

**COMMONWEALTH OF MASSACHUSETTS  
ENERGY FACILITIES SITING BOARD**

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Petition of NSTAR Electric Company d/b/a	)	
Eversource Energy for Approval to Construct	)	
a New 115 kV Underground	)	EFSB 15-03
Transmission Line in Woburn, Winchester,	)	
Medford, Somerville, Everett and Boston	)	
Pursuant to G.L. c. 164, § 69J	)	
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Petition of NSTAR Electric Company d/b/a	)	
Eversource Energy for Approval to Construct	)	
Operate and Maintain a New 115 kV Underground	)	D.P.U. 15-64
Transmission Line in Woburn, Winchester,	)	
Medford, Somerville, Everett and Boston	)	
Pursuant to G.L. c. 164, § 72	)	
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Petition of NSTAR Electric Company d/b/a	)	
Eversource Energy for Individual Zoning	)	D.P.U. 15-65
Exemptions From the Zoning Ordinance	)	
of the City of Woburn Pursuant to G.L. c. 40A, § 3	)	
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**FINAL DECISION**

On the Decision:

Charlene de Boer  
Samrawit Dererie

Stephen H. August  
Presiding Officer  
March 13, 2017

APPEARANCES:

Catherine J. Keuthen, Esq.  
Cheryl A. Blaine, Esq.  
Keegan Werlin LLP  
265 Franklin Street  
Boston, MA 02110  
FOR: NSTAR Electric Company d/b/a  
Eversource Energy  
Petitioner

Theodore J. Paradise, Esq.  
ISO New England, Inc.  
One Sullivan Road  
Holyoke, MA 01040  
FOR: ISO New England, Inc.  
Intervenor

Frank D. Aronson, Esq.  
Posternak Blankstein & Lund LLP  
Prudential Tower  
800 Boylston Street  
Boston, MA 02199  
FOR: The Trustees of CC Industries Realty  
Company LLC  
MA Division of Capital Asset Management  
SWW Realty Company LLC  
Rockland Trust  
Intervenors

City of Somerville  
Mayor Joseph A. Curtatone  
City Hall, 93 Highland Ave.  
Somerville, MA 02143  
Intervenor

Michael Ruggiero  
18 Pembroke Street  
Medford, MA 02155  
Intervenor

Adam P. Kahn, Esq.  
Foley Hoag LLP  
Seaport West Boulevard  
Boston, MA 02210

FOR: New Hampshire Transmission, LLC  
Limited Participant

The Friends of Medford Community Gardens  
265A Boston Ave.  
Medford, MA 02155  
Limited Participant

Amy and Steve Maguire  
3 Madison Ave. West  
Winchester, MA 01890  
Limited Participant

Wade M. Welch, Esq.  
Welch & Donohoe, LLP  
655 Summer Street, Suite 203  
Boston, MA 02210

FOR: Town of Winchester  
Limited Participant

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ABBREVIATIONS<sup>1</sup>

AC	alternating current
ACEC	areas of critical environmental concern
ACOE	U.S. Army Corps of Engineers
<u>Brockton Power</u>	<u>Brockton Power LLC</u> , 10 DOMSB 157, EFSB 99-1 (2000)
CELT	Capacity, Energy, Loads, and Transmission
CMR	Code of Massachusetts Regulations
Company	NSTAR Electric Company d/b/a Eversource Energy
CO <sub>2</sub>	carbon dioxide
dBa	A-weighted decibels
Department	Massachusetts Department of Public Utilities
DCR	Massachusetts Department of Conservation and Recreation
DOMSB	Decisions and Orders of Massachusetts Energy Facilities Siting Board
DR	demand response
EE	energy efficiency
EFSB	Energy Facilities Siting Board
EMF	electric and magnetic fields
Existing Line	the 211-514 cables between Woburn and Mystic Substations
FCA	Forward Capacity Auction
<u>Footprint Power</u>	<u>Footprint Power Salem Harbor Development LP</u> , 19 DOMSB 151, EFSB 12-2 (2013)
GHG	greenhouse gas
GIS	geographic information system
G.L. c.	Massachusetts General Laws chapter

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<sup>1</sup> The citations in this Decision to past Siting Board decisions reference the page numbers to be found in the original decisions rather than the page numbers in the DOMSC and DOMSB volumes. DOMSC and DOMSB citation references are provided only the first time that a case is mentioned in the Decision.

