| 2A | MBTA ROW (OH) to Wilkins | 3 | 19 | 5 | 17 | 2 |
| 2B | MBTA ROW (UG) to Wilkins | 1 | 14 | 5 | 1 | 7 |
| 2C | MBTA ROW (Hybrid) to Wilkins | 2 | 16 | 5 | 5 | 4 |
| 3A | MBTA ROW (OH) to Woodrow | 6 | 20 | 1 | 18 | 1 |
| 3B | MBTA ROW (UG) to Woodrow | 4 | 15 | 2.5 | 2 | 8 |
| 3C | MBTA ROW (Hybrid) to Woodrow | 5 | 17 | 2.5 | 6 | 5 |
| 4 | Route 20 to Concord to Hudson | 16 | 4 | 14 | 11 | 14 |
| 5 | Route 20 to Union to Hudson | 18 | 6 | 17 | 15 | 17 |
| 5A | Route 20 to Station to Union to Hudson | 15 | 5 | 18 | 12 | 16 |
| 6 | Route 20 to Horse Pond to Hudson | 17 | 7 | 15 | 14 | 18 |
| 7 | Route 20 to Sudbury to Main | 19 | 2 | 20 | 16 | 19 |
| 8 | Route 20 to Hosmer to Causeway | 20 | 1 | 19 | 20 | 20 |
| 9A | MBTA (OH) to Station to Union to Hudson | 13.5 | 10 | 12.5 | 13 | 11 |
| 9B | MBTA (UG) to Station to Union to Hudson | 13.5 | 8 | 12.5 | 10 | 15 |
| 10A | MBTA (OH) to Horse Pond to Hudson | 11 | 11 | 10.5 | 9 | 10 |
| 10B | MBTA (UG) to Horse Pond to Hudson | 10 | 9 | 10.5 | 8 | 12 |
| 11 | Route 20 to Green Hill to Hudson | 12 | 3 | 16 | 7 | 13 |

Exh. EV-15, at 4, Table 4-11(R).

The Company balanced considerations of impacts and costs in selecting the Project. Exh. EV-2, at 4-36. Candidate Route 2B (MBTA ROW (UG) to Wilkins) has the lowest overall environmental score and was chosen as the Preferred Route for the Project.[58] Exh. EV-2, at 4-36. Candidate Route 2A (MBTA ROW (OH) to Wilkins) has a significantly lower cost than Candidate Route 2B, but also significantly greater environmental impacts. Exh. EV-2, at 4-36. Accordingly, the Company designated Candidate Route 2A as a Noticed Variation to the Project and advanced it for further analysis. Exh. EV-2, at 4-36.[59]

In considering a geographically distinct routing alternative, Candidate Route 11 (Route 20 to Green Hill to Hudson), a stakeholder-identified route, was identified as the all-underground roadway route that would result in the lowest potential for environmental impacts as well as the lowest cost. Exh. EV-2, at 4-37. The Company therefore selected Candidate Route 11 as the Noticed Alternative Route.[60] Exh. EV-2, at 4-37.

8. Conclusion on Route Selection Process

The route selection process undertaken by the Company addresses in a comprehensive fashion the Siting Board's standards applicable to jurisdictional energy facilities. As shown herein, the Company has "developed and applied a reasonable set of criteria for identifying and evaluating alternative routes." See Eversource Mystic-East Eagle at 63. In accordance with the standard of review, the Company objectively and comprehensively developed and assessed a wide array of potential routes and design variations within the bounds of the Project Study Area. Exh. EV-2, at 4-37. At the conclusion of this process, the Company identified a preferred Project, Noticed

58 The Preferred Route for the Project is described in detail in Section III.A., above.

59 The Noticed Variation is described in detail in Section III.B., above.

60 The Noticed Alternative Route is described in detail in Section III.C., above.

Variation and Noticed Alternative Route that best balanced environmental impacts, costs, and reliability and enable the Company to meet the identified need. Exh. EV-2, at 4-37. The Company's systematic approach to identifying and assessing potential routes ensured that no clearly superior routes were overlooked or ignored.[61] See NSTAR Stoughton at 44.

The Siting Board should therefore approve the Company's route selection process in this proceeding.

### D. Comparison of the Preferred Route, the Noticed Alternative Route and the Noticed Variation

#### 1. Standard of Review

In implementing its statutory mandate to ensure a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost, the Siting Board requires a petitioner to show that its proposed facility is sited at a location that minimizes costs and environmental impacts while ensuring a reliable energy supply. To determine whether such a showing is made, the Siting Board requires a petitioner to demonstrate that the proposed route for the facility is superior to the alternative route on the basis of balancing cost,

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[61] The Company notes that Protect Sudbury took issue with the Company's route selection process, asserting that Eversource did not: (1) develop the appropriate criteria to compare the routes, (2) assign the correct weight to certain criteria, and (3) evaluate impacts properly during route scoring, and that weights assigned to each criterion should be dependent upon stakeholder point of view. Exh. PROTECT-RC/RH/ML/MO-1, at 7-24. It is clear that Protect Sudbury's criticism of the Company's well-reasoned routing analysis and its own "routing analysis" was completely unbalanced, relying solely on Protect Sudbury's point of view and interest in attempting to demonstrate that the Noticed Alternative should have scored as the best route for the Project. "The reasonable self-interests of [affected stakeholders] make this both an unsurprising circumstance and one that well illustrates the importance of the Siting Board's reliance on an objective, data-driven route selection process to ensure that, on an overall project-wide basis, proposed facilities are sited in locations that minimize environmental impacts and costs and ensure reliability." NSTAR Electric Company d/b/a Eversource Energy and New England Power Company d/b/a National Grid, EFSB 15-04/D.P.U. 15-140/15-141, at 67 (2018) ("Woburn-Wakefield"). The Company's route selection process developed appropriate criteria to objectively evaluate the range of route alternatives, including both overhead and underground designs along an inactive transportation corridor as well as many in-road route options. It is consistent with Siting Board precedent and has been repeatedly used by the Company to evaluate potential routes for its various transmission projects.

environmental impact and reliability of supply. Eversource Mystic-East Eagle at 76-77; Eversource Walpole-Holbrook at 38-39; Eversource Mystic-Woburn at 33; Lower SEMA at 57.

An assessment of all impacts of a proposed facility is necessary to determine whether an appropriate balance is achieved both among conflicting environmental concerns as well as among environmental impacts, cost and reliability. A facility that achieves that appropriate balance meets the Siting Board's statutory requirement to minimize environmental impacts at the lowest possible cost. Eversource Mystic-East Eagle at 77; Eversource Walpole-Holbrook at 39; Eversource Mystic-Woburn at 33; Russell Biomass, LLC and Western Massachusetts Electric Company, 17 DOMSB 1, EFSB 07-4/D.P.U. 07-35/07-36, at 28 (2009) ("Russell 2009").

In order to determine if a petitioner has achieved the proper balance among various environmental impacts and among environmental impacts, cost and reliability, the Siting Board determines if the petitioner has provided sufficient information regarding environmental impacts and potential mitigation measures to enable the Siting Board to make such a determination. The Siting Board then determines whether environmental impacts would be minimized. Similarly, the Siting Board evaluates whether the petitioner has provided sufficient cost and reliability information in order to determine if the appropriate balance among environmental impacts, cost and reliability is achieved. Russell 2009, at 28-29; Cape Wind Associates, LLC and Commonwealth Electric Company d/b/a NSTAR Electric, 15 DOMSB 1, EFSB 02-2, at 53 (2005); Cambridge Electric at 24.

Accordingly, the Siting Board examines the environmental impacts, reliability and cost of the proposed facilities along the routes under consideration for approval to determine whether: (1) environmental impacts will be minimized; and (2) an appropriate balance will be achieved among conflicting environmental impacts as well as among environmental impacts, cost and

reliability. In this examination, the Siting Board compares the primary and alternative routes to determine which is superior with respect to providing a reliable energy supply for the Commonwealth with a minimum impact to the environment at the lowest possible cost. Eversource Mystic-East Eagle at 77; Eversource Walpole-Holbrook at 39; Eversource Mystic-Woburn at 33; Russell 2009, at 28.

The Company conducted a comprehensive analysis of the environmental attributes, reliability and costs of the Preferred Route, the Noticed Alternative Route and the Noticed Variation and concluded that the Preferred Route is superior based upon a full consideration of reliability, costs and environmental factors. Therefore, the Company requests that the Siting Board approve the use of the Preferred Route for the Project.

2. Environmental Impact Comparison of the Preferred Route, the Noticed Alternative Route and the Noticed Variation.

The Company evaluated the following environmental factors in comparing the Preferred Route, the Noticed Alternative Route and the Noticed Variation:

(1) public shade trees (Exh. EV-2, at 5-27 to 5-29);

(2) wetland resource areas (Exh. EV-2, at 5-29 to 5-34);

(3) public water supply protection areas (Exh. EV-2, at 5-35 to 5-38);

(4) cold-water fisheries (Exh. EV-2, at 5-39 to 5-42);

(5) wildlife habitat (Exh. EV-2, at 5-42 to 5-47);

(6) state-listed rare species habitat (Exh. EV-2, at 5-47 to 5-51);

(7) residential land uses (Exh. EV-2, at 5-51);

(8) commercial/industrial land uses (Exh. EV-2, at 5-52);

(9) sensitive receptors (Exh. EV-2, at 5-52 to 5-53);

(10) recreational land uses (Exh. EV-2, at 5-54);

(11) conservation land uses (Exh. EV-2, at 5-55 to 5-57);

(12) potential to encounter subsurface contamination (Exh. EV-2, at 5-57 to 5-59);

(13) cultural resources (Exh. EV-2, at 5-59 to 5-61);

(14) visual impacts (Exh. EV-2, at 5-61 to 5-64);

(15) traffic (Exh. EV-2, at 5-64 to 5-69);

(16) construction-related noise (Exh. EV-2, at 5-69 to 5-77); and

(17) EMF (Exh. EV-2, at 5-77 to 5-81).

The Project has the lowest potential for impacts to five out of the ten developed environmental resources: residential land uses, commercial/industrial land uses, sensitive receptors, potential for traffic congestion and construction noise. Exh. EV-2, at 5-82. The Noticed Alternative Route has the lowest potential for impacts to two out of the ten developed resources (cultural resources and visual impacts), but would have the highest potential for impacts to four of the ten developed resource categories (traffic congestion, residential land uses, commercial/industrial land uses and impacts to sensitive receptors). Exh. EV-2, at 5-82. The Noticed Variation would have the highest potential impacts to two of the ten developed resource categories (cultural resources and visual impacts) given that this option requires the most vegetation clearing for construction. Exh. EV-2, at 5-82.

All of the project options traverse areas documented within the MassDEP database of disposal sites identified under the Massachusetts Contingency Plan and, therefore, have the potential to encounter subsurface contamination. Exhs. EV-2, at 5-57 to 5-59, 5-82; EFSB-HW-6(S1)(1). However, through the implementation of the best management practices, the Company concludes that the Project, Noticed Variation and the Noticed Alternative would have equal potential to encounter subsurface contamination. Exh. EV-2, at 5-58, 5-82.

The magnetic field ("MF") levels for the Project, the Noticed Variation and the Noticed Alternative Route are all similar and are all far below national and international guidelines for public exposure to EMF. Exh. EV-2, at 5-82.

Lastly, each of the project options is located adjacent to the same number of recreational uses and, as such, the Company concludes that the Project, Noticed Variation, and Noticed Alternative Route have equal potential to impact recreational land uses. Exh. EV-2, at 5-82.

The Noticed Alternative Route has the lowest potential for impacts to five out of the six natural environmental resources compared: public shade trees, wetland resource areas, coldwater fisheries/wildlife habitat, rare species habitat, and conservation lands. Exh. EV-2, at 5-83. All of the routing options traverse areas identified as public water supply protection areas; however, as explained previously, no impacts to public water supplies are anticipated and all three options are equal for the potential to impact public water supplies. Exh. EV-2, at 5-83.

The Noticed Alternative Route is entirely within public roadways or previously developed areas and would not require substantial removal of vegetation to facilitate construction. Exh. EV-2, at 5-83. Within the MBTA ROW, the Noticed Variation would require the most vegetation removal to facilitate installation, resulting in the greatest amount of impact to the natural environment. Exh. EV-2, at 5-83. The Project would result in less impact to the natural environment along the MBTA ROW compared to the Noticed Variation, given the reduced amount of area needed for construction and ongoing operations and maintenance of an underground transmission line. Exh. EV-2, at 5-83.

Both the Project and the Noticed Variation reuse an existing linear transportation corridor, the inactive MBTA ROW. Exh. EV-2, at 5-83. Moreover, the Project and the Noticed Variation provide an opportunity for the Company to partner with the MBTA and DCR by coupling

construction with the development of the planned regional MCRT, a multi-use path that will be managed by DCR. Exh. EV-2, at 5-83. The multi-use path will bring a number of advantages to users, surrounding communities and the Commonwealth as a whole. Exh. EV-2, at 5-83. In addition, the MCRT traverses the state from west to east and will advance region-wide trail network connections. Exh. EV-2, at 5-83. Cost efficiencies and environmental benefits will be achieved by constructing the Project's access road to serve as the base of the multi-use path and by repurposing the existing bridges.[62] Exh. EV-2, at 5-83. Impacts to the natural environment resulting from construction of the Project would be similar to the impacts resulting from the construction and operation of the planned multi-use path proposed by DCR. Exh. EV-2, at 5-83.

As the Project advances from preliminary design to a final design phase and then transitions into the construction phase, the Company will continue to minimize potential impacts to the natural and developed environments affected. Exh. EV-2, at 5-83. The Project will be designed and constructed to incorporate all necessary best management practices; comply with federal, state, and local rules and regulations; and provide mitigation for any impacts that cannot be avoided. Exh. EV-2, at 5-83.

3. Cost Comparison of the Preferred Route, the Noticed Alternative Route and the Noticed Variation.

Consistent with Siting Board precedent, the Company initially developed conceptual grade cost estimates, with an accuracy of -25% to +50%, for all three options. Exh. EV-2, at 5-84. Conceptual grade estimates include key Project elements, but do not include final engineering detail. Exh. EV-2, at 5-84. Conceptual grade estimates are calculated using recent costs of similar materials and construction activities and include overheads such as costs related to design and

[62] The Noticed Variation would not include rehabilitation of these bridges. Exh. EV-2, at 5-83, n.39.

permitting, and allowance for funds used during construction, but do not incorporate possible future variances in commodity or labor costs. Exh. EV-2, at 5-84. Subsequently, the Company developed a planning grade estimate, with an accuracy of ±25%, for the Project and made certain related adjustments to the cost estimates for the Noticed Variation and Noticed Alternative Routes. Exh. RR-EFSB-50. The cost comparisons of the project options are provided in the table below:

**Total Estimated Cost (millions)**

| Route | Sudbury Substation | Hudson Substation | Transmission Line | Total Project Cost |
|---|---|---|---|---|
| **Project** | **$3.8** | **$5.0** | **$87.0** | **$95.8** |
| **Noticed Variation** | **$3.1** | **$5.0** | **$59.4** | **$67.5** |
| **Noticed Alternative Route** | **$3.9** | **$5.0** | **$105.3** | **$114.2** |

Exh. RR-EFSB-50(1).

4. Reliability Comparison of the Preferred Route, the Noticed Alternative Route and the Noticed Variation.

The Company considered reliability of the Preferred Route, the Noticed Alternative Route and the Noticed Variation and determined that there was no meaningful difference between the operating characteristics for the routes or design variations under consideration. Exh. EV-2, at 5-84. Accordingly, reliability was not a determining factor for route selection. Exh. EV-2, at 5-84.

5. Conclusion on Route Alternatives Comparison

The Preferred Route is less expensive than the Noticed Alternative Route and will result in fewer impacts to the developed environment, because construction will affect fewer residences and businesses and cause less traffic disruption. Exh. EV-2, at 5-85. In comparison to the Preferred Route, while the Noticed Variation would be lower cost, its higher impacts to the natural environment more than offset its cost advantage. Exh. EV-2, at 5-85. For these reasons, the Company concludes that the Preferred Route provides the best balance of impacts to the natural and developed environment by making primary use of a previously developed MBTA ROW, at a

cost nearly $20 million lower than the Noticed Alternative Route, while meeting the identified transmission system need. Exh. EV-2, at 5-85. Further, the Project provides an additional public benefit by advancing the vision of DCR's Mass Central Rail Trail, saving the Commonwealth funds to construct the multi-use path and reducing the overall cumulative environmental impact. Exh. EV-2, at 5-85. Accordingly, the Company requests that the Siting Board approve the use of the Preferred Route for the Project.

### E. The Company Has Appropriately Identified and Proposed Measures to Mitigate Environmental Impacts.

Consistent with Siting Board standards, the Company conducted a detailed analysis of the environmental impacts of the Project and has shown that these impacts are largely temporary in nature and will be minimized to the extent practicable. The Company has thoroughly identified and evaluated a full range of environmental impacts, including construction, wetlands and water resources, historic and cultural resources, traffic and transportation, public shade trees, hazardous waste, visual, EMF, noise, and protected habitats. See, e.g., Exhs. EV-2, at § 5.0; EV-16.

#### 1. Construction

Throughout all phases of construction, the Company and its contractors will follow the procedures outlined in Eversource's BMP Manual. Exhs. EV-2, at 5-9; EV-2, Appendix 5-2 (R-1); Tr. 9, at 1,544-45. In addition to compliance with the Company's BMP Manual, the Company will also ensure that contractors understand and comply with all Project permit conditions or requirements that are established through the permitting process. Exh. EFSB-CM-6. During construction, weekly inspections are performed, and the Company's construction and environmental inspectors will enforce the installation and use of BMPs. Exh. EFSB-CM-6. If a BMP is not followed during construction, work will not be allowed to proceed until the deficiency is corrected. Exh. EFSB-CM-6.

In addition, for all elements of construction work associated with the Project, the Company and its contractors must comply with all applicable federal, state and local safety standards as well as the Company's own safety protocols. Exhs. EFSB-S-1; RR-EFSB-87. Among other particular safety measures, the Company will: (1) stay in close communication with local officials, including Police and Fire Department officials, and abutters; (2) cover all open trenches and post no trespassing signs at the end of each work day; (3) install temporary fencing at roadway crossings to deter unauthorized access during construction; and (4) install temporary fencing around the work site to deter access by unauthorized individuals. Exh. RR-EFSB-87. The Company will work closely with the affected municipalities to determine additional safety measures to be implemented as warranted. Exh. RR-EFSB-87.[63]

Typical mitigation measures, as described more fully below, will further help minimize the potential for temporary impacts to the human and natural environment associated with construction activities.

a. Erosion and Sedimentation Control

As noted above, following vegetation removal activities, erosion and sediment controls such as straw bales, silt fence, or straw wattles will be installed in accordance with Eversource's Massachusetts BMP Manual and with any applicable permit requirements. Exhs. EV-2, at 5-12; EV-2, Appendix 5-2 (R-1); EV-16, at 5-5; Exh. EFSB-W-21; Exh. TOH-ES-4.

b. Air Quality

To minimize the potential for airborne dust from earth disturbing activities, the Company would use one or a combination of BMPs as needed to suppress and control dust. Exh. EV-2, at

[63] With respect to steps the Company plans to take to prevent an increase in ATV use on the MBTA ROW, the Company plans to work with DCR on the most effective manner to keep unauthorized vehicles out of the MBTA corridor, based on DCR's extensive experience with other multi-use trail systems. Exh. EFSB-LU-41.

5-9. Among other measures, Eversource will require its contractors to place water trucks with misters in or near the work areas during construction activities and use them as appropriate. Exhs. EV-2, at 5-9; EV-16, at 13-3. Water sprinkling and street sweeping will be used in combination within the roadway construction areas. Exh. EV-2, at 5-9.[64] Excavated soils will be either directly transferred from the trench to a covered truck or stockpiled and covered with plastic sheeting or a similar barrier to minimize the potential for the release of dust and for soil migration from the work area. Exhs. EV-2, at 5-9; EFSB-LU-5. Soil samples will be collected at a frequency of 1 sample per 500 cubic yards of soil and, based on the laboratory results, the soil will be managed in accordance with relevant criteria set forth in and MassDEP regulations and guidelines. Exh. EFSB-LU-5. The Company will also install anti-tracking pads and regularly sweep adjacent roadway pavement surfaces during the construction period to minimize the potential for construction traffic to kick up dust and particulate matter. Exh. EV-2, at 5-9.

To minimize air emissions from equipment operation, the Company will direct its contractors to retrofit any diesel-powered, non-road construction equipment rated 50 horsepower or above, whose engine is not certified to United States Environmental Protection Agency ("USEPA") Tier 4 standards and that will be used for 30 days or more over the course of the Project, with USEPA-verified (or equivalent) emission control devices (e.g., oxidation catalysts or other comparable technologies). Exh. EV-2, at 5-10. The Company will use ultra-low-sulfur diesel ("ULSD") fuel in its own diesel-powered construction equipment and will require its contractors to do the same for this Project. Exh. EV-2, at 5-10. ULSD has a maximum sulfur content of 15 parts per million compared to 500 parts per million for low-sulfur diesel fuel; thus,

[64] The Company will determine whether water sprinkling is required at roadway construction areas after weekly stormwater pollution prevention plan inspections. Exh. EV-2, at 5-9.

by using ULSD fuel, there is a 97 percent reduction in the sulfur content of the fuel. Exh. EV-2, at 5-10.

The Company and its contractors will comply with state law (G.L. c. 90, § 16A) and MassDEP regulations (310 C.M.R. § 7.11(1)(b)), which limit vehicle idling to no more than five minutes except for vehicles being serviced, vehicles making deliveries that need to keep their engines running, and vehicles that need to run their engines to operate accessories. Exhs. EV-2, at 5-10; EFSB-A-1. In addition, Eversource has a Company-wide idling reduction policy that would apply to all phases of Project construction. Exh. EFSB-A-1. As a general rule, motorized vehicles should not idle unless: (1) using the Power Take Off to run hydraulics – bucket, crane, cable pulling equipment, derrick, tools, winch, pump; (2) using the inverter to power electric tools – crimpers, cutters, pumps, saws, drills, work area lighting, etc.; (3) when the truck is acting as a safety warning signal – emergency lights, traffic lights, warning lights, etc.; and (4) when an engine is being repaired and operating as necessary for the repair. Exh. EFSB-A-1. With respect to enforcement of the idling restrictions, it is the responsibility of every person on a job site to be in full compliance with all safety and environmental rules and polices. Exh. EFSB-A-1. Supervisors and foremen at job sites are responsible for enforcement of these rules on a continuous basis, and environmental inspections will be conducted on a weekly basis. Exh. EFSB-A-1.

Lastly, with respect to other potential air quality impacts associated with the Project, the Project includes the addition of two sulfur hexafluoride ("$SF_6$") insulated circuit breakers at the Sudbury Substation, each containing approximately 80 pounds of $SF_6$ gas by weight. Exh. EFSB-HW-2. The $SF_6$ gas serves as an insulating and interrupting medium in certain substation equipment. Exh. EFSB-A-2. In the event of a release of $SF_6$ gas, there would be no impact to soil or any water body, nor an immediate impact to the air. Exh. EFSB-HW-2. The breakers proposed

for the Project will be specified to have a leak rate of less than or equal to 0.1% per year in compliance with Massachusetts standards (310 C.M.R. § 7.72). Exhs. EFSB-A-2; EFSB-A-3. After completion of the Project, there will be no $SF_6$ stored at Sudbury Substation. Exh. EFSB-A-2.

c. Potential to Encounter Subsurface Contamination

The Company initially performed an online review of the MassDEP database of disposal sites identified under the MCP to determine the potential to encounter subsurface contamination during construction of the Project. Exh. EV-2, at 5-57. Subsequently, the Company has performed a more detailed and comprehensive review through which the Company has identified 35 total sites of concern along the proposed Project route. Exhs. RR-EFSB-66; RR-EFSB-66(1).

To mitigate impacts associated with subsurface contamination, the Company will follow its procedures and BMPs to confirm conditions in the field, develop a comprehensive, site-specific soil and groundwater management plan, and contract with an LSP as necessary, consistent with all applicable requirements of the MCP. Exhs. EV-2, at 5-58 to 5-59; EV-16, at 9-5 to 9-7. If contamination is encountered at concentrations exceeding MCP thresholds, notification will be made to MassDEP. Exhs. EV-16, at 9-5; RR-EFSB-66. Work will then likely be conducted as a Utility-Related Abatement Measure ("URAM") pursuant to 310 C.M.R. § 40.0460 of the MCP, including standard construction precautions consistent with rail trail conversion. Exhs. EV-16, at 9-5; RR-EFSB-66. These precautions would be detailed in the corresponding MCP submittal to MassDEP. Exh. RR-EFSB-66. Should export of these materials be required, proper shipping documentation such as Material Shipping Records, Bills of Lading, and manifests will be prepared. Exh. RR-EFSB-66. MassDEP will be notified, and appropriate risk reduction measures will be taken. Exh. RR-EFSB-66. If further cleanup is necessary, this work will be completed in accordance with the procedures outlined at 310 C.M.R. § 40.0441. Exh. RR-EFSB-66.

d. Hazardous Materials

During construction, hazardous materials that may be used in varying quantities include oils (hydraulic oil), greases (lubricating), and construction equipment fuels (gasoline and diesel). Exh. EFSB-HW-1. Refueling will be completed outside of wetlands and buffer zones to the extent feasible and will not be performed unattended. Exh. EFSB-HW-1. In the unlikely event that one of these substances is released to the environment during construction of the Project (either along the ROW or at Sudbury Substation), spill response will be activated immediately pursuant to the Company's 24-hour-per-day/7-day-per-week response program. Exhs. EFSB-HW-1; EFSB-HW-3; EFSB-HW-3(1). Among other measures, the Company and its contractors are required to have spill kits available always in the event of a release of these substances. Exh. EFSB-HW-1. Spill response will initially include stopping the spill and applying absorbents such as speedy dry and absorbent pads. Exh. EFSB-HW-1. In addition, the Company's spill notification procedure will be activated, and the spilled material and any contaminated material will be contained and cleaned up and properly disposed of. Exh. EFSB-HW-1.[65]

Once the Project is in operation, there are no substances with the potential for negative environmental impacts if leaked or spilled associated with the operation of the New Line. Exh. EFSB-HW-2. Sudbury Substation will, as it does currently, have equipment that contains substances that, if released, may have negative impacts on the environment. Exh. EFSB-HW-2.

[65] Similarly, solid wastes (e.g., packaging, demolition-type debris, steel rails, wooden rail ties, etc.) will be disposed of in accordance with applicable regulations and will not be left behind. Exh. EFSB-HW-4. Materials will be recycled to the extent practicable. Exh. EFSB-HW-4. During normal operation of the Sudbury Substation, there should be no increase in the amount of solid waste generated over the amount presently generated. Exh. EFSB-HW-4. No solid waste will be generated from operation of the New Line. Exh. EFSB-HW-4.

These substances include $SF_6$,[66] gas-insulated switching equipment, electrolytes containing sulfuric acid in batteries,[67] and mineral oil dielectric fluid ("MODF") in the transformers.[68] Exh. EFSB-HW-2. If any materials are released during operation of the Project, the Company's 24/7 response program and spill notification procedures remain in place and will be followed. Exhs. EFSB-HW-2; EFSB-HW-3; EFSB-HW-3(1).

e. Conclusion on Construction Impacts

The Company is committed to minimizing construction-related impacts to the maximum extent possible through the mitigation measures described above. Additional mitigation measures to minimize impacts associated with the Project are discussed further below. Accordingly, the Company has properly minimized construction impacts.

2. Wetland Resource Areas

Wetland resource areas associated with the Project include bordering vegetated wetlands ("BVW"); bordering lands subject to flooding ("BLSF"); 200-foot riverfront areas; vernal pools; and 100-foot Buffer Zones to BVW, banks of perennial and intermittent streams, BLSF and vernal pools. Exh. EV-2, at 5-29 to 5-30. Based on the most current Project design relative to the 2017

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66 In the event of a release of $SF_6$ gas, there would be no impact to soil or any water body, nor an immediate impact to the air. Exh. EFSB-HW-2. The Intergovernmental Panel on Climate Change ("IPCC") has included $SF_6$ as a greenhouse gas; thus, a release of $SF_6$ would be reported as part of the Eversource $SF_6$ Emission Reduction Partnership with the USEPA. Exh. EFSB-HW-2.

67 Sulfuric acid is found as an electrolyte solution in substation batteries that are stored within a closed building at the Sudbury Substation. Exh. EFSB-HW-2. These batteries have an acid-resistant berm containment system containing acid neutralizing pillows, with a minimum capacity to hold the contents of one jar. Exh. EFSB-HW-2. As such, any release of electrolytes would be contained within the building, cleaned up pursuant to the Company's spill response protocol, and not released to the outside environment. Exh. EFSB-HW-2.

68 If there is a release of MODF from a power transformer, the fluid would be contained within the secondary containment structure around the transformer. Exh. EFSB-HW-2. Any MODF not contained, as from a station service transformer, would spill to the ground and be addressed pursuant to the Company's spill response protocol. Exh. EFSB-HW-2. Notably, MODF is not persistent when released to the environment and has a lower toxicity rating than other common petroleum products such as hydraulic fluid and lubrication oils. Exh. EFSB-HW-2. Accordingly, MassDEP has established a Reportable Quantity for Non-PCB MODF at 25 gallons, as opposed to 10 gallons for other oils. Exh. EFSB-HW-2.

wetland delineation line that has been submitted with the Hudson and Sudbury Abbreviated Notice of Resource Area Delineation plan sets, the current alteration amounts based on the Project design have been substantially reduced to the amounts listed below:

- Vegetated Wetlands: 1,179 square feet of permanent fill from grading;
- Inland Bank: 52 linear feet of permanent impact from grading and replacement of a section of culvert;
- Land Under Water: 53 square feet of permanent impact from grading and replacement of a section of culvert;
- Riverfront Area: 170,122 square feet of land disturbance from grading (66,772 square feet in Hudson; 103,350 square feet in Sudbury);
- 100-foot Buffer Zone: 464,292 square feet of disturbance from grading; and
- Vernal Pools: No impacts.[69]

Exhs. RR-SUD-10; RR-SUD-10(1); RR-SUD-10(2); EFSB-EIR-28; EFSB-EIR-28(1); EFSB-EIR-28(S1); EFSB-EIR-28(S1)(1).[70] With respect to BLSF, the Company remains committed to designing the Project to either avoid fill in floodplain elevations or to include compensatory flood storage on-site where necessary. Exhs. SUD-DEIR-30; RR-SUD-10.

Although there are BVWs and Buffer Zones along the public roadway portion of the Project, no impacts would be anticipated from construction of the Project within the existing pavement, and proper implementation of BMPs would protect these resources during construction. Exh. EV-2, at 5-32.

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69 The closest vernal pool to Project construction is approximately three feet from the limit of grading. Exh. EFSB-EIR-31.

70 As Project design and engineering has advanced, the Company has been able to further avoid and minimize impacts to wetland resource areas by designing the Project limits of work outside of wetlands or by implementing design features such as retaining walls and rip rap slopes. Exh. EFSB-EIR-29. Thus, the Company's estimated impacts to wetland resources have been reduced significantly since the filing of the Company's Initial Petition in this proceeding and the filing of the Environmental Notification Form ("ENF") with MEPA. Exh. EFSB-EIR-29.

The Company will minimize impacts to wetland resource areas through several measures. First and foremost, the Company will design the placement of the access road and duct bank associated with the Project outside of these resource areas whenever possible. Exh. EV-2, at 5-33. During construction, wetland resources will be protected by the installation of appropriate erosion and sedimentation BMPs. Exh. EV-2, at 5-33. For any unavoidable impacts, the Company will work with the United States Army Corps of Engineers ("USACE"), MassDEP, Massachusetts Natural Heritage and Endangered Species Program ("NHESP"), and local conservation commissions to develop the necessary compensatory mitigation plans. Exh. EV-2, at 5-33. Such mitigation plans could include, but not be limited to the following:

- USACE New England District Compensatory Mitigation Guidance (2016) recommends that proposed mitigation provide compensation at a ratio of at least 2:1 and up to 20:1 depending on the type of resource areas impacted and the mitigation approach proposed (restoration, creation, rehabilitation, and/or preservation).
- Massachusetts Water Quality Certification Regulations require a minimum of 1:1 restoration or replication for discharges to bordering vegetated wetlands.
- Massachusetts Wetlands Protection Act ("MWPA") Regulations prescribe certain performance standards for impacts within different resource areas, including creation of BVW at a 1:1 ratio to mitigate for any permanent fill and for the creation of compensatory flood storage for any permanent fill within BLSF.
- Local bylaws: Stow and Sudbury both have local wetlands protection bylaws that prescribe certain performance standards for impacts within different resource areas and that and may require additional mitigation beyond what is prescribed in the MWPA regulations.

Exh. EV-2, at 5-33. Final details regarding the overall wetland-related mitigation approach will be determined when final design is complete. Exh. EV-2, at 5-33. Mitigation plans will be included in the various permit applications to be submitted to local, state, and federal regulatory agencies for review, and the permits issued will contain conditions specifying the mitigation required. Exh. EV-2, at 5-33. During the final design phase of the Project, once all impacts to wetlands from the Project have been avoided or minimized to the extent practicable, the Company

will consult with the USACE, MassDEP and the local conservation commissions to determine a final mitigation approach for the Project with each agency. Exh. EFSB-W-9.

Based on the foregoing, the Company has minimized impacts to wetland resource areas.