<u>Hampden County</u>	<u>New England Power Company d/b/a National Grid and Western Massachusetts Electric Company</u> , 18 DOMSB 323, EFSB 10-1/D.P.U. 10-107/10-108 (2012)
HCA	host community agreement
HDD	horizontal directional drilling
HPFF-PTC	high pressure fluid-filled pipe-type cable
HVDC	high voltage direct current
<u>IRP</u>	<u>New England Power Company d/b/a National Grid</u> , 20 DOMSB 1, EFSB 12-1/D.P.U. 12-46/12-47 (2014)
ISO-NE	ISO New England, Inc.
kV	kilovolts
LEI	London Economics International LLC
LOS	level of service
<u>Lower SEMA</u>	<u>NSTAR Electric Company</u> , 19 DOMSB 1, EFSB 10-2/D.P.U. 10-131/10-132 (2012)
LTE	long-time emergency rating
MassDEP	Massachusetts Department of Environmental Protection
MassDOT	Massachusetts Department of Transportation
MBTA	Massachusetts Bay Transportation Authority
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
mG	milligauss
MVA	megavolt-amperes
MW	megawatts
MWh	megawatt-hours
MVRP	<u>New England Power Company d/b/a National Grid</u> , D.P.U. 15-44/15-45 (2016)
NEMA	northeastern Massachusetts
NERC	North American Electric Reliability Corporation
New Line	Underground transmission line between Woburn Substation and Mystic Substation in Everett
NHESP	National Heritage and Endangered Species Program

NHT	New Hampshire Transmission
NOI	Notice of Intent
NPCC	Northeast Power Coordinating Council
<u>NSTAR/Stoughton</u>	<u>NSTAR Electric Company</u> , 14 DOMSB 233, EFSB 04-1/D.T.E. 04-5/04-7 (2005)
NTA	non-transmission alternative
<u>NY Central Railroad</u>	<u>New York Central Railroad v. Department of Public Utilities</u> , 347 Mass. 586 (1964)
ORW	Outstanding Resource Waters
P <sub>max</sub>	maximum size of modeled NTA resources
Proposed Variation	a short alternative segment of the Primary Route that avoids Assembly Square area in Somerville
PV	photovoltaic
ROW	right-of-way
<u>Salem Cables</u>	<u>New England Power Company d/b/a National Grid</u> , 20 DOMSB 129, EFSB 13-2/D.P.U. 13-151/13-152 (2014)
<u>Save the Bay</u>	<u>Save the Bay v. Department of Public Utilities</u> , 366 Mass. 667 (1975)
Section 72 Petition	Eversource Energy petition pursuant to G.L. c. 164, § 72
SEMA/RI	southeastern Massachusetts/Rhode Island
SF <sub>6</sub>	sulfur hexafluoride
Siting Board	Massachusetts Energy Facilities Siting Board
STE	short-time emergency rating
TMP	traffic management plan
USEPA	U.S. Environmental Protection Agency
<u>Westborough</u>	<u>New England Power Company d/b/a National Grid</u> , D.P.U. 12-02 (2012)
WCMA	western central Massachusetts
WHO	World Health Organization
WPA	Massachusetts Wetlands Protection Act
<u>Woburn Substation</u>	<u>NSTAR Electric Company d/b/a Eversource Energy</u> , D.P.U. 15-85 (2016)
Working Group	a group of ISO-NE staff and electric transmission company staff



XLPE cross-linked polyethylene-insulated (cable)