3. Public Water Supply Protection Areas

Public water supply protection areas within the vicinity of the Project consist of Zone I and Zone II Wellhead Protection Areas ("WPAs"), both regulated by the MassDEP, as well as water supply protection overlay districts that are regulated by local zoning authorities. Exhs. EV-2, at 5-35; EV-16, at 8-1. A Zone I WPA is the protective 400-foot radius required around a public water supply well or wellfield. Exhs. EV-2, at 5-35; EV-16, at 8-1 to 8-2. Zone II WPAs are those portions of an aquifer that contribute to the recharge of an existing public water supply well or wellfield. Exhs. EV-2, at 5-35; EV-16, at 8-2. Water supply protection overlay districts are regions that are important to the recharge of local water supply sources. Exh. EV-2, at 5-35. In total, the Project traverses approximately 6.49 miles of public water supply protection areas, including three Zone II WPAs (two Zone II WPAs in Hudson and one Zone II WPA in Sudbury) and three local water supply protection overlay districts in both Sudbury and Hudson. Exhs. EV-2, at 5-35; EV-16, at 8-2. The Project does not pass within any Zone I WPAs. Exh. EV-16, at 8-2. There are also no private drinking water wells within 100 feet of the MBTA ROW. Exh. EV-16, at 8-2.

The Company hired a professional hydrogeologist, who is a Certified Ground Water Professional ("CGWP"), to complete detailed Groundwater Hydrology Assessments for the potential for the proposed Project to affect the flow and quantity of water to public water supply wells in Sudbury and Hudson. Exhs. EV-2, at 5-35, Appendices 5-6 and 5-7; EV-16, Appendices 8-1 and 8-2. As concluded in the Groundwater Hydrology Assessments, the installation of the Project will not have any appreciable impact on groundwater flow or public water supply well

yields in either Sudbury or Hudson. Exhs. EV-2, at 5-35; EV-16, at 8-3; Tr. 10, at 1,661. Most of the Project would be installed above the elevation of the groundwater surface, where it would not be possible to have any effect on groundwater flow rates or directions. Exh. EV-16, at 8-3. Project components located deeper underground, such as splice vaults, would extend into the water table in a few locations; however, they would not significantly alter flow rates or directions because construction would enter only a small fraction of the aquifer, which is highly permeable, allowing groundwater to flow under and around the splice vaults in the same rates and directions it does presently. Exh. EV-16, at 8-3. Furthermore, the design of the New Line will not involve any circulating coolant or other potential liquid contaminants. Exh. EV-2, at 5-35.

To ensure that there are no impacts to public water supplies during construction of the Project, Eversource will develop and implement a Storm Water Pollution Prevention Plan ("SWPPP") that includes spill protection controls and counter measures to ensure that there are no impacts to groundwater in the event of a spill during construction. Exh. EV-2, at 5-35 to 5-36. The Company will prepare and implement the SWPPP in accordance with the Company's BMPs, as well as the USEPA's National Pollutant Discharge Elimination System Construction General Permit. Exhs. EV-2, at 5-35 to 5-36; EFSB-W-4.[71] In addition, Eversource will require its contractors to use equipment that has been properly maintained to reduce the risk of a spill. Exh. EV-2, at 5-37. Contractors will also be required to have spill containment and prevention devices (e.g., drip pans, absorbent pads, etc.) accessible to crews at each work location. Exh. EV-2, at 5-37. The Company will require its contractors to adhere to its BMPs, including those relative to the storage and handling of oils, lubricants, and other chemicals during construction. Exh. EV-2,

[71] The final SWPPP document will be completed following selection of a contractor and filed with the USEPA one to two months prior to the start of construction. Exh. EFSB-W-4.

at 5-37. Other than equipment that is not readily mobile, equipment will not be refueled or maintained within wetland resource areas and equipment/material storage will not be permitted within 100 feet of any wetland or waterbody. Exh. EV-2, at 5-37. Contractor staging areas and contractor yards typically will be located at existing developed areas (such as parking lots), where the storage of construction materials and equipment, including fuels and lubricants, will not conflict with protection of public surface water supplies or wetland resources. Exh. EV-2, at 5-37. Accordingly, the Company has taken steps to properly minimize impacts to public water supply resource areas during construction of the Project.

Following construction of the Project, the Company expects that vegetation management will be carried out by DCR and will conform to the DCR Manual and all applicable regulatory standards for aquifer protection areas to ensure that there are no impacts to public water supplies during operation of the Project. Exhs. EV-2, at 5-35 to 5-37; EFSB-LU-11; EFSB-LU-11(1).

Accordingly, the Company has minimized impacts to public water supply areas.

4. Coldwater Fisheries

The MWPA Regulations (310 C.M.R. § 10.04(a)) define a coldwater fishery as "waters in which the mean of the maximum daily temperature over a seven-day period generally does not exceed 68ºF (20ºC), and when other ecological factors are favorable (such as habitat) and are capable of supporting a year-round population of coldwater stenothermal aquatic life, such as trout." Exh. EV-2, at 5-39. Waters designated as coldwater fisheries by the MassDEP are listed in 314 C.M.R. 4.00: Massachusetts Surface Water Quality Standards. Exh. EV-2, at 5-39. The Massachusetts Division of Fisheries and Wildlife ("DFW") also designates waters as coldwater fishery resources when there is evidence, based on a fish survey, that a coldwater fish population and suitable habitat exists. Exh. EV-2, at 5-39. Streamside vegetation provides nutrients, bank stabilization, and cover for fish and helps to keep the water shaded and cool enough to maintain

suitable temperatures for coldwater fisheries. Exh. EV-2, at 5-39. Coldwater fish species include, but are not limited to, brook trout (*Salvelinus fontanilis*), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), creek chubsucker (*Erimyzon oblongus*), and fallfish (*Semotilus corporalis*). Exh. EV-2, at 5-39.

The Project along the MBTA ROW crosses a coldwater fishery associated with Hop Brook in two locations (both in Sudbury): (1) approximately 1,300 feet southeast of the crossing at Boston Post Road (Route 20); and (2) approximately 1,600 feet west of the crossing at Dutton Road. Exhs. EV-2, at 5-39; EV-16, at 6-3. There will be some tree clearing along the banks at each crossing, but there will be no grading required on the banks because the existing bridge crossings at each location can be reused with some minor upgrades to bridge components above the existing abutments. Exh. EV-16, at 6-3. Low-growing woody vegetation along the stream banks will be preserved to the extent practicable to ensure bank stability. Exh. EV-16, at 6-3. No work is necessary within Hop Brook itself. Exhs. EV-16, at 6-3; EV-16, at Appendix 2-5.

As bridge design is finalized, the Company will work to minimize tree clearing along the banks of Hop Brook. Exh. EV-16, at 6-3. The Company will also follow the Wildlife Habitat Protection Guidance for Inland Wetlands to complete detailed wildlife habitat evaluations at proposed impact areas to inland bank to identify key habitat features and to develop an appropriate avoidance and restoration plan for the Project at these locations. Exh. EV-16, at 6-3. As required, the Company will design the Project to comply with the Massachusetts Stormwater Policy (Standard 6) for work that could affect "Critical Area" coldwater fisheries and any applicable standards in the Sudbury Stormwater Management Bylaw Regulations, to the maximum extent possible. Exh. EV-16, at 6-3. To address the Sudbury standards in particular, among other design elements, the Company will: (1) minimize tree removal within 80 feet of the top of the bank of

Hop Brook at both crossing locations; (2) develop a restoration plan to restore forested vegetation at these locations; (3) retain tree canopy along the stream banks to the maximum extent possible while facilitating safe installation of the Project; (4) minimize disturbance to logs, stumps and other large woody debris in or overhanging the water; (5) re-use the existing abutments and bridge structures at both crossings; and (6) avoid any in-stream work. Exh. EFSB-EIR-4.

Implementation of appropriate BMPs will mitigate the risk for the potential of erosion and deposition of sediment into the brook. Exhs. EV-2, at 5-41; EV-16, at 6-4. Maintenance of the ROW following standard vegetation management practices and adherence to applicable state and federal requirements will be protective of water quality concerns and coldwater fisheries. Exhs. EV-2, at 5-41; EV-16, at 6-4. In addition, the Company will comply with the applicable performance standards in the MWPA regulations and the Massachusetts Surface Water Quality Standards during construction and maintenance of the Project. Exh. EV-2, at 5-41. A detailed Stormwater Pollution and Prevention Plan will be developed that will prescribe erosion control, construction sequencing and other BMPs to be implemented at these crossings. Exh. EV-16, at 6-4. Where appropriate, the Company will assess potential impacts to coldwater fisheries and propose replantings to maintain shading where possible. Exhs. EV-2, at 5-41; EV-16, at 6-4.

For the foregoing reasons, the Company has minimized impacts to coldwater fisheries.

5. Wildlife Habitat

The Project as proposed will traverse land areas containing vegetative cover types that provide wildlife habitat for a variety of species. Exh. EV-2, at 5-42. Habitat areas through which the Project is proposed to traverse include pasture/hay fields, scrub/shrub, deciduous forest, mixed forest, evergreen forest, and wetlands. Exh. EV-2, at 5-42. Although there are a variety of habitat areas along the Project route, the primary impacts to wildlife habitat associated with the Project will be related to the required clearing of forested areas (deciduous, mixed, and evergreen,

collectively). Exh. EV-2, at 5-42. The MBTA ROW is an inactive transportation corridor. Tr. 5 at 752. Properties adjacent to the MBTA ROW route are a mix of developed and undeveloped areas. Exh. EV-2, at 5-43. The largest of the undeveloped areas is associated with protected open space areas that abut the MBTA ROW and include lands held or managed by the Town of Sudbury, the City of Marlborough, the Sudbury Valley Trustees ("SVT"), and the U.S. Fish and Wildlife Service ("USFWS"). Exh. EV-2, at 5-43; Tr. 9 at 1520.[72] These areas include important pitch pine-oak habitat within and adjacent to portions of the MBTA ROW. Exhs. EV-2, at 5-43; EFSB-LU-12; EFSB-LU-24; EFSB-LU-25; EFSB-LU-25(1).[73] In total, approximately 27.96 acres of tree removal from the MBTA ROW will be necessary for the Project. Exhs. EV-2, at 5-44; EV-16, at 5-2; SUD-DEIR-47.[74] This amount of tree clearing would be less if the rail trail were developed prior to the Project. Exh. EFSB-LU-15. Indeed, assuming that DCR would require clearing of its entire 19-foot-wide leased rail trail corridor, this would result in approximately 17.39 acres of tree clearing as compared with the 27.96 acres of tree clearing proposed for the Project based on current levels of design. Exh. RR-EFSB-62.

In general, transmission line ROWs can have both beneficial and detrimental ecological effects on the areas they traverse. Exhs. EV-2, at 5-44 to 5-46; SUD-WH-4. New edge habitat can be a benefit to some species (such as deer) that live in or use early successional habitat. Exhs.

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72 The Project route is located on the MBTA ROW, which does not include Article 97 lands. Exh. RR-EFSB-65(1).

73 In some portions of the MBTA ROW to be used for the Project, there are existing pathways and trails currently used for hiking, running, dog walking, horse riding, and mountain biking. Exh. EV-2, at 5-43. Evidence of off-road vehicle use is evident in some locations as well. Exh. EV-2, at 5-43. Public use of the MBTA ROW is most apparent west of Dutton Road in Sudbury through Parmenter Road in Hudson. Exh. EV-2, at 5-43.

74 Within this total, the Project will involve 0.17 acres of tree clearing within vegetated wetland resource areas (Bordering Vegetated Wetland and Isolated Vegetated Wetland), 12.29 acres of tree clearing within 100-foot Buffer Zone, 0.21 acres of tree clearing within Bordering Land Subject to Flooding, and 0.94 acres of tree clearing within 200-foot Riverfront Area (including Riverfront Areas to two crossings of Hop Brook that have been designated as Cold Water Fisheries). Exh. SUD-DEIR-47. Note that these clearing amounts in particular resource areas overlap and therefore cannot be added together to arrive at a total acreage. Exh. SUD-DEIR-47.

EV-2, at 5-44; EFSB-LU-22. Typical ROW vegetation management practices for electric transmission corridors encourage the development of tree-free habitats dominated by scrub-shrub and/or herbaceous habitats. Exh. EV-2, at 5-44 to 5-45. The removal of the railroad tracks within the MBTA Corridor would also provide some value for amphibians and reptile species that may have difficulty crossing the tracks. Exh. EV-2, at 5-45. However, while ROW corridors can afford increased connectivity and movement by animals and humans for management and recreation purposes, such connectivity can also facilitate the spread of invasive species into areas previously inaccessible. Exh. EV-2, at 5-45.[75] Similarly, increased edge habitat has also been associated with negative effects such as brood parasitism from brown-headed cowbirds and predation of song bird nests. Exh. EV-2, at 5-45.

For the Project, as noted above, the Company expects that DCR will ultimately carry out maintenance activities in conformance with the DCR Manual where applicable and all applicable state and federal permitting conditions and laws. Exhs. EV-2, at 5-45; EFSB-LU-11; EFSB-LU-11(1); SUD-G-20(S3)(1). At the same time, the Company is committed to continued discussions to explore the potential to work cooperatively with the SVT, USFWS, DCR and the local land management agencies to develop a vegetation management strategy that promotes and helps achieve the current habitat management goals along the MBTA ROW and that is compatible with the safe operation and maintenance of the New Line. Exh. EV-2, at 5-45. Ultimately, the Project will be designed such that there will be no barriers to wildlife movement. Exh. EV-16, at 2-28. In addition, as Project design advances, the Company will follow the Wildlife Habitat Protection

[75] The Company uses several practices to minimize the spread of invasive species. Exh. EFSB-LU-32. Seed-free erosion controls are used (e.g., straw bales, straw wattles and mulch). Exh. EFSB-LU-32. Soil stabilization and restoration are done with weed-free seed mix. Exh. EFSB-LU-32. In addition, vehicles and equipment used for construction will be cleaned each day prior to entering the ROW to reduce the transport of off-site seed. Exh. EFSB-LU-32.

Guidance for Inland Wetlands and will complete detailed wildlife habitat evaluations at proposed impact areas to identify key habitat features and to develop an appropriate avoidance and restoration plan for the Project. Exh. EV-16, at 2-28.

Thus, the Company has minimized impacts to wildlife habitat.

6. State-Listed Rare Species Habitat

The NHESP released the 14th Edition of the Natural Heritage Atlas on August 1, 2017. Exh. EV-16, at 7-2. The Company submitted a formal information request to NHESP to identify changes to rare species habitat mapping that apply to the Project. Exh. EV-16, at 7-2. Based on the updated mapping and response from NHESP, the Project is no longer located in the two priority/estimated habitats initially identified in the Company's ENF. Exhs. EV-16, at 7-2; EV-16, at Appendix 7-1; Tr. 9, at 1,415-16. Rather, the Project now passes through one priority/estimated habitat area. Exh. EV-16, at 7-2. The area was identified as priority/estimated habitat for Eastern Box Turtle, Eastern Whip-poor-will, Gerhard's Underwing Moth, and Coastal Swamp Metritis Moth. Exhs. EV-16, at 7-2; EFSB-LU-7(S-1)(1); EFSB-LU-21(S-1).[76]

The Company anticipates a permanent loss of habitat of approximately 2.1 acres from the 14-foot access road and approximately 4.54 acres of habitat conversion (forested to shrub/herbaceous). Exh. EV-16, at 2-7. Based on discussions with NHESP, the Company has initiated field studies to identify Eastern Box Turtles within this area. Exhs. EV-16, at 7-2; EFSB-EIR-15. To date, NHESP has not indicated whether a take of rare species is likely to occur. Exh.

[76] The Company has consulted with the United States Fish and Wildlife Service ("USFWS") and the Massachusetts NHESP related to federally-listed species and concluded that the Project is within areas mapped by the USFWS as potential northern long-eared bat ("NLEB") habitat. Exh. EFSB-LU-8. Consultation with the USFWS and the NHESP is required to show compliance with Section 7 of the federal Endangered Species Act, and as part of the USACE General Permit under Section 404 of the federal Clean Water Act permitting process. Exh. EFSB-LU-8. According to NHESP mapping, there are no known NLEB maternity roost trees or hibernacula within 0.25 miles of the Project. Exhs. EFSB-LU-8; EFSB-LU-8(2).

EV-16, at 7-2. The Company currently expects the submission of a Massachusetts Endangered Species Act ("MESA") Project Review Checklist to NHESP in April 2018. Exh. EV-16, at 7-2.

Following construction of the Project, it is anticipated that the MBTA ROW will continue to offer suitable habitat for these species as the tree clearing and ongoing vegetation maintenance along the MBTA ROW would be considered habitat conversion rather than habitat loss. Exhs. EV-2, at 5-50; EFSB-LU-21. Notably, once the rail is removed, there would no longer be a physical barrier to movement for the reptiles like the Eastern Box Turtle in the area. Exh. EV-16, at 7-5.

To properly mitigate potential impacts to state-listed rare species habitat, the Company will work with NHESP staff through the MESA review process to identify appropriate protection plans for each state-listed rare species that may be required. Exhs. EV-2, at 5-50; EV-16, at 7-6. These protection plans will focus on minimizing direct mortality of state-listed species that may be present within the MBTA ROW during construction. Exhs. EV-2, at 5-50; EV-16, at 7-6. Impact minimization measures could include time-of-year restrictions for construction, use of temporary exclusionary barriers, and wildlife clearing surveys conducted daily by qualified biologists in advance of construction. Exhs. EV-2, at 5-50; EV-16, at 7-6.

To further the Company's plan to provide the best suitable habitat possible for wildlife along the corridor after construction, the Company: (1) has minimized the width of the maintained corridor; (2) is promoting the growth of native plant species and removing the railroad track; and (3) is consulting with protected-land managers and local, state and federal agencies. Exhs. EV-16, at 7-6; EFSB-LU-21. If NHESP staff determines that construction along the MBTA ROW would result in a "take," then the Company will file for and meet the performance standards for the issuance of a Conservation Management Permit ("CMP"). Exhs. EV-2, at 5-50; EV-16, at 7-

6. Typical mitigation options under a CMP may include offsite habitat protection or funding of programs that directly benefit the affected species. Exhs. EV-2, at 5-50; EV-16, at 7-6. Offsite habitat protection typically requires the acquisition of land, under fee ownership or conservation restriction, for permanent habitat conservation. Exhs. EV-2, at 5-50; EV-16, at 7-6. Other mitigation options consist of financial contribution toward land acquisition, conservation research funding, habitat management, or other programs that directly benefit the affected species. Exhs. EV-2, at 5-50; EV-16, at 7-6.

Accordingly, the Company has properly minimized impacts to rare species.

7. Public Shade Trees

Public shade trees are subject to protection under G.L. c. 87, which is administered by locally-appointed Tree Wardens in each municipality when shade trees are located within public roadways, or by MassDOT when located within state-controlled roadways. Exh. EV-2, at 5-27. To construct the Project, an estimated 12 shade trees would need to be removed. Exh. EV-2, at 5-28. All 12 of these public shade trees are at locations where the MBTA ROW intersects public roadways in areas where tree clearing is required. Exh. EV-2, at 5-28. As currently designed, the portion of the Project to be located within public roadways is intended to be installed within the limits of the paved roadways and is not anticipated to result in the need to cut any public shade tree. Exh. EV-2, at 5-28; Tr. 13, at 2443.

As required by G.L. c. 87, should the Company need to remove any public shade trees, the Company would obtain a permit from the relevant Tree Warden or MassDOT, as applicable, in each municipality and work with the Tree Warden/MassDOT to identify appropriate mitigation. Exh. EV-2, at 5-28. In addition, the Company will implement the following practices to protect public shade trees: (1) erect and maintain a temporary protective fence (to be removed when construction is complete) around the perimeter of individual tree pits (the area between the curb

or sidewalk where the tree resides); (2) if excavation for new construction is required within the tree pit area or sidewalk, the Tree Warden will be contacted before any work begins to review whether the contractor may commence with the work or if a qualified arborist must be hired to conduct root pruning; (3) trees will be repaired or replaced in a manner approved by the Tree Warden at the Company's expense. Exhs. EV-2, at 5-29; EFSB-V-1. Impacts to public shade trees will therefore be minimized.

8. Historic and Cultural Resources

The Company has endeavored to identify known historic and archaeological resources in the Project area. Exh. EV-16, at 12-1. Among other steps, the Company has reviewed a list of historic and archaeological properties identified in the MACRIS database and inventory of the Massachusetts Historical Commission ("MHC"), as well as enlisted the Commonwealth Heritage Group, Inc. ("CHG") to conduct field-based, reconnaissance-level historic and archaeological surveys of the Project area. Exhs. EFSB-EIR-20; EFSB-EIR-21; RR-EFSB-58; RR-EFSB-58(1); RR-EFSB-58(2).[77] Although the clearing of trees could in some locations affect the viewshed from certain historic districts or historic properties, the Company expects that the existing vegetation would continue to provide a visual buffer from most abutting land uses. Exh. EV-16, at 12-2; Tr. 9, at 1,469-70.

The Company will coordinate with the Army Corps of Engineers ("ACOE") and the MHC to avoid or minimize adverse effects to any eligible historic resource and to archaeological

[77] CHG conducted background research to determine the presence of previously-identified historic properties within 0.25 miles of the Project and a field reconnaissance to confirm the results of background research, as well as to determine the presence of other historic properties that could be affected by the Project. Exh. EFSB-EIR-21. CHG also conducted archaeological field reconnaissance of the Project route including 40 feet to either side of the rail-bed centerline. Exh. EFSB-EIR-21. Special attention was given to areas of natural topography within 40 feet to either side of the inactive rail bed, the presence of wetlands, soil characteristics along the route, and extant historic railroad features such as granite mile markers and former station sites. Exh. EFSB-EIR-21.

resources. Exh. EV-16, at 12-3. As part of the ACOE's Section 404 permit review, and pursuant to Section 106, the federal agency will also consult with Native American Tribes that express an interest in the cultural resources that may be affected by those portions of the Project route that is subject to ACOE and MHC jurisdiction. Exh. EV-16, at 12-3. The Company will continue to coordinate with MHC and local historic commissions through the MEPA process. Exhs. EV-16, at 12-3; EFSB-LU-35. The Company will take measures to avoid historic or archaeological resources, where practical, as the Project design advances. Exh. EFSB-EIR-22. If resources cannot be avoided, specific minimization and mitigation measures will be established through consultation with the ACOE, the MHC, and other consulting parties, and may include research, photography, archaeological testing, and preparation of an interpretative panel. Exh. EFSB-EIR-22.

For these reasons, impacts to historic and archaeological resources have been minimized.

9. Visual Impacts

Because the Project is proposed as an underground transmission line, no visible above-ground features would be installed within the ROW. Exh. EV-2, at 5-62. The primary visual impact associated with the Project will result from the tree clearing along the MBTA ROW. Exhs. EV-2, at 5-61; EV-2, Appendix 5-7. Along the proposed Project route, the average amount of tree buffer that currently exists between the residential property line of the average residential abutter and the centerline/railroad bed is 40 feet. Exh. EFSB-V-8. Following tree clearing activities, the average remaining tree buffer between the residential property line at the MBTA ROW property

line and the centerline/railroad bed will be 23.5 feet. Exh. EFSB-V-8.[78] In most locations, the existing vegetation would continue to provide a visual buffer from abutting land uses, though the cleared portion of the MBTA ROW would be visible at road crossings. Exh. EV-2, at 5-62.

With respect to incremental visual impacts associated with the Project at the existing Sudbury Substation, the structures that will be added to Sudbury Substation are similar in height to existing facilities. Exh. EFSB-V-4. Consequently, the visual impacts of the additional structures will be minimal because the new structures will be integrated with similar existing structures within the Substation and shielded to the extent possible by the existing vegetative buffer at the Substation. Exhs. EFSB-V-4; EFSB-V-4(1) through (5).[79] Additional lighting will be required for the breaker and line terminal disconnect switches. Exh. EFSB-V-3. Added lighting is also required for the equipment, disconnect switches and breakers associated with the proposed shunt reactor and relocated capacitor bank. Exh. EFSB-V-3. This additional lighting, consistent with existing lighting at Sudbury Substation, is task-oriented lighting that illuminates the equipment at ground level as well as the overhead disconnect switches. Exh. EFSB-V-3. This lighting is kept on only when there is night work in the station or in connection with a request from law enforcement agencies. Exh. EFSB-V-3.

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78 There are some areas along the MBTA ROW where the remaining tree buffer after construction of the Project will be less than 23.5 feet. Exhs. RR-EFSB-93; RR-EFSB-93(1). However, in all the residential locations, there is additional vegetation on the adjacent property that would provide a visual buffer even when the buffer on the ROW will be less than 23.5 feet. Exhs. RR-EFSB-93; RR-EFSB-93(1). At many of the commercial/industrial locations, there is already much less than 23.5 feet of existing vegetative buffer between the adjacent property boundary and the existing rail, and the proposed conditions would not materially alter existing conditions. Exhs. RR-EFSB-93; RR-EFSB-93(1).

79 The Substation is, except for where the existing ROW emerges at the northeast and southwest portions of the Substation site, surrounded by trees that will be unaffected by the Project. Exh. EFSB-V-4. Trees immediately surrounding the Substation were measured to be approximately 60 feet high and lower shrub vegetation was measured to be between 10 and 18 feet high. Exh. EFSB-V-4.

To mitigate visual impacts associated with the Project, the Company will work with those abutting landowners that experience a material change in view of the MBTA ROW because of the construction to determine reasonable and practical screening that could be provided on their properties, provided such landscaping options do not interfere with the safe and reliable operation of the Project. Exhs. EV-2, at 5-63; EFSB-V-2; Tr. 13, at 2, 444-45. Screening options may be in "soft" form (e.g., vegetation), or "hard" form (e.g., fencing), or a combination of the two. Exhs. EV-2, at 5-63; EFSB-V-2; EFSB-V-9; EFSB-LU-3. The Company will work with property owners on an individualized basis. Exh. EFSB-V-2. In addition, the Company will work cooperatively with the municipalities, DCR and the MBTA to advance the details of a landscaping plan within the MBTA ROW occupied by the Project that is compatible with both the multi-use path and the installed transmission line.[80] Exhs. EV-2, at 5-63 to 5-64; EFSB-V-2.

Based on the foregoing, the Company has minimized the visual impact of the Project.

10. Traffic and Transportation Impacts

Most of the Project route (7.61 miles, or 84% of the overall 9.01-mile proposed route) is along the MBTA ROW where, except for ten roadway crossings, construction would be occurring off road with no impacts on traffic. Exh. EV-2, at 5-65. The remainder of the Project route is along roadways with low traffic volumes (Wilkins Street and Forest Avenue). Exh. EV-2, at 5-65. With respect to the ten roadway crossings along the MBTA ROW portion of the Project route, crossings with narrow widths (Union Avenue, Horse Pond Road, Peakham Road and Dutton Road in Sudbury; and White Pond Road and Chestnut Street in Hudson) will likely require a temporary road closure and traffic detour. Exhs. EV-2, at 5-65; EV-16, at 11-1; EFSB-T-5. Crossings with

[80] In accordance with DCR's ENF, the Company anticipates that DCR will be responsible for the development of landscaping plans. Exh. EFSB-LU-36(1) at A-51.

road widths that allow two-way alternating traffic (Landham Road and Boston Post Road (Route 20) in Sudbury and Parmenter Road and Main Street in Hudson) will require the crossing to be constructed in two stages to allow for one lane of traffic to be open at a time. Exhs. EV-2, at 5-65 to 5-66; EV-16, at 11-2; EFSB-T-5. In addition, MassDOT may require night work when crossing Route 20, and the Town of Hudson may also require night work in portions of Main Street to minimize traffic congestion during peak traffic hours and avoid potential business interruptions. Exhs. EV-16, at 11-2; EFSB-T-11; Tr. 11, at 1976-1977.

Once the Company reaches a more advanced level of the Project design, a detailed analysis of the work zone along all roadway segments of the Project route will be performed, including the common linear in-road portion of the Project, and whether detours would be required or whether two-way alternating traffic could be maintained. Tr. 14, at 2,504-05; Exhs. RR-EFSB-32; RR-EFSB-32(1). Nonetheless, based upon the Company's current understanding of the Project route, the Company expects that a minimum of one lane of alternating traffic patterns will be maintained on most roadways for the Project route. Exhs. EV-16, at 11-1; EFSB-T-5. If detours are necessary, they will be closely coordinated with the affected municipality, as well as area stakeholders. Exh. EFSB-T-5.[81]

The Company is committed to minimizing and mitigating traffic impacts associated with Project construction to the maximum extent practicable. The Company will carefully coordinate construction to minimize impacts to adjacent residences and businesses and others relying on these transportation corridors. Exhs. EV-2, at 5-67; EV-16, at 11-2. Among other measures, the Company is developing an extensive outreach plan for ongoing communications to local residents,

[81] Any closure and detour of local roadways would take place during off-peak traffic hours, as determined by the agency or municipality with jurisdiction over the roadway as part of the street opening permit process, with full roadway access restored during non-working hours. Exh. EFSB-EIR-12.

business owners and local officials through the Project construction period. Exhs. EFSB-T-1; EFSB-T-2. Prior to beginning construction, the Company will work closely with the municipalities and MassDOT to develop construction Traffic Management Plans ("TMPs") to minimize the impacts of construction on the traveling public. Exhs. EV-2, at 5-67; EFSB-T-3; Tr. 14, at 2,502-03. The TMPs will be developed consistent with the Federal Highway Administration's *Manual on Uniform Traffic Control Devices for Street and Highways* and MassDOT's publication, *Work Zone Safety*. Exhs. EV-2, at 5-68; EFSB-S-1. Issues to be addressed in the TMPs or the outreach plan include:

- Ongoing coordination with police and fire departments;
- Provisions for emergency vehicle access;
- Timing and delivery of equipment and materials;
- Lane location and width within the work zone to minimize impacts to vehicular traffic movement and promote safe passage;
- Work schedule and duration of proposed lane closures, alternating traffic flow patterns, road closures, and detours (where necessary);
- Traffic-control devices such as barricades, reflective barriers, advance warning signs, traffic regulation signs, traffic control drums, flashers, detour signs, and other protective devices as approved by the applicable municipalities;
- Locations where temporary provisions may be made to maintain access to homes and businesses;
- Routing and safeguarding of pedestrian and bicycle traffic;
- Continuity plans along school bus and private motor coach routes;
- Method of communication with adjacent businesses to avoid interruptions to critical product deliveries;
- Roadway level of service effects due to short-term lane closure(s); and
- Development of a system to notify municipal officials, local businesses, and the public of the timing and duration of travel restrictions.

Exhs. EV-2, at 5-68; EV-16, at 11-2.

The TMPs will be submitted for MassDOT and municipal review and approval as part of the permit process by appropriate MassDOT, Hudson, Sudbury and Stow authorities prior to the start of in-street construction. Exhs. EV-2, at 5-68; EV-16, at 11-2. The Company is committed to working closely with the host communities, local businesses and residents to minimize traffic impacts from the Project to the maximum extent possible through the mitigation measures described above. Accordingly, the Project will properly minimize traffic impacts.

11. Sound Level Impacts

The sound level impacts associated with the Project will be limited to localized, short-term increases in ambient noise levels near work sites during construction. Exh. EV-2, at 5-69. Construction-related noise will occur because of the operation of equipment and vehicles, including vegetation removal equipment, jackhammers, drilling rigs and cranes. Exh. EV-2, at 5-69. The potential for noise impacts from construction activities depends on the construction equipment used for each phase of construction and the specific construction activity. Exh. EV-2, at 5-70.

Sound levels from typical construction equipment that will be used during construction of the Project are listed in the table below. As illustrated in the table, below, sound levels range from 60 dBA to 90 dBA at a distance of 50 feet from the construction activity. Exhs. EV-2, at 5-71; EV-16, at 13-5. The only residential dwelling located within 50 feet of the limit of work for the Project along the MBTA ROW is located 34 feet away. Exhs. EV-2, at 5-71; EV-16, at 13-5. There are 15 residences located within 50 feet of the limit of work for the Project along the roadway portion of the Project, with the closest residence located 39 feet from the limit of work. Exhs. EV-2, at 5-71; EV-16, at 13-5. For context, there are a total of 315 residential homes along the entire length of the Project route. Exh. EV-16, at 13-5.

**Anticipated Construction Sound Levels for the Project**

| Activity | Types of Equipment | Typical Sound Levels at 50 feet (dBA) | Estimated Sound Levels (dBA) at Closest Residence along Project |
|---|---|---|---|
| | ***MBTA ROW Portion (1 residential unit within 50 feet; closest residence at 34 feet)[1]*** | | |
| Vegetation Removal and ROW Mowing | Grapple trucks<br>Bulldozers<br>Track-mounted mowers<br>Motorized tree shears<br>Log forwarders<br>Chippers<br>Chain saws<br>Box trailers | 84 to 98 | 87 to 101 |
| Erosion/Sediment Controls and Access Way Construction | Dump trucks<br>Bulldozers, excavators, backhoes<br>Graders<br>Forwarders<br>Grapple trucks | 80 to 93 | 83 to 96 |
| Restoration of the ROW | Bulldozers<br>Excavators<br>Tractor-mounted York rakes<br>Straw blowers<br>Hydro-seeders | 80 to 90 | 83 to 93 |
| Splice vault Installation | Splice vault crane<br>Backhoe<br>Dump truck | 82 to 90 | 85 to 93 |
| Trench Excavation, Duct Bank Installation, and Pavement Patching | Backhoe<br>Dump truck | 82 to 90 | 85 to 93 |
| Cable Pulling, Splicing and Testing | Generator<br>Air conditioner<br>Splicing van | 60 to 84 | 63 to 87 |
| | ***Roadway Portion (15 residential units within 50 feet; closest residence at 39 feet)[1]*** | | |
| Splice Vault Installation | Pavement Saw<br>Splice vaults Crane<br>Asphalt Paver<br>Backhoe<br>Dump Truck | 82 to 90<br><br>57 to 83<br>(Exh. TOH-NO-3) | 85 to 93 |
| Trench Excavation, Duct Bank Installation, and Pavement Patching | Pavement Saw<br>Concrete Batch Truck<br>Pneumatic Hammer<br>Mounted Impact Hammer (Hoe Ram)<br>Backhoe<br>Dump Truck | 82 to 90<br><br>57 to 83<br>(Exh. TOH-NO-3) | 85 to 93 |
| Cable Pulling, Splicing and Testing | Generator<br>Air conditioner<br>Splicing Van | 60 to 84<br><br>60 to 67<br>(Exh. TOH-NO-3) | 63 to 87 |

| Activity | Types of Equipment | Typical Sound Levels at 50 feet (dBA) | Estimated Sound Levels (dBA) at Closest Residence along Project |
|---|---|---|---|
| Final Pavement Restoration | Asphalt Paver | 85 | 88 |
| | | 63 to 83 (Exh. TOH-NO-3) | |

1 Estimated sound levels at the closest residence to both the MBTA ROW portion and the roadway portion are the same when rounded to the nearest integer.