Zoning Petition Eversource Energy petition pursuant to G.L. c. 40A, § 3

Pursuant to G.L. c. 164, § 69J, the Massachusetts Energy Facilities Siting Board (“Siting Board”) hereby approves, subject to the conditions set forth below, the Petition of NSTAR Electric Company d/b/a Eversource Energy to construct a new approximately 7.7-mile-long 115 kilovolt underground transmission line in Woburn, Winchester, Medford, Somerville, Boston, and Everett, Massachusetts. Pursuant to G.L. c. 164, § 72, the Siting Board hereby approves, subject to the conditions set forth below, the Petition of Eversource for a determination that the proposed 115 kV transmission line is necessary, serve the public interest, and is consistent with the public interest. Pursuant to G.L. c. 40A, § 3, the Siting Board hereby approves, subject to the conditions set forth below, the Petition of Eversource for individual zoning exemptions from the Woburn Zoning Ordinance in connection with necessary improvements to the Woburn Substation associated with the proposed transmission facilities, as described herein.

## I. INTRODUCTION

### A. Description of the Proposed Project

NSTAR Electric Company d/b/a Eversource Energy (“Eversource” or “Company”) proposes to construct a new approximately 7.7 mile-long 115 kilovolt (“kV”) underground transmission line between the Company’s Woburn Substation in Woburn, Massachusetts, and its Mystic Substation in Everett, Massachusetts (the “New Line”). The New Line would operate in parallel with, and supplement the capacity of, the Company’s existing 211-514 line (the “Existing Line”), which is a 115 kV underground transmission line that runs between the Woburn and Mystic Substations (Exhs. EV-1, at 1-6; EFSB-G-15). Eversource stated that the two parallel lines would operate as a single circuit, and would effectively be a single larger-capacity transmission line (Exh. EFSB-G-15; Tr. 1, at 108-109). The Company also proposes to install a new air-core series reactor at the Woburn Substation to balance power flows between the Existing Line and the New Line, and to modify the connection arrangement of the Existing Line and the 115 kV 488-518 transmission line within the Mystic Substation to accommodate connection of the New Line (together, the “Project”) (Exh. EV-1, at 1-11). The

Company's most recent estimate for the cost of the Project is \$81.5 million, which is expected to be in-service by December 2018 (id. at 1-16; Exh. EFSB-C-1(Supp)).<sup>2</sup>