Exhs. EV-2, at 5-72, Table 5-19; EV-16, at Table 13-1; TOH-NO-3.[82]

To mitigate noise impacts associated with the Project, the Company will take several steps. First, to the extent practicable, the Company will comply with all relevant local noise ordinances. Exhs. EV-2, at 5-70, 5-75; EV-16, at 13-5; EFSB-NO-4; EFSB-NO-4(1) through (4). In addition, while the Company does not believe that the Project activities will create excessive noise, contractors will be instructed to use equipment that is in good working order and the Company will consult with municipalities during the local permit application process on a case-by-case basis for a suggested work schedule, including relative to residential areas. Exh. EFSB-NO-16. The Company will minimize engine noise by making sure that only necessary equipment is running during construction and using construction equipment that meets all regulatory requirements. Exh. EFSB-NO-6. The Company primarily uses "low-noise" generators during cable pulling, splicing

82 The decibel levels presented in the table above are from a report of the U.S. EPA that identifies typical sound levels associated with construction activity. Tr. 13, at 2365. During the proceeding, the Company provided an additional table containing typical baseline sound levels at 50 feet for several construction activities associated with underground transmission line installation work. Exh. TOH-NO-3. These additional sound levels were based on recently-measured decibel levels from one of the Company's active construction sites during the months of October and November 2015. Exh. TOH-NO-3; Tr. 13, at 2365-66. Notably, although similar, the recently-measured sound levels indicate that actual sound levels associated with the Project are likely to be quieter than what is estimated in the table above. Tr. 13, at 2367.

and testing, thereby mitigating potential noise impacts. Exh. RR-EFSB-91.[83] It also bears noting that a building will provide significant attenuation of associated construction noise levels. Exh. EFSB-EIR-26. For instance, typical outdoor-to-indoor sound level reductions of 27 dBA can be expected during the winter (windows closed), with reductions of 17 dBA during summer (windows open). Exh. EFSB-EIR-26. At a typical residential location approximately 50 feet from the limit of work, sound levels for construction activities will be 27 dBA and 17 dBA quieter than those shown in the table above. Exh. EFSB-EIR-26.

With respect to the potential for operational noise impacts associated with the installation of the 20 MVAR shunt reactor and associated switching and protection equipment at Sudbury Substation, the Company's analysis indicates that future sound levels would increase by an imperceptible 0.3 to 0.4 dBA at the three closest residential receptors. Exhs. EV-2, Appendix 5-1, at 8; EFSB-NO-15. Because the sound level increases are less than 10 dBA, even during the quietest period of the night, noise impacts from the new Project equipment will be consistent with MassDEP standards. Exh. EV-2, at Appendix 5-1, at 8. In any event, the closest residential receptors are approximately 750 from the substation. Exh. EV-2, App. 5-1 at 5. Moreover, the Company's analysis indicates that there will be no pure tone condition, as defined by MassDEP. Exh. EV-2, at Appendix 5-1, at 8. In sum, the introduction of the proposed shunt reactor and related equipment at Sudbury Substation would not cause sound levels in excess of MassDEP or Town of Sudbury regulations; thus, there is no need to implement sound mitigation measures at Sudbury Substation. Exh. EV-2, at Appendix 5-1, at 8.

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[83] An example of such a low-noise generator is the Honda EB6500 that is rated to generate sound levels of 73 dBA at 9 feet, which would be a sound level of 58 dBA at a distance of 50 feet. Exh. RR-EFSB-91. This equipment is lower than the range (60 to 84 dBA at 50 feet) for generator sound emissions indicated in the table above. Exh. RR-EFSB-91. For further reference, the Federal Highway Administration Roadway Construction Noise Model ("RCNM") provides reference sound levels for construction equipment; the RCNM database indicates that sound emissions from "standard" generators can typically be 81 to 82 dBA at 50 feet. Exh. RR-EFSB-91.

Accordingly, the record shows that the Company has properly minimized noise impacts associated with the Project.

12. Electric and Magnetic Fields

Electric fields ("EF") and MF, collectively known as EMF, are forms of energy that surround an operating electrical device. Exh. EV-2, at 5-77. Electric fields are produced within an area surrounding the object (e.g., a wire) when a voltage is applied to it and are measured in units of kilovolts per meter ("kV/m"). Exh. EV-2, at 5-77. The level of EF near an energized power line depends on the applied voltage, the distance between the conductors and the distance to the measurement location. Exh. EV-2, at 5-77. Magnetic fields are produced within the area surrounding the conductor or device that is carrying an electric current and are measured in units of milligauss ("mG"). Exh. EV-2, at 5-77. The level of MF near transmission line conductors depends on the magnitude of the current, the distance between conductors and the distance to the measurement location. Exh. EV-2, at 5-77. MF levels can vary moment to moment, depending on current flow, and so calculations to predict levels of MF generated from a specific source, in this case a new 115-kV transmission line, are based on predicted annual average and peak line loadings. Exh. EV-2, at 5-77. The best estimate of the MF on any day is provided by calculations based on the annual average load. Exh. EV-2, at 5-77.

Underground lines do not produce any above-ground electric fields because the electric field is totally shielded. Exh. EV-2, at 5-79. Thus, the electric fields from the Project's all-underground line installation will be completely shielded. Exh. EV-2, at 5-79.

To characterize the potential effect of the proposed transmission line on the existing levels of MF, the Company calculated the expected MF along the Project route. Exhs. EV-2, at 5-78; EV-2, Appendix 5-9. Calculations were made for the specific line configurations for system operation at projected annual average and peak loadings in 2023. Exh. EV-2, at 5-79. The

calculated MF levels for the underground Project design at 25 feet from the center of the phase conductors at annual average loading are provided below.[84]

**Magnetic-field levels (mG) at annual average loading for underground portions of the new line[1]**

| | | Location | |
|---|---|---|---|
| **Design Option** | **Configuration** | **–25 ft.** | **+25 ft.** |
| **Project** | Underground - Inverted Delta | 3.4 | 1.8 |
| | Underground – Manhole | 4.4 | 4.4 |

[1] Calculated levels may vary based upon determination of final burial depth.

Even at the closest edge of the paved path of the proposed rail trail (5 feet from the duct bank centerline), magnetic field levels are anticipated to be only 19 mG under average loading. Exh. RR-EFSB-31.

There are no federal or state laws or regulations in Massachusetts that limit human exposure to EMF. Exh. EV-2, at 5-80. There are international exposure guidelines that have been developed by the International Commission on Non-Ionizing Radiation Protection ("ICNIRP") and the International Committee on Electromagnetic Safety ("ICES") to protect workers and the general public from known adverse effects at very high levels of EMF.[85] Exh. EV-2, at 5-80 to 5-81. The World Health Organization ("WHO") has recommended these EMF guidelines as protective of public health and further recommended that considering the evidence reviewed by the WHO, implementing very low-cost measures to reduce exposure to magnetic fields is reasonable when constructing new facilities. Exh. EV-2, at 5-80. The Siting Board has similarly

[84] There are no residences within 25 feet of the Project; there are 10 residences within 25-50 feet of the Project. Exh. EFSB-MF-1.

[85] The ICNIRP reference levels are 2,000 mG and 4.2 kV/m (ICNIRP, 2010); the ICES maximum permissible exposure levels are 9,040 mG and 5 kV/m (ICES, 2002).

stated that "the Board has recognized public concern about EMF and has encouraged the use of practical and cost-effective design to minimize magnetic fields along transmission ROW,"[86] an approach consistent with the recommendations of the WHO. Exh. EV-2, at 5-80.

For the Project, MF levels are far below national and international guidelines for public exposure to EMF. Exh. EV-2, at 5-82. Moreover, the routing of the proposed transmission line along the MBTA ROW reduces the length of the route nearby to residences, thereby minimizing exposure to the magnetic fields from the line to levels commonly associated with the operation of low-voltage distribution lines that distribute power locally within communities. Exh. EV-2, at 5-82. In addition, the Project has been designed to reduce potential magnetic field levels, primarily because the Project design places the conductors closer together in a delta configuration and underground. Tr. 4, at 684-85. Given that the magnetic field levels are so far below stated guidelines and will be at very modest levels, further mitigation is not warranted in this instance.

Based upon the foregoing, EMF impacts associated with the Project have been properly minimized.

13. Conclusion on Environmental Impacts

As described above, the Company has demonstrated that its plans for the construction and operation of the Project have appropriately minimized environmental impacts associated with construction, wetlands and water resources, historic and cultural resources, traffic and transportation, public shade trees, hazardous waste, visual, EMF, noise, and protected habitats.

[86] Greater Springfield Reliability Project, EFSB 08-2/D.P.U. 08-105/08-106 (2010).

### F. The Project Is Consistent With the Current Health, Environmental Protection and Resource Use and Development Policies of the Commonwealth.

Pursuant to G.L. c. 164, § 69J, the Siting Board shall approve a petition to construct a facility if, inter alia, the Siting Board determines that "plans for expansion and construction of the applicant's new facilities are consistent with current health, environmental protection, and resource use and development policies as adopted by the commonwealth." The Project not only satisfies the requirements of this statute, but also is fully consistent with other important state energy policies as articulated in the Electric Utility Restructuring Act of 1997 (the "Restructuring Act"), the Green Communities Act (Chapter 169 of the Acts of 2008), the Energy Diversity Act (Chapter 188 of the Acts of 2016) and the Global Warming Solutions Act (Chapter 298 of the Acts of 2008). Exh. EV-2, at 6-1.

#### 1. The Project Is Consistent With the Health Policies of the Commonwealth.

The Project will be consistent with applicable health policies of the Commonwealth. The Restructuring Act provides that reliable electric service is of "utmost importance to the safety, health, and welfare of the Commonwealth's citizens and economy . . . ." See Restructuring Act, § 1(h). The Legislature has thereby expressly determined that an adequate and reliable supply of energy is critical to the state's citizens and economy. The Project will be fully consistent with this policy because the Project will enhance the reliability of the interconnected electric transmission system in the Marlborough Subarea of Subarea D, enabling the Company to continue to ensure the availability of sufficient and reliable electric service to the citizens and businesses of the Commonwealth and the region, a matter that greatly affects public health and safety. Exh. EV-2, at 6-1.

In addition, the Company will design, build and maintain the facilities for the Project so that the health and safety of the public are protected. Exh. EV-2, at 6-1. This will be accomplished

through adherence to all federal, state and local regulations, and industry standards and guidelines established for the protection of the public. Exhs. EV-2, at 6-1; EFSB-S-1. All design, construction and operation activities will be in accordance with applicable governmental and industry health and safety standards such as Massachusetts Code for the Installation and Maintenance of Electric Transmission Lines (220 C.M.R. 125.00) as well as the National Electric Safety Code and OSHA regulations, and will have no adverse health effects. Exhs. EV-2, at 6-1; EFSB-S-1; RR-EFSB-88. The facilities will be designed in accordance with sound engineering practices using established design codes and guides published by, among others, the Department, the Institute of Electrical and Electronic Engineers, the American Society of Civil Engineers, the American Concrete Institute, and the American National Standards Institute. Exh. EV-2, at 6-1 to 6-2.

Practices that will be used to protect the public during construction will include, but not be limited to, establishing traffic control plans for construction traffic on municipal streets and state highways to maintain safe driving conditions; restricting public access to work areas; and using temporary guard structures at road and other utility crossings to prevent accidental contact with the conductor during installation. Exh. EV-2, at 6-2. Following construction of the facilities, all transmission structures and substation facilities will be clearly marked with warning signs to alert the public to potential hazards. Exh. EV-2, at 6-2.

In addition, because the Project will be consistent with, and promote, the Commonwealth's energy policies as outlined in the Restructuring Act, it will also be consistent with its health policies. Exh. EV-2, at 6-2. The Restructuring Act provides that, "since reliable electric service is of the utmost importance to the safety, health and welfare of the Commonwealth's citizens and

economy, electric industry restructuring should enhance the reliability of the interconnected regional transmission system…" see Restructuring Act, § 1(h).

2. The Project Is Consistent With the Environmental Protection Policies of the Commonwealth.

The Project is also consistent with the environmental protection policies as set forth in Chapter 164 of the General Laws and in other state and local environmental policies. Exh. EV-2, at 6-2. First, the Restructuring Act provides that the Company must demonstrate that the Project minimizes environmental impacts consistent with the minimization of costs associated with the mitigation, control and reduction of the environmental impacts of the Project. Exh. EV-2, at 6-2. Accordingly, an assessment of all impacts of a proposed facility is used to determine whether an appropriate balance is achieved both among conflicting environmental concerns, as well as among environmental impacts, costs and reliability. Exh. EV-2, at 6-2.

A facility that achieves the appropriate balance thereby meets the Chapter 164 requirement to minimize environmental impacts at the lowest possible cost. Exh. EV-2, at 6-2. To determine if a petitioner has achieved the proper balance among environmental impacts, cost, and reliability, the Siting Board first determines if the petitioner has provided sufficient information regarding environmental impacts and potential mitigation measures in order to make such a determination. Exh. EV-2, at 6-2 to 6-3. The Siting Board then determines whether environmental impacts are minimized. Exh. EV-2, at 6-3. Similarly, the Siting Board evaluates whether the petitioner has provided sufficient cost information in order to determine if the appropriate balance among environmental impacts, cost, and reliability has been achieved. Exh. EV-2, at 6-3.

As demonstrated above, the Company has compared a range of alternative projects and proposed specific plans to carefully mitigate environmental impacts associated with the construction, operation and maintenance of the Project, consistent with cost minimization. Exh.

EV-2, at 6-3. As such, the Project is consistent with the environmental policies of the Commonwealth as set forth in Chapter 164 of the General Laws and the Restructuring Act. Exh. EV-2, at 6-3.

More generally, the Project will obtain all environmental approvals and permits required by federal, state and local agencies and will be constructed and operated to comply fully with all relevant federal, state and municipal regulations and environmental policies. Exhs. EV-2, at 6-3, 6-7, Table 6-1; EV-16, at Table 2-3, Table 2-4 and Table 2-5. Thus, the Project will contribute to a reliable, low cost, diverse energy supply for the Commonwealth while avoiding, minimizing, and mitigating environmental impacts to the maximum extent practicable. Exh. EV-2, at 6-3. The federal permits and approvals that the Project will secure include a Section 404 Permit under the Federal Clean Water Act issued by the USACE; Obstruction Review (14 CFR Part 77) by the Federal Aviation Administration ("FAA"); and, a USEPA-issued National Pollutant Discharge and Elimination System ("NPDES") General Permit for Storm Water Discharges from Construction Activities. Exhs. EV-2, at 6-3; .EV-16 at 2-8 to 2-30.

The state permits and approvals that the Company will secure include a 401 Water Quality Certificate from the MassDEP; Highway Access Permit and Land Lease Agreement from the MassDOT; and MHC Section 106(c) review. Exh. EV-2, at 6-3. The Company will also file a Final Environmental Impact Report pursuant to the MEPA and will obtain a Certificate from the Secretary of Energy and Environmental Affairs ("EEA") affirming the Project's consistency with MEPA requirements, i.e., that all Project-related impacts to the environment have been properly and adequately identified, minimized and mitigated. Exhs. EV-2, at 6-3; RR-EFSB-104.

In addition, the Project will require and obtain local approvals from the Towns of Hudson, Stow and Sudbury, including road opening permits; grants of location; and, Orders of Condition

under the Massachusetts Wetlands Protection Act and local wetland bylaws, as applicable. Exh. EV-2, at 6-3.

In addition, the Project is consistent with the Commonwealth's Environmental Justice ("EJ") Policy. Exh. EV-2, at 6-4. Environmental justice is the equal protection and meaningful involvement of all people and communities with respect to the development, implementation, and enforcement of energy, climate change, and environmental laws, regulations, and policies and the equitable distribution of energy and environmental benefits and burdens. Exh. EV-2, at 6-4. The EJ Policy was initially promulgated in 2002 by the predecessor to the EEA; was in 2014 subsequently updated through Executive Order #552; and most recently, on January 31, 2017, was further updated by the Secretary of EEA. Exh. EV-2, at 6-4. The current EJ Policy is imposed on state agencies under the Executive Office of Energy and Environmental Affairs, including the Siting Board and the Department, rather than on project applicants *per se*. Exh. EV-2, at 6-4. In turn, project applicants must comply with relevant directives and requirements established by these state agencies. Exh. EV-2, at 6-4. Thus, the provisions and requirements of the Commonwealth's EJ Policy are not directly applicable to the Project. Exh. EV-2, at 6-4. Nevertheless, the Company's environmental analysis in this proceeding is designed to minimize the Project's impacts to all populations, including EJ populations. Exh. EV-2, at 6-4. Further, regardless of any legal obligation and consistent with the Commonwealth's EJ Policy, the Company has undertaken, and will continue to undertake, an extensive community outreach effort in order to facilitate the meaningful opportunity to participate by all. Exh. EV-2, at 6-4. As such, the Project is consistent with the Commonwealth's environmental policies. Exh. EV-2, at 6-4.

The Project is also fully consistent with the Green Communities Act. Exh. EV-2, at 6-4. The Green Communities Act is a comprehensive, multi-faceted energy reform bill that encourages

energy and building efficiency, promotes renewable energy, creates green communities, implements elements of the Regional Greenhouse Gas Initiative, and provides market incentives and funding for various types of energy generation. Exh. EV-2, at 6-4. The Green Communities Act (as amended and supplemented by St. 2012, c. 209, An Act Relative to Competitively Priced Electricity) can be expected to result in greater renewable supplies and substantial new conservation initiatives in future years. Exh. EV-2, at 6-4. The improvements to the transmission system in the Marlborough Subarea of Subarea D will strengthen and improve the reliability of the regional transmission system. Exh. EV-2, at 6-4. While the primary Project purpose is improved reliability consistent with ISO-NE requirements, the more robust system will enable a more efficient and flexible operation of the grid consistent with the Green Communities Act. Exh. EV-2, at 6-4.

For similar reasons, the Project is likewise consistent with the recently-enacted legislation, "An Act to Promote Energy Diversity" ("Energy Diversity Act"), which Governor Charles Baker signed into law on August 8, 2016. St. 2016, c. 188. The Energy Diversity Act is a multi-faceted energy bill that, among other things, facilitates the procurement and integration of renewable energy generation resources, including new offshore wind energy generation, firm service hydroelectric generation and new Class I RPS eligible resources. St. 2016, c. 188, § 12. The Project will improve the reliability of the regional transmission system and thereby create a more robust transmission system that is better able to accommodate various energy resources that may come online in the future as a result of the Energy Diversity Act. Exh. EV-2, at 6-5. Accordingly, the Project is consistent with the Energy Diversity Act. Exh. EV-2, at 6-5.

Lastly, the Project is consistent with the Global Warming Solutions Act ("GWSA"). Exh. EV-2, at 6-5. The GWSA established aggressive greenhouse gas ("GHG") emissions reduction

targets of 25 percent from 1990 levels by 2020 and 80 percent from 1990 levels by 2050. Exh. EV-2, at 6-5. Pursuant to the GWSA, the Secretary of the EOEEA issued the Clean Energy & Climate Plan for 2020 in December 2010. Exh. EV-2, at 6-5. Among other provisions, the GWSA obligates administrative agencies such as the Siting Board, in considering and issuing permits, to consider reasonably foreseeable climate change impacts (e.g., additional GHG emissions) and related effects (e.g., sea level rise). Exh. EV-2, at 6-5. The proposed improvements to the transmission system in the Marlborough Subarea of Subarea D will have no adverse climate change impacts or negative effects on sea levels. Exh. EV-2, at 6-5. Consequently, the Project is consistent with the GWSA. Exh. EV-2, at 6-5.

3. The Project Is Consistent With the Resource Use and Development Policies of the Commonwealth.

The Project, which will contribute to the long-term maintenance and reliability of the electric transmission system in the Marlborough Subarea of Subarea D and surrounding communities, will be constructed and operated in compliance with Massachusetts' policies regarding resource use and development. Exh. EV-2, at 6-5. For example, in 2007, the EOEEA's Smart Growth/Smart Energy policy established the Commonwealth's Sustainable Development Principles, including: (1) supporting the revitalization of city centers and neighborhoods by promoting development that is compact, conserves land, protects historic resources and integrates uses; (2) encouraging remediation and reuse of existing sites, structures and infrastructure rather than new construction in undeveloped areas; and (3) protecting environmentally sensitive lands, natural resources, critical habitats, wetlands and water resources and cultural and historic landscapes. Exh. EV-2, at 6-5. As shown in this proceeding, the Project will support these principles because, among other reasons, the Project will be located primarily within an MBTA ROW and existing streets and does not require the establishment of new rights-of-way; thus, no

previously undisturbed property will be affected by the siting, construction or installation of the Project. Exh. EV-2, at 6-6. In addition, the MBTA ROW would incur similar impacts as a result of the construction and operation of the planned multi-use trail proposed by the DCR. Exh. EV-2, at 6-6. The community will benefit from the Project by advancing the proposed Mass Central Rail Trail, saving Commonwealth funds to construct the multi-use trail and reducing the overall cumulative environmental impact. Exh. EV-2, at 6-6. In addition, the Project does not trigger the need for Article 97 approval. Exh. EFSB-LU-40; Tr. 9, at 1,540-41. The Project, therefore, is consistent with, and furthers, the Commonwealth's policies regarding resource use and development. Exh. EV-2, at 6-6.

4. Conclusion

Based on the foregoing, the Company has satisfied the requirement in G.L. c. 164, § 69J that the Project is "consistent with current health, environmental protection, and resource use and development policies as adopted by the [C]ommonwealth."

## VI. THE PROJECT SATISFIES THE STATUTORY STANDARDS FOR THE GRANT OF INDIVIDUAL AND COMPREHENSIVE ZONING EXEMPTIONS.

Pursuant to G.L. c. 40A, § 3, the Company filed a petition in connection with the Project seeking individual and comprehensive zoning exemptions from the operation of the Sudbury, Hudson and Stow Zoning Bylaws. Exh. EV-4. As set forth in more detail below, to obtain exemptions from the Zoning Bylaws, the Company must: (1) qualify as a public service corporation; (2) demonstrate that its present or proposed use of the land or structure is reasonably necessary for the public convenience or welfare; and (3) establish that it requires an exemption from the Zoning Bylaws. The record evidence conclusively demonstrates that the Company has satisfied all criteria for the requested exemptions.

### A. Eversource Is a Public Service Corporation.

In determining whether a petitioner qualifies as a "public service corporation," the Supreme Judicial Court has held that:

> [A]mong the pertinent considerations are whether the corporation is organized pursuant to an appropriate franchise from the State to provide for a necessity or convenience to the general public which could not be furnished through the ordinary channels of private business; whether the corporation is subject to the requisite degree of governmental control and regulation; and the nature of the public benefit to be derived from the service provided.

Save the Bay, 366 Mass. at 680.

Eversource is an electric company as defined in G.L. c. 164, § 1 and, therefore, is a public service corporation authorized to transmit and distribute electricity. Eversource Walpole-Holbrook at 91; Eversource Mystic-Woburn at 78; Eversource Woburn at 6; NSTAR Electric Company d/b/a Eversource Energy, D.P.U. 15-02, at 6-7 (2015) ("Eversource Hopkinton"); NSTAR Electric Company, D.P.U. 14-55/14-56, at 12; NSTAR Electric Company, D.P.U. 13-177/13-178, at 10-11 (2015). As an electric company and public service corporation in the Commonwealth, the Company is entitled to seek a zoning exemption pursuant to G.L. c. 40A, § 3. Eversource Hopkinton at 6-7; NSTAR Stoughton at 150; Save the Bay, 366 Mass. at 680.

### B. The Project Is Reasonably Necessary for the Public Convenience and Welfare.

When making a determination as to whether a petitioner's present or proposed use is reasonably necessary for the public convenience or welfare, the Department and the Siting Board balance the interests of the general public against the local interest and determine whether the present or proposed use of the land or structures is reasonably necessary for the convenience or welfare of the public. Save the Bay, 366 Mass. at 680; Town of Truro v. Department of Public Utilities, 365 Mass. 407, 410-11 (1974); Eversource Walpole-Holbrook at 92; Eversource Mystic-Woburn at 79; Eversource Woburn at 4. Specifically, the Department and the Siting Board

undertake "a broad and balanced consideration of all aspects of the general public interest and welfare and not merely [an] examination of the local and individual interests which might be affected." New York Central Railroad, 347 Mass. at 592; Eversource Walpole-Holbrook at 92; Eversource Mystic-Woburn at 79; Eversource Woburn at 4-5. When reviewing a petition for a zoning exemption, the Department and the Siting Board consider the public effects of the requested exemption in the state, as a whole, and upon the territory served by the petitioner. Save the Bay, 366 Mass. at 685; New York Central Railroad, 347 Mass. at 592; Eversource Walpole-Holbrook at 92; Eversource Mystic-Woburn at 79; Western Massachusetts Electric Company and New England Power Company d/b/a National Grid, D.P.U. 13-187/13-188, at 7 (2015) ("WMECO/NEP Northfield/Erving").

Therefore, when making a determination as to whether a petitioner's present or proposed use is reasonably necessary for the public convenience or welfare, the Department and the Siting Board examine: (1) the present or proposed use and any alternatives or alternative sites identified; (2) the need for, or public benefits of, the present or proposed use; and (3) the environmental impacts or any other impacts of the present or proposed use. Eversource Walpole-Holbrook at 92-93; Eversource Mystic-Woburn at 79; Eversource Woburn at 5. The Department and the Siting Board then balance the interests of the general public against the local interest and determine whether the present or proposed use of the land or structures is reasonably necessary for the convenience or welfare of the public. Eversource Walpole-Holbrook at 93; Eversource Mystic-Woburn at 79; Tennessee Gas Company, D.T.E. 98-33, at 4-5 (1998). The record in this

proceeding conclusively demonstrates that the Project is reasonably necessary for the public convenience and welfare.[87]

1. The Project Is Needed.

The need for the Project is comprehensively addressed in Section V.A., above. See also Exh. EV-2, at § 2.0. For these reasons, the Siting Board should find that the Project is needed and that it will benefit the region's electricity customers by protecting against potential low voltage, voltage collapse and thermal overloads, thereby allowing the reliable transmission of electricity within the Marlborough Subarea of Subarea D.

2. Alternatives to the Project Have Been Fully Evaluated.

As described in detail in Section V.B., above, the Company has evaluated potential alternatives to the Project that could address the various needs described above and has considered the complexity, cost and time required to implement them. The Company has demonstrated that the proposed Project meets the identified need for capacity and reliability purposes, and does so at the least cost and with the least environmental impact.

3. There Will Be Minimal Impacts From the Project.

As detailed in Section V.E., above, the Company conducted a comprehensive analysis of the environmental impacts of the Project and have appropriately minimized and mitigated those impacts while also balancing considerations of safety, design standards, cost and reliability. See also Exh. EV-2, at § 5.0. The Company has also demonstrated that the Project is consistent with

[87] The Department's well-established precedent provides that the public interest analysis required by G.L. c. 40A, § 3 is analogous to the Department's analysis for the "reasonably necessary for the convenience or the welfare of the public" standard under G.L. c. 164, § 72. See WMECO/NEP Northfield/Erving at 48; NSTAR Stoughton at 149-50, 163; New England Power Company, D.P.U. 89-163, at 6 (1993). Accordingly, to the extent that the Company demonstrates that the Project satisfies the statutory requirements under Section 72, it also satisfies the public convenience and welfare standard under Chapter 40A.

the Commonwealth's current health, environmental protection and resource use and development policies. See Exh. EV-2, at § 6.0.

For the foregoing reasons, the Siting Board should find that the Project is reasonably necessary for the convenience and welfare of the public.

### C. The Project Requires Individual and Comprehensive Zoning Exemptions.

#### 1. Standard of Review for Individual Exemptions

In determining whether an exemption from a particular provision of a zoning ordinance is "required," the Department looks to whether the exemption is necessary to allow construction or operation of the petitioner's project as proposed. Eversource Walpole-Holbrook at 93; Eversource Mystic-Woburn at 80; Eversource Woburn at 6. The petitioner must identify the individual zoning provisions applicable to its project and establish that an exemption from each of the provisions is required. Id. The Department and the Siting Board have previously stated that:

> [t]he Company is both in a better position to identify its needs, and has the responsibility to fully plead its own case. . . . The Department fully expects that, henceforth, all public service corporations seeking exemptions under c. 40A, § 3 will identify fully and in a timely manner all exemptions that are necessary for the corporation to proceed with its proposed activities, so that the Department is provided ample opportunity to investigate the need for the required exemptions.

Eversource Walpole-Holbrook at 94; Eversource Mystic-Woburn at 80-81 n.71; Eversource Woburn at 6 quoting New York Cellular Geographic Service Area, Inc., D.P.U. 94-44, at 18 (1995). The Department and the Siting Board also encourage zoning exemption applicants to consult with local officials prior to seeking zoning exemptions under G.L. c. 40A, § 3. Eversource Mystic-Woburn at 82; Eversource Woburn at 38; Eversource Hopkinton at 46. The Company has complied with each of these requirements.

2. The Project Requires Individual Zoning Exemptions from the Operation of the Sudbury Zoning Bylaw.

The New Line would traverse the following zoning districts along the MBTA ROW in Sudbury: A-Residential ("A-Res"), Single Residence C, Wayside Inn Historic Preservation, Business, and Limited Industrial. Exh. EV-3, at 14. Sudbury Substation is located in an A-Res zoning district. Exh. EV-3, at 14. Based on the Company's review of the Sudbury Zoning Bylaw, the Project would require variances and special permits to construct the Project in Sudbury, as set forth below. Exh. EV-3 at 14-19. In addition, no local zoning relief is available for work proposed in the Water Resource Protection Overlay District, and, accordingly, a zoning exemption is *per se* required from the operation of those provisions. Exh. EV-3 at ¶31.

**Use – New Line in New Electric ROW**. Given that the New Line will be constructed on a new electric ROW a special permit would be required pursuant to Section 2230, the Table of Principal Use Regulations, which allows "Essential Services" in all zoning districts by special permit granted by the Zoning Board of Appeals. Exh. EV-3, at 16-17. "Essential Services" include those provided by a public service corporation by the erection, construction, alteration, or maintenance of underground electrical transmission systems through wires, pipes, conduits, cables and other similar equipment in connection therewith. Exh. EV-3, at 16-17. To grant a special permit, the Zoning Board of Appeals must find that the following conditions are met: (a) the use is in harmony with the general purpose and intent of the bylaw; (b) the use is in an appropriate location and is not detrimental to the neighborhood and does not significantly alter the character of the zoning district; (c) adequate and appropriate facilities will be provided for the proper operation of the proposed use; (d) the proposed use would not be detrimental or offensive to the adjoining zoning districts and neighboring properties due to the effects of lighting, odors, smoke, noise, sewage, refuse materials or other visual nuisances; and (e) the proposed use would not cause

undue traffic congestion in the immediate area. Exh. EV-3, at 17. The grant of a special permit is discretionary, the standards are subjective and a special permit, if granted, would be susceptible to appeal. Exh. EV-3, at 17. Because of the legal uncertainty in obtaining a special permit, and the potential for adverse interpretations, delay, burden and undue expense associated with the permitting process and appeals therefrom, the Company seeks an exemption from the requirement in Section 2230 to obtain a special permit for the New Line. Exh. EV-3, at 17.

**Use – New Line in Water Resource Protection Overlay District**. Portions of the New Line are located in the Water Resource Protection Overlay District, which is established by and regulated under Article 4200 of the Sudbury Zoning Bylaw. Exhs. EV-3, at 17; EFSB-Z-13(1). The Water Resource Protection Overlay District applies to, among other activities, all new construction and new uses and provides that uses not permitted in the underlying zoning district are not permitted in the Water Resource Protection Overlay District. Exh. EV-3, at 17. To the extent that construction of the New Line would not be permitted in the Water Resource Protection Overlay District because it is not an as-of-right use in the underlying zoning district, the Company

would need to obtain a use variance to construct the New Line.[88] Exh. EV-3, at 17-18. However, the Zoning Board of Appeals is authorized to grant use variances only in certain circumstances, none of which the Company believes apply here.[89] Exh. EV-3, at 18; Exh. EFSB-Z-4. Because there is no local relief available that would authorize construction of the New Line in the Water Resource Protection Overlay District, an exemption from the requirements of Article 4200 are *per se* required.[90] Exhs. EV-3, at 18; Exhs. EFSB-4, EFSB-Z-16, EFSB-Z-17.