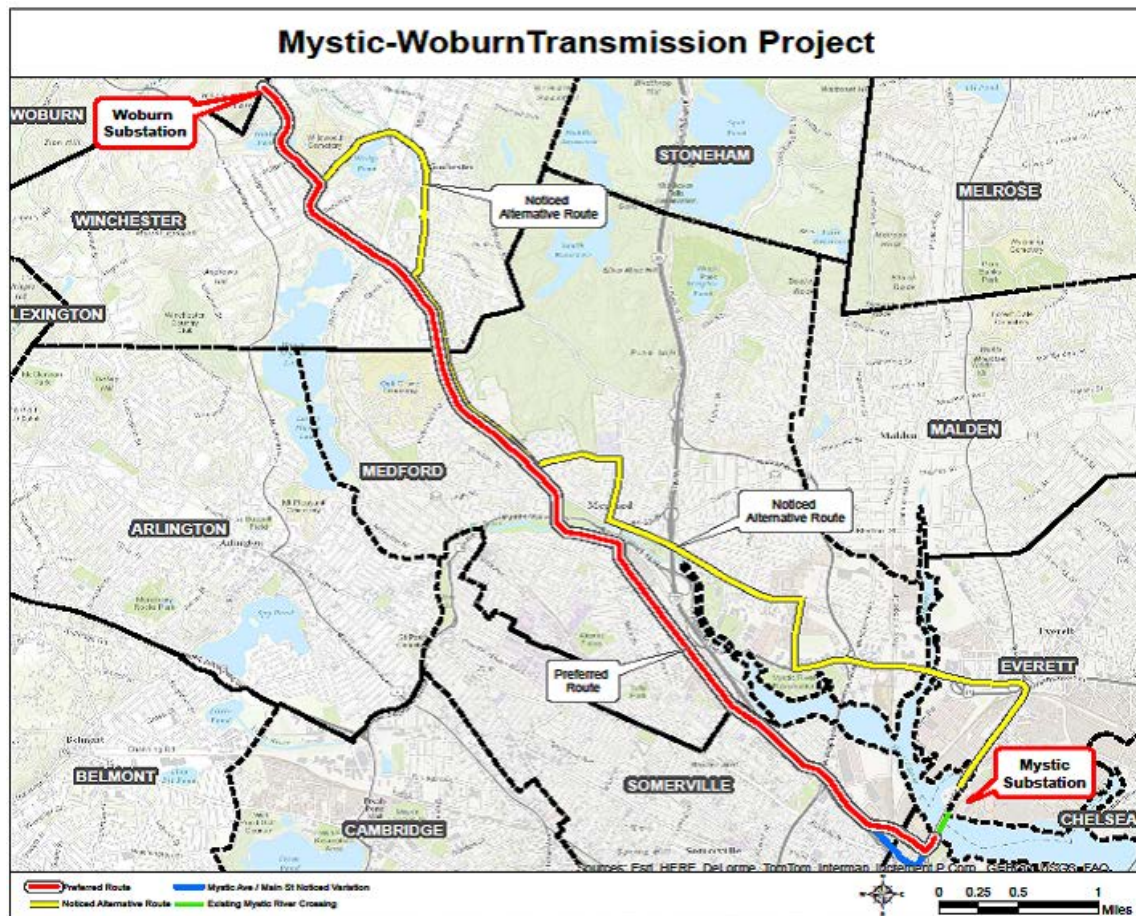
The Company's Primary Route for the New Line exits the Woburn Substation at the Winchester town line and travels primarily under streets for approximately 7.2 miles, parallel to the Existing Line, through Winchester, Medford, Somerville, and the Charlestown section of Boston, and then an additional 0.5 miles within an existing pipe under the Mystic River to the Mystic Substation fence line in Everett (Exh. EV-1, at 6-9). In addition to traveling within an existing pipe under the Mystic River, the Primary Route crosses the Aberjona River in Winchester and the Mystic River in Medford (Exh. EV-1, at 6-30).

The Company also presented a Noticed Alternative Route for the Project from the Woburn Substation to Mystic Substation. The Noticed Alternative Route would be located primarily in streets for approximately 9.1 miles in the municipalities of Winchester, Medford, Everett, and a small portion of roadway in Boston on the Everett side of the Mystic River (id. at 6-10 and Figure 5-9). The Noticed Alternative Route crosses Winter Pond and the Aberjona River in Winchester as well as the Malden River between Medford and Everett. The Company's Primary Route and Noticed Alternative Route are shown in Figure 1, below. In addition, as described further in Section V.B, during the course of the proceeding, the Company presented an additional variation to the Primary Route (the Proposed Variation).<sup>3</sup>

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<sup>2</sup> After evidentiary hearings had concluded the Company upgraded its original \$75 million conceptual grade cost estimate (-25 percent to +50 percent) to a planning grade estimate of \$81.5 million with a target accuracy of -25 percent to +25 percent (Exh. EFSB-C-1 (Supp)).

<sup>3</sup> The Proposed Variation follows a similar route to a previously noticed Company variation of the Company's Primary Route. Although the Proposed Variation was developed during the proceeding, and was not described in the Company's published notice (which was mailed to abutters and abutters to abutters within 300 feet), the Company reports that all direct and indirect abutters to the Proposed Variation received the published notice because of their proximity to the Primary and/or Noticed Alternative Routes (Company Brief at 57, n. 34, citing Tr. 2, at 201-202). In addition, the Company is in ongoing discussions with direct abutters to the Proposed Variation about the route (see RR-EFSB-12(S-1)).

**Figure 1. Primary and Noticed Alternative Routes**

See Exh. EV-2, figure 5-3.

## B. Procedural History

On May 20, 2015, Eversource filed three petitions with the Siting Board and the Massachusetts Department of Public Utilities ("Department") relating to the Project. In these petitions, the Company seeks: (1) approval of the Project pursuant to G.L. c. 164, § 69J ("Siting Petition"); (2) approval of the Project pursuant to G.L. c. 164, § 72 ("Section 72 Petition"); and (3) individual exemptions from the zoning bylaws of the City of Woburn for the Project pursuant to G.L. c. 40A, § 3 ("Zoning Petition") (together, "Petitions").