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88 The Company notes that there are specific provisions of Article 4200 from which the Company would need to seek exemption but for the Company's request for an exemption from all provisions of Article 4200 because the Project is not allowed in the underlying zoning districts. For example, the Company may use a starter fertilizer with the application of seed during the final stabilization of disturbed soils. Exh. EFSB-Z-15. Even though this is the only instance where fertilizer will be used in connection with the Project, Sections 4243(c) and 4253(b) of the Sudbury Zoning Bylaw require a special permit in connection with the application of fertilizers for non-domestic or non-agricultural uses in Zones II and III, respectively. Id. Some portions of the New Line in Sudbury are located in a Zone II and some are located in a Zone III. Id. In addition, the Company expects to excavate earth material from the transmission line duct bank and to place the material on the access road for grading. Exh. EFSB-Z-16. Any excess material removed will be disposed off-site. Id. Because material may be re-used at different locations along the duct bank, or removed from site as excess material, the Project may not comply with Section 4260 of the Zoning Bylaw, which specifies the procedures and conditions for the grant of a special permit for excavation in the Water Resource Protection Overlay District. Id. The Project also will not be able to meet the following special conditions found in Section 4261 of the Sudbury Zoning Bylaw that are required for the grant of a special permit under Section 4200 for excavation in the Water Resource Protection Overlay District because they are inconsistent with the Company's access road or transmission line design requirements or practices of the DCR in rail trail development: (1) provision of surface drainage for land; (2) scarify compacted soils to at least 12 inches; (3) cover work area with no less than 6 inches of topsoil and seed; and (4) fill material shall contain no solid waste, toxic or hazardous materials or hazardous waste. Exh. EFSB-Z-17. As noted herein, to grant a special permit, the Zoning Board of Appeals must find that a number of conditions are met, many of which are subjective. Exh. EV-3, at 17. Moreover, the grant of a special permit is discretionary, the standards are subjective and a special permit, if granted, is susceptible to appeal. Exh. EV-3, at 17. Were a blanket exemption from all provisions of Article 4200 not granted, as requested by the Company because the Project is not allowed in the underlying zoning districts, the Company would still require exemption from these specific provisions.

89 The circumstances for which use variances may be granted, as provided in Section 6140 of the Sudbury Zoning Bylaw, include; (1) expiration of the time limit specified for a previously granted use variance; (2) existence prior to January 1, 1978, of uses of the same general classification as the use variance applied for, on lots adjoining the lot in question on both sides, or, if the lot is question is a corner lot, on both sides and the rear; (3) existence on the lot in question of a lawful use of such nuisance characteristics as to render unreasonable any conforming use of the lot in question; and (4) existence on the lot in question of a lawful structure or structures in good repair and of appearance compatible with its vicinity which can reasonably be maintained as a visual and taxable asset only if some nonconformity of use is permitted. Exhs. EV-3, at 18 n.4; EFSB-Z-4. None of these circumstances would appear to apply to the proposed new public utility use along the MBTA ROW. Exhs. EV-3, at 18 n.4; EFSB-Z-4.

90 The Company completed a detailed Groundwater Hydrology Assessment for the potential for the proposed Project to affect the flow and quantity of water to public water supply wells in Sudbury. Exhs. EV-2, at 5-35, Appendices 5-6 and 5-7; EV-16, Appendices 8-1 and 8-2. As concluded in the Groundwater Hydrology Assessments, the installation of the Project will not have any appreciable impact on groundwater flow or

**Use – New Line in the Floodplain**. Section 4100 of the Sudbury Zoning Bylaw established a Flood Plain Overlay District and regulates uses therein. Exh. EV-4, Section 4100. The construction of the New Line will include some work in the floodplain and, thus, is subject to the provisions of Section 4100. Exhs. EV-2, at 5-29 to 5-30; SUD-DEIR-30; RR-SUD-10; Tr. 11, at 2063. Section 4140 prohibits the erection, construction, alteration, enlargement, creation or movement of all buildings, walls, dams and structures for any purpose within the Flood Plain Overlay District and, thus, construction of the New Line in the overlay district would require zoning relief in the form of a use variance. Exh. EV-4, Section 4140. Section 4166 provides the Board of Appeals the authority to allow by special permit, after finding there would be no risk to flood plain resources or other derogation from the intent and purpose of the bylaw, the filling, excavating or transferring of any material and the erection and construction of any structure. Exh. EV-4, Section 4166. Thus, at a minimum, a special permit would be required to construct the New

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public water supply well yields in Sudbury. Exhs. EV-2, at 5-35; EV-16, at 8-3; Tr. 10, at 1,661. Most of the Project would be installed above the elevation of the groundwater surface, where it would not be possible to have any effect on groundwater flow rates or directions. Exh. EV-16, at 8-3. Project components located deeper underground, such as splice vaults, would extend into the water table in a few locations; however, they would not significantly alter flow rates or directions because construction would only enter a small fraction of the aquifer, which is highly permeable, allowing groundwater to flow under and around the structures in the same rates and directions it does presently. Exh. EV-16, at 8-3. To ensure that there are no impacts to public water supplies during construction of the Project, Eversource will develop and implement a Storm Water Pollution Prevention Plan ("SWPPP") that includes spill protection controls and countermeasures to ensure that there are no impacts to groundwater in the event of a spill during construction. Exh. EV-2, at 5-35 to 5-36. The Company will prepare and implement the SWPPP in accordance with the Company's BMPs, as well as the USEPA's National Pollutant Discharge Elimination System Construction General Permit. Exhs. EV-2, at 5-35 to 5-36; EFSB-W-4. In addition, Eversource will require its contractors to use equipment that has been properly maintained to reduce the risk of a spill. Exh. EV-2, at 5-37. Contractors will also be required to have spill containment and prevention devices (e.g., drip pans, absorbent pads, etc.) accessible to crews at each work location. Exh. EV-2, at 5-37. The Company will require its contractors to adhere to its BMPs, including those relative to the storage and handling of oils, lubricants, and other chemicals during construction. Exh. EV-2, at 5-37. Other than equipment that is not readily mobile, equipment will not be refueled or maintained within wetland resource areas and equipment/material storage will not be permitted within 100 feet of any wetland or waterbody. Exh. EV-2, at 5-37. Contractor staging areas and contractor yards typically will be located at existing developed areas (such as parking lots), where the storage of construction materials and equipment, including fuels and lubricants, will not conflict with protection of public surface water supplies or wetland resources. Exh. EV-2, at 5-37. Accordingly, the Company has taken steps to properly minimize impacts to public water supply resource areas during construction of the Project.

Line in the Flood Plain Overlay District. As noted above, the grant of a special permit is discretionary and, even if granted, would be susceptible to appeal. Exh. EV-3, at 17. Because of the legal uncertainty in obtaining a special permit, and the potential for adverse interpretations, delay, burden and undue expense associated with the permitting process and appeals therefrom, the Company seeks an exemption from the requirement in Section 4166 to obtain a special permit for the New Line. To the extent that the Board of Appeals does not make the requisite findings for the grant of a special permit for the New Line, then a use variance would be required. As noted above, while the Board of Appeals has limited authority to grant use variances, the Company does not believe that the exceptions would apply to the Project. Exh. EV-3, at 18; Exh. EFSB-Z-4. In that case, no zoning relief would be available locally and an exemption from Section 4100 would be per se required to construct the New Line in the Flood Plain Overlay District.

**Height**. The only dimensional requirement for which the proposed modifications at Sudbury Substation would require zoning relief is the maximum height requirement in the A-Res district, which limits structure heights in the A-Res district to 35 feet and for which, accordingly, a variance would be required for the proposed installation of an approximately 100-foot high shielding mast in the existing Substation yard.[91] Exh. EV-3, at 14. To grant a variance, the Sudbury Zoning Board of Appeals would need to find the following in accordance with G.L. c. 40A, § 10: (a) circumstances exist relating to soil conditions, shape or topography of the particular parcel or structure that do not affect generally the zoning district in which the parcel or structure is located; (b) a literal enforcement of the provisions of the bylaw would involve substantial hardship to the applicant and there is a nexus between the special circumstance and the

[91] In 1956, the Department exempted the initial construction of Sudbury Substation and the continued use and maintenance of Sudbury Substation on the substation site from the operation of the Sudbury Zoning Bylaw (D.P.U. 11861). Exhs. EV-3, at 14; EFSB-Z-3(1). Accordingly, the modifications proposed at Sudbury Substation do not require any local zoning relief with regard to *use* of the substation site for substation purposes. Exh. EV-3, at 14.

hardship; and (c) the relief requested may be granted without substantial detriment to the public good and without nullifying or substantially derogating from the intent or purpose of the bylaw. Exh. EV-3, at 14-15. It is difficult, if not impossible, to demonstrate the existence of unique conditions relating to soil conditions, shape or topography of a particular parcel of land or structure. Exh. EV-3, at 15. Moreover, variances are a legally disfavored form of relief and, even if granted, can be susceptible to appeal.[92] Exh. EV-3, at 15. Because of the legal uncertainty in obtaining variances, and the potential for adverse interpretations, delay, burden and undue expense associated with the permitting process and appeals therefrom, the Company seeks an exemption from the maximum height limitation in Section 2600 of the Sudbury Zoning Bylaw. Exh. EV-3, at 15.

**Performance Standards in Section 3400**. The Project requires exemptions from certain performance standards contained in the following sections:

- Section 3423: In order to minimize long-term disruption to abutters and to meet in-service deadlines for both the New Line and the modifications to the Sudbury Substation, the Company proposes to work Monday through Friday from 7:00 a.m. to 7:00 p.m. and Saturday from 9:00 a.m. to 5:00 p.m. Exhs. EV-3, at 15; EFSB-Z-19. Section 3423 limits construction hours to weekdays from 7:00 a.m. to 6:00 p.m., prohibits any use from causing nuisance or hazard to persons or property by reason of excessive noise generated therefrom and incorporates the standard of MassDEP set forth at 310 C.M.R. 7.10(1), which provides that no one shall willfully, negligently, or through failure to provide necessary equipment, service, or maintenance or to take necessary precautions cause, or permit unnecessary emissions of sound that may cause noise. Id. In order to minimize long-term disruption to abutters and to meet in-service deadlines for both the New Line and the modifications to the Sudbury Substation, the Company proposes to work weekdays until 7:00 p.m. and Saturdays from 9:00 a.m. to 5:00 p.m. To maintain

[92] The Company characterizes variances as "legally disfavored" because the Massachusetts Supreme Judicial Court has ruled that that they are to be issued sparingly and only if all of the statutory prerequisites have been met. Norcross v. Board of Appeal of the Building Department of the City of Boston, 255 Mass. 177, 185 (1926) ("[i]t is only in rare instances and under exceptional circumstances that relaxation of the general restrictions established by the statute ought to be permitted. The power granted is only for the relief of specific instances, peculiar in their nature"). This holding has been consistently reiterated in decisions of the courts regarding the issuance of variances. Guiragossian v. Board of Appeals of Watertown, 21 Mass. App. Ct. 111 (1985).

its proposed schedule, the Company would need a variance from the construction hour limitations in Section 3423 to work on Saturdays and to the extent that construction activities would not meet this standard, a variance would be required from the noise limitations in Section 3423. Exhs. EV-3, at 16; EFSB-Z-19.

- Section 3425: Among other things, this section provides that no vibration shall be detectable without instruments at any lot line of a residential or institutional use and that dust shall be confined to the premises. The Company cannot ensure that construction activities will meet these requirements. To the extent that the Project cannot meet these requirements, variances would be required. Exh. EFSB-Z-19.

  Section 3427: Subpart (a) of this section provides that changes to the natural topography be kept to "an absolute practical minimum" and that where tree coverage has been removed new plantings may be required. Topographic changes may occur in the creation of the construction platform and compliance with the topography standard is subjective. Moreover, some trees will need to be permanently removed in connection with the Project. Variances would be required from these provisions. These requirements of Subpart (a) would apply during both construction and operation of the Project. Exh. EFSB-Z-19.

  Subpart (c) of this section provides that the siting of all structures shall minimize disruption of the topography, facilitate natural surface drainage and be properly designed for particular site conditions. The construction of the access road and transmission line placement may change topography and the topography standard is subjective. The other standards likely were not drafted with an underground utility project in mind. To the extent that these provisions apply to the Project and the Project cannot comply, variances would be required. These requirements of Subpart (c) would apply during both construction and operation of the Project. Exh. EFSB-Z-19.

  Subpart (f) of this section provides particular standards for outdoor lighting and requires that all glare and light spilling onto neighboring properties be avoided. The Company will need to employ temporary outdoor lighting in connection with construction activities during extended work hours. Temporary lighting may be required at the Substation during construction and Substation lighting will be required for nighttime repairs during operation of the Substation. To the extent that these provisions apply to the Project and the Project cannot comply, variances would be required. Exh. EFSB-Z-19.

  Subpart (g) of this section provides that all utility structures and facilities shall be located or visually screened so as not to create hazards or visual or other nuisances. Whether the Substation with the proposed modifications is not screened so as to create visual or other nuisance is subjective. To the extent that the Project cannot comply with this standard, a variance would be required during operation of the Substation. Exh. EFSB-Z-19.

- Section 3430: The Project design has not advanced sufficiently to ensure that the Project will meet Sections 3431 and 3432 with regarding to grade of slopes. the Project will not be able to comply with Section 3433 of work along the MBTA ROW is considered a parcel or contiguous parcels in the same ownership as the Project will involve removal of vegetation to construct the access road and duct bank. The Project design has not advanced sufficiently to determine whether the vegetative cover requirements of Section 3436 will be met and the term "hillside" is not defined, and, thus, it is difficult to determine whether the provision applies to the Project. To the extent that the Project cannot comply with these provisions, variances would be required during construction and operation of the Project. Exh. EFSB-Z-19.

- Section 3440: The Project design has not advanced sufficiently to ensure that the Project will meet the standards in this provision which require, among others, that no excavation lower than the grade of any abutting road be nearer than 50 feet from such road boundary. Exh. EFSB-Z-19.

As described above, variances are a legally disfavored form of relief and, even if granted, can be susceptible to appeal. Exh. EV-3, at 16. Because of the legal uncertainty in obtaining variances, and the potential for adverse interpretations, delay, burden and undue expense associated with the permitting process and appeals therefrom, the Company seeks an exemption from the above-described performance standards contained in Section 3400 of the Sudbury Zoning Bylaw. Exh. EV-3, at 16; Exh. EFSB-Z-19.

The following table summarizes the individual zoning exemptions requested from the Sudbury Zoning Bylaw:

| Provision | Local Zoning Relief | Description of Zoning Relief Required |
|---|---|---|
| Section 2600 | Variance | The provision limits height to 35 feet; therefore, a variance is required for the proposed 100-foot shielding mast at the Sudbury Substation. |
| Section 3423 | Variance | The provision limits construction activity to weekdays from 7:00 a.m. to 6:00 p.m.; therefore, a variance would be required for the Company's proposed Saturday hours and for weekdays for an additional hour until 7:00 p.m. |

| Provision | Local Zoning Relief | Description of Zoning Relief Required |
|---|---|---|
| Sections 3423, 3425, 3427(a), (c), (f), (g), 3430, and 3440 | Variances | The provisions proscribe certain performance standards and to the extent that the Project will not meet the standards, variances would be required. |
| Section 2230 | Special permit | The provision allows Essential Services by special permit in all zoning districts; a special permit would be required to construct the New Line along the MBTA ROW. |
| Article 4200 | None available | The provision allows only uses in the Water Resource Protection Overlay District that are allowed in the underlying zoning districts. To the extent that this provision applies to uses allowed by special permit (and not just to those allowed as-of-right), a use variance would be required for construction of the New Line along the MBTA ROW in the overlay district. Use variances are allowed in limited circumstances, none of which applies here. |
| Section 4100 et seq. | Special permit or None Available | Section 4140 generally prohibits filling, excavation and construction in the Flood Plain Overlay District, which would necessitate obtaining a use variance; however, use variances are allowed in limited circumstances, none of which apply here. Upon the discretion of the Board of Appeals, a special permit may be granted upon making certain findings that would allow filling, excavation and construction in the overlay district. |

Exh. EV-3, at 18.

Eversource met with Sudbury zoning officials on February 14, 2018 to discuss pending permit applications and related zoning issues.[93] The Town is an active intervenor in the case and has not issued a letter of support for the Company's zoning exemption petition.

[93] At this meeting, the Company conferred with Town representatives regarding the Town's expectation for compliance with Section 4261, Part f, of the Sudbury Zoning Bylaw, which states that, "Fill material shall contain no solid waste, toxic or hazardous materials or hazardous waste." Town representatives stated their view that there is no acceptable threshold level for solid waste, toxic or hazardous materials or hazardous waste. Exh. RR-EFSB-69.

### 3. The Project Requires Individual Zoning Exemptions from the Operation of the Hudson Zoning Bylaw.

The New Line would traverse the Industrial (M-5 and M-6) and Single Residence (SA-8) zoning districts along public roads and the Industrial (M-6) and Single Residence (SA-8) zoning districts along the MBTA ROW in Hudson. Exh. EV-3, at 19. Based on the Company's review of the Hudson Zoning Bylaw, no local zoning relief is available for work proposed in the Water Protection District and, accordingly, a zoning exemption is *per se* required from the operation of those provisions. Exh. EV-3, at 20.

**Use**. Section 5.2 of the Hudson Zoning Bylaw sets forth the uses allowed in the Residential Districts and no use listed as "permitted" or "allowed by special permit" would appear to allow the New Line in the Single Residence district. Exh. EV-3, at 20. Accordingly, the use is impliedly prohibited in the Single Residence district and a use variance would be required to construct the New Line. Exh. EV-3, at 20. The Hudson Zoning Bylaw does not authorize the granting of use variances and, accordingly, no local zoning relief is available, and a zoning exemption is *per se* required for the New Line in the Single Residence district.[94] Exhs. EV-3, at 20; EFSB-Z-6.

**Use – Water Protection District**. Section 3.3.10 of the Hudson Zoning Bylaw establishes an overlay called the Water Protection District. Exh. EV-3, at 20. Uses not permitted in the portions of the districts so overlaid shall not be permitted within the Watershed Protection District. Exh. EV-3, at 20. Portions of the Single Residence zoning district through which the New Line would pass are overlain by the Water Protection District. Exh. EV-3, at 20. Because the New

[94] Sections 5.3 and 5.5 set forth the uses allowed in the Commercial and Industrial Districts. Exh. EV-3, at 20 n.6. In the Commercial District "… any lawful business, service or public utility" is allowed as-of-right. Exh. EV-3, at 20 n.6. Any use allowed in the Commercial District is allowed in the Industrial District. Accordingly, zoning relief does not appear to be required for the New Line in the Industrial (M-5 and M-6) districts. Exh. EV-3, at 20 n.6.

Line is not allowed in the Single Residence District, it is not allowed in the Watershed Protection District.[95] Exh. EV-3, at 20. Accordingly, a use variance is required to construct the New Line in the Water Protection District. Exh. EV-3, at 20. The Hudson Zoning Bylaw does not authorize the granting of use variances and, accordingly, no local zoning relief is available, and a zoning

[95] The Company notes that there are specific provisions of Section 3.3.10 from which the Company would need to seek exemption but for the Company's request for an exemption from all provisions of Section 3.3.10 because the Project is not allowed in the underlying zoning district. Exh. EFSB-Z-22. In particular, Section IV.2 prohibits any building, structure, land disturbing activities or excavations within 25 feet from the normal highwater line of all water bodies and watercourses within the watershed protection district. It is unclear if this prohibition includes activities within 25 feet of wetlands. Exh. EV-5, Section 3.3.10, IV. 2). Because the Project will include construction within 25 feet of certain wetland resource areas, an exemption from this provision is required to remove all doubt about its applicability to the Project. Section IV.4 prohibits soil removal within four feet of the historical high groundwater table elevation unless the soil is redeposited onsite to achieve a final grading greater than four feet above the historical highwater mark. Exh. EV-5, Section 3.3.10, IV. 4). There is an exemption for excavations for the installation of utility works, but it is unclear if the exemption applies to *transmission* lines. Id. The Town opined in its response to RR-EFSB-76 that the Project was exempt from this provision. Exh. RR-EFSB-76. The Company notes first that RR-EFSB-76 was submitted under the name of Pam Helinek. Ms. Helinek testified at the evidentiary hearing that she was employed by the Town of Hudson as "the conservation agent and a planner." Tr. 11, at 1947. As such, Ms. Helinek is not authorized to interpret the Hudson Zoning Bylaw and her opinion is not legally binding. Only the "Planning Board or its Agent shall be responsible for deciding the meaning or intent of any provision" of the Hudson Zoning Bylaw. Exh. EV-5, at § 7.1.7.10 (c). Moreover, it is the Company's experience that most zoning enactments are not drafted with transmission infrastructure in mind and the term "utility works" is usually intended by the drafters to mean distribution lines. To remove doubt about the applicability of these provisions, the Company would need an exemption. Finally, Section V 4) regulates the application of pesticides for non-agricultural uses in combination with erosion and sedimentation control plans by special permit. As noted herein, to grant a special permit, the Zoning Board of Appeals must find that a number of conditions are met, many of which are subjective. Exh. EV-3, at 17. Moreover, the grant of a special permit is discretionary, the standards are subjective and a special permit, if granted, would be susceptible to appeal. Exh. EV-3, at 17. Were a blanket exemption from all provisions of Section 3.3.10 not granted, as requested by the Company because the Project is not allowed in the underlying zoning district, the Company would still require exemption from these specific provisions.

exemption is *per se* required for the New Line in the Water Protection District.[96] Exhs. EV-3, at 20; EFSB-Z-22.

The following table summarizes the individual zoning exemptions requested from the Hudson Zoning Bylaw:

| Provision | Local Zoning Relief | Description of Zoning Relief Required |
|---|---|---|
| Section 5.2 | None Available | The Section does not authorize the New Line in the Single Residence District; the granting of use variances is not authorized by the Hudson Zoning Bylaw. |
| Section 3.3.10 | None Available | Uses not allowed in the Single Residence District are not allowed in the Water Protection District; the granting of use variances is not authorized by the Hudson Zoning Bylaw. |

Exh. EV-3, at 20.

Eversource met with Hudson Zoning officials to discuss the Company's approach to zoning on September 14, 2017. Exh. EFSB-Z-2(S-2). At the meeting, Eversource reviewed the zoning exemptions that were requested and the rationale for Eversource making the requested exemptions. Exh. EFSB-Z-2(S-2). Town officials did not express concerns specific to the zoning requests at that time. Exh. EFSB-Z-2(S-2).

[96] The Company hired a professional hydrogeologist who completed a detailed Groundwater Hydrology Assessment with regard to the Project's impact on the Town of Hudson's public water supply ("Assessment"). Exh. EFSB-Z-22; see Exhs. EV-2, Vol. II, Appendix 5-6; SUD-CM-58(S-1)(1). The Assessment concluded that Project would not have any appreciable effect on groundwater flow rates or directions, nor would it impact the yield of Hudson's municipal wells. Id. The Assessment recommended the development and implementation of a Spill Prevention and Response Plan to address Project construction equipment, fuels, lubricants and any other liquid or hazardous material that may be on-site during construction. Id. The design of the New Line will not involve any circulating coolant or other potential liquid contaminants. Exhs. EV-2, at 5-35; EFSB-Z-22. Moreover, the Company will develop and implement a SWPPP that includes spill protection controls and countermeasures to ensure that there are no impacts to groundwater in the event of a spill during construction. Id. The Company will prepare and implement the SWPPP in accordance with the U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System Construction General Permit. Id. Following construction of the Project, the Company expects that vegetation management will be carried out by DCR and will conform to the DCR Manual and all applicable state and federal permitting conditions and laws. Exhs. EV-2, at 5-16; EV-16, at 5-9; EFSB-LU-11; EFSB-LU-11(1); EFSB-LU-30; SUD-G-20(S3)(1).

4. The Project Requires Individual Zoning Exemptions from the Operation of the Stow Zoning Bylaw.

The New Line would traverse the Residential District along the MBTA ROW in Stowe. Exh. EV-3, at 21. Based on the Company's review of the Stow Zoning Bylaw, the Project would require one variance with regard to noise in order to construct the Project in Stow. In addition, no local zoning relief is available for the construction of the New Line along the MBTA ROW in Stow and, accordingly, a zoning exemption is *per se* required from the operation of that provision. Exh. EV-3, at 21.

**Use**. Section 3.10 of the Stow Zoning Bylaw, Table of Principal Uses, provides that "Public Service Corporation" use is allowed in the Residential District "in accordance with the provisions of M.G.L. Ch. 40A, Section 3." Exh. EV-3, at 21. To the extent that the intent of the provision is to allow public utility use only after the Department's grant of exemptions, a use variance would be required unless an exemption by the Department is granted. Exh. EV-3, at 21. The Stow Zoning Bylaw does not authorize the granting of use variances. Exhs. EV-3, at 21; EFSB-Z-5. Accordingly, an exemption is *per se* required for the New Line to be constructed in the Residential District. Exh. EV-3, at 21-22.

**Noise**. Section 3.8.1.3 of the Stow Zoning Bylaw regulates noise and provides that noise generated on any lot, measured at any point beyond the property lines of the lot on which the noise source is located, shall not cause the total sound level to be more than three decibels above the natural ambient sound level. Exh. EV-3, at 22. Construction activities could produce sound more than 3 dBA above ambient. Exhs. EV-3, at 22; EFSB-Z-8. To the extent that construction activities would not meet the standard in Section 3.8.1.3, a variance would be required. Exh. EV-3, at 22. As described above, variances are a legally disfavored form of relief and, even if granted, are susceptible to appeal. Exh. EV-3, at 22. Because of the legal uncertainty in obtaining

variances, and the potential for adverse interpretations, delay, burden and undue expense associated with the permitting process and appeals therefrom, the Company seeks an exemption from the noise limits contained in Section 3.8.1.3 of the Stow Zoning Bylaw. Exhs. EV-3, at 22; EFSB-Z-8.

The following table summarizes the individual zoning exemptions requested from the Stow Zoning Bylaw:

| Provision | Local Zoning Relief | Description of Zoning Relief Required |
|---|---|---|
| Section 3.10 | None available | The provision appears to allow the New Line in the Residential District only upon the grant of an exemption; the granting of use variances is not authorized under the bylaw. |
| Section 3.8.1.3 | Variance | The provision limits noise to 3 dBA above ambient and a variance would be required to exceed this limit. |

Exh. EV-3, at 22.

Eversource met with Stow Zoning officials to discuss the Company's approach to zoning on September 15, 2017. Exh. EFSB-Z-2(S-2). At the meeting, Eversource reviewed the zoning exemptions that were requested and the rationale for Eversource making the requested exemptions. Exh. EFSB-Z-2(S-2). Town officials did not express concerns specific to the zoning requests at that time. Exh. EFSB-Z-2(S-2).

5. The Project Requires Comprehensive Zoning Exemptions

The Company requests comprehensive exemptions from the operation of the Sudbury, Hudson and Stow Zoning Bylaws. Exh. EV-3, at 23. The grant of a comprehensive zoning exemption is based on the specifics of each case. Eversource Walpole-Holbrook at 98; Eversource Woburn at 41; NEP Salem at 99 citing Princeton Municipal Light Department, D.T.E./D.P.U. 06-11, at 37 (2007) ("Princeton 2007"). The Department and the Siting Board will consider a request for comprehensive zoning relief when issuance of a comprehensive exemption is imminently

needed to avoid substantial public harm. Eversource Walpole-Holbrook at 98; Eversource Woburn at 42; WMECO/NEP Northfield/Erving at 58; NEP Salem at 100; NSTAR Stoughton at 163.

The Department and the Siting Board have cited additional factors as relevant in making a determination whether to grant a comprehensive exemption, including, but not limited to, whether: (1) the project is needed for reliability; (2) the project is time sensitive; (3) there are multiple municipalities involved that could have conflicting zoning provisions that might hinder the uniform development of a large project spanning these communities; (4) the project proponent has actively engaged the communities and responsible officials to discuss the applicability of local zoning provisions and address local concerns; and (5) the communities affected by the project do not oppose the issuance of a comprehensive zoning exemption. Eversource Walpole-Holbrook at 98; Eversource Hopkinton at 42; WMECO/NEP Northfield/Erving at 58; NEP Salem at 100; Hampden County at 89-90; Western Massachusetts Electric Company, 18 DOMSB 7, EFSB-08-2/D.P.U. 08-105/08-106, at 136-37 ("GSRP Decision").

The grant of a comprehensive zoning exemption is necessary even where individual zoning exemptions are granted, as the two types of zoning exemptions serve distinct needs. Exh. EV-3, at 24. An individual zoning exemption relates to specific provisions in the Zoning Bylaws currently in effect that have the potential to conflict or be inconsistent with, prevent, delay or obstruct the construction or operation of the Project. Exh. EV-3, at 24. On the other hand, a comprehensive zoning exemption goes beyond the provisions in the current Zoning Bylaws (from which an individual zoning exemption may be granted), to exempt the Project from any *future* zoning enactment that comes into effect that has the potential to jeopardize the Project (in the same

manner described above for individual zoning exemptions).[97] Exh. EV-3, at 24-25. In this manner, the two types of zoning exemptions work in tandem to ensure that meritorious energy facilities like the Project are constructed as approved by the Siting Board without undue delay. Exh. EV-3, at 25. The very purpose of a comprehensive zoning exemption is thus to provide a mechanism for relief from local zoning that would not be available if only individual zoning exemptions were able to be secured. Exh. EV-3, at 25. A comprehensive zoning exemption would also ensure the timely construction of the Project in the event that a Project design change is required. Exh. EV-3, at 25.

As demonstrated throughout this proceeding, the Project satisfies the Department's and Siting Board's standards for the grant of a comprehensive zoning exemption. Exh. EV-3, at 25. The Project is necessary for system reliability, and the timing of the need for aspects of the Project is pre-2013 and, thus, imminent. Exh. EV-3, at 25. The Companies have actively engaged the responsible officials in the affected communities to discuss the applicability of local zoning provisions, the need for both the individual and comprehensive zoning exemptions and the Company's plans to seek exemptions from the Department/Siting Board. Id.

In sum, a comprehensive zoning exemption from the operation of the Sudbury, Hudson and Stow Zoning Bylaws would ensure the timely construction of this important reliability Project, which will directly benefit customers. Exh. EV-3, at 25.

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[97] A comprehensive zoning exemption is also necessary with regard to provisions currently in effect because zoning bylaws and ordinances are rarely written with unique energy infrastructure facilities in mind. Exh. EV-3, at 25. The lack of clearly defined and specific regulation of electric infrastructure in the Zoning Bylaws, and the vague and subjective terms and provisions of the Zoning Bylaws result in an imprecise, at best, application of the zoning provisions to the Project. Exh. EV-3, at 25. The Company interprets the provisions of zoning bylaws conservatively, in the hope that it is requesting individual zoning exemptions for all of the provisions that could conceivably be said to apply to a project. Exh. EV-3, at 25. The grant of a comprehensive exemption would remove any reasonable doubt as to the ability of the Project to move forward without violating any terms of the Zoning Bylaws. Exh. EV-3, at 25.

### D. Conclusion on Zoning Exemptions

For the foregoing reasons, the Company requests that, pursuant to G.L. c. 40A, § 3, the Siting Board determine that the construction of the Project is reasonably necessary for the convenience and welfare of the public, and grant: (1) exemptions from the particular provisions of the Sudbury, Hudson and Stow Zoning Bylaws described above; and (2) comprehensive exemptions from the provisions of the Sudbury, Hudson and Stow Zoning Bylaws, and take such other action as may be necessary and appropriate in connection with the Company's proposal to construct and operate the Project in the Towns.

## VII. THE PROJECT SATISFIES THE STANDARDS FOR SECTION 72 APPROVAL

As noted above, in evaluating petitions filed under Section 72, the Siting Board examines: (1) the need for, or public benefits of, the present or proposed use; (2) the environmental impacts or any other impacts of the present or proposed use; and (3) the present or proposed use and any alternatives identified. Eversource Mystic-East Eagle at 164; Eversource Walpole-Holbrook at 100-01; Eversource Mystic-Woburn at 84. The Siting Board then balances the interests of the general public against the local interest and determines whether the transmission line is necessary for the proposed purpose, will serve the public convenience and is consistent with the public interest. Id.

The Company's satisfaction of the Siting Board's standards pursuant to G.L. c. 164, §§ 69H, 69J similarly demonstrates compliance with the statutory standards of public convenience and necessity under Section 72. See Eversource Mystic-East Eagle at 164-65; Eversource Walpole-Holbrook at 101; Eversource Mystic-Woburn at 84. For the same reasons that the Siting Board should approve the Project under G.L. c. 164, § 69J, it should approve the Project under Section 72. See id.

Relatedly, on September 15, 2017, the Presiding Officer issued a Scoping Order regarding Property Values, in which he stated that "evidence concerning potential property value impacts associated Company's proposed transmission facility in this case may be presented by the parties for the limited purpose of the Siting Board's review of the general public interest relating to the Company's Section 72 and G.L. c. 40A, § 3 petitions." The Company's expert witness, James A. Chalmers, presented oral and written testimony that the Project, as proposed by the Company, would not result in a reduction in property values and that he is not aware of any studies that have been performed with respect to underground lines that have shown a negative property value effect. Exh. EV-JAC-1, at 4-5; Tr. 12, at 2127-2130. This evidence is uncontroverted in the record of this proceeding.

Accordingly, based upon the evidence and standards that are applicable to the Siting Board's review under Section 69J and the evidence and standards that apply to Section 72, the Siting Board should approve the Company's petition for approval to construct its proposed transmission line relating to the Project.

## VIII. CONCLUSION

For the foregoing reasons, Eversource respectfully requests that the Siting Board approve its request under G.L. c. 164, § 69J and G.L. c. 164, § 72 to construct, operate and maintain the Project and, pursuant to G.L. c. 40A, § 3, to grant the requested individual and comprehensive exemptions from the operation of the *Zoning Bylaw, Article IX, Town of Sudbury, Massachusetts* as amended through June 13, 2016; the *Town of Hudson Protective Zoning By-Law*s, as amended through February 28, 2017; and the *Town of Stow, Massachusetts Zoning Bylaw*, as amended through May 2, 2016.

Respectfully Submitted,

**NSTAR ELECTRIC COMPANY d/b/a EVERSOURCE ENERGY**

By its attorneys,

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