The Siting Petition was docketed as EFSB 15-03, the Section 72 Petition as D.P.U. 15-64, and the Zoning Petition as D.P.U. 15-65. Pursuant to the Company's motion, on

May 22, 2015, the Chairman of the Department issued a Consolidation Order, referring the Section 72 and Zoning Petitions for review and approval or rejection to the Siting Board pursuant to G.L. c. 164, § 69H(2). The consolidated proceeding was docketed as EFSB 15-03/D.P.U. 15-64/15-65. The Siting Board conducted a single adjudicatory proceeding and developed a single evidentiary record for the consolidated Petitions.

Pursuant to the Presiding Officer's instructions, the Company published the Notice of Public Hearing/Notice of Adjudication ("Public Hearing Notice") for the Project once per week for two consecutive weeks, in English in the Boston Globe and in Spanish in El Planeta. The Presiding Officer also directed the Company to place copies of the Public Hearing Notice and a brief summary sheet (each in English, Spanish, and Portuguese), and the Petitions in the municipal clerks' offices and public libraries in Woburn, Winchester, Medford, Somerville, Everett, and Boston. In addition, the Presiding Officer directed the Company to send by first class mail, the Public Hearing Notice and summary page (each in English, Spanish and Portuguese) to the property owners abutting the proposed right-of-way ("ROW") for the Primary Route and the Noticed Alternative Route, and to abutters to the abutters within 300 feet of the property line. Based on linguistic data regarding the population in the Project area and surrounding communities, the Presiding Officer arranged for the services of a translator for any Spanish- and Portuguese-speaking attendees at the public comment hearing desiring such assistance.

The Siting Board conducted a public hearing in Medford on July 15, 2015. Commenters raised a variety of issues including the potential traffic impacts during construction, the narrowness of the roads along the Primary Route and the comparative benefits of choosing the Noticed Alternative Route, potential health risks from the transmission line associated with magnetic fields, and environmental impacts associated with river crossings.

The Presiding Officer's ruling of August 21, 2015 granted intervenor status to: ISO New England ("ISO-NE"); CC Industries Realty Company LLC, and its tenant MA Capital Asset Management and Maintenance; SWW Realty Company LLC, and its tenant Rockland Trust; the City of Somerville; and Michael Ruggiero. Limited Participant status was granted to New Hampshire Transmission LLC; The Friends of Medford Community Gardens; and

Amy and Steve Maguire. On April 11, 2016, the Town of Winchester was also granted Limited Participant Status.

The Company presented the testimony of the following eleven witnesses in support of the Petitions: David Velez, lead project manager; Elizabeth J. Leonard, senior engineer; John Zicko, director of substation and overhead transmission line engineering; Joseph Mayall; manager of project management; Michael J. Zylich, senior environmental engineer; Demetrios Sakellaris; underground transmission line engineer; Daniel Rukakoski, principal environmental scientist; Steven Damiano, senior consultant/project manager, Power Engineers, Inc.; Peter Valberg, principal at Gradient; Julia Frayer, managing director, London Economics International, LLC (“LEI”); and Michael Sutton, traffic management project manager, Vanasse Hangen Brustlin, Inc.

The Siting Board conducted four days of evidentiary hearings during January 20, 2016 to March 9, 2016. The Company filed a brief on June 24, 2016. Siting Board staff prepared a Tentative Decision and distributed it to Siting Board members and all parties and limited participants for review and comment on February 24, 2017. The parties were given until March 3, 2017 to file written comments on the Tentative Decision. Written comments were received from the Company, the City of Somerville, and the Town of Winchester, and late-filed comments were received from the City of Medford. The Siting Board conducted a public meeting to consider the Tentative Decision on March 9, 2017, at which the parties and limited participants were invited to present oral comments to the Siting Board. Comments were presented by the Company and the Town of Winchester. After deliberation, the Board directed staff to draft a Final Decision approving the Petitions, subject to the conditions set forth below.

## II. JURISDICTION AND STANDARD OF REVIEW UNDER G.L. C. 164, § 69J

G.L. c. 164, § 69J provides that the Siting Board should approve a petition to construct if the Siting Board determines that the petition meets certain requirements, including that the plans for the construction of the applicant’s 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 lowest possible cost. Pursuant to G.L. c. 164, § 69J, a project

applicant must obtain Siting Board approval for the construction of proposed energy facilities before a construction permit may be issued by another state agency.

G.L. c. 164, § 69G defines a “facility” to include “a new electric transmission line having a design rating of 115 kilovolts or more which is ten miles or more in length on an existing transmission corridor, except [for] reconductoring or rebuilding of transmission lines at the same voltage” or “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.” The proposed 115 kV transmission line is clearly a “facility” with respect to Section 69J, and therefore, the Project is subject to Siting Board review under Section 69J.

The Siting Board requires that an applicant demonstrate that its proposal meets the following requirements: (1) that additional energy resources are needed (see Section III, below); (2) that, on balance, the proposed project is superior to alternative approaches in terms of reliability, cost, and environmental impact, and in its ability to address the identified need (see Section IV, below); (3) that the applicant has considered a reasonable range of practical facility siting alternatives and that the proposed facilities are sited in locations that minimize costs and environmental impacts (see Section V, below); (4) that environmental impacts of the project are minimized and the project achieves an appropriate balance among conflicting environmental concerns as well as among environmental impacts, cost, and reliability (see Section VI, below); and (5) that plans for construction of the proposed facilities are consistent with the current health, environmental protection and resource use and development policies of the Commonwealth (see Section VII, below).

### III. NEED FOR THE PROPOSED PROJECT

#### A. Standard of Review

The Siting Board reviews the need for proposed transmission facilities to meet reliability, economic efficiency, or environmental objectives. G.L. c. 164, §§ 69H, 69J. When demonstrating the need for a proposed transmission facility based on reliability considerations, a petitioner applies its established planning criteria for construction, operation, and maintenance of its transmission and distribution system. Compliance with the applicable planning criteria can

demonstrate a “reliable” system. New England Power Company d/b/a National Grid, 20 DOMSB 129, EFSB 13-2/D.P.U. 13-151/13-152 (2014) (“Salem Cables”); New England Power Company d/b/a National Grid, EFSB 12-1/D.P.U. 12-46/12-47, at 5 (2014) (“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 (2012) (“Hampden County”).

Accordingly, to determine whether system improvements are needed, the Siting Board:

- (1) examines the reasonableness of the petitioner’s system reliability planning criteria;
- (2) determines whether the petitioner uses reviewable and appropriate methods for assessing system reliability over time based on system modeling analyses or other valid reliability indicators; and
- (3) determines whether the relevant transmission and distribution system meets these reliability criteria over time under normal conditions and under certain contingencies, given existing and projected loads. Salem Cables at 6-7; IRP at 5; Hampden County at 5.

When a petitioner’s assessment of system reliability and facility requirements is, in whole or in part, driven by load projections, the Siting Board reviews the underlying load forecast. 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. See G.L. c. 164, § 69J. To ensure that this standard has been met, the Siting Board requires that forecasts be reviewable, appropriate and reliable. 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. A forecast is considered reliable if its data, assumptions and judgments provide a measure of confidence in what is most likely to occur. Salem Cables at 7; IRP at 5-6; Hampden County at 6.

#### B. Description of the Company’s Demonstration of Need

As part of its role as the independent system operator of New England, ISO-NE administers the Regional System Planning Process, wherein it conducts periodic needs assessments on a system-wide or specific-area basis, and develops an annual regional transmission plan using a ten-year planning horizon (RR-EFSB-5). ISO-NE recently issued one



such assessment, the “Greater Boston Area Updated Transmission Needs Assessment” (Exh. EV-3, app. 2-1). The Company’s assertion of need for the Project is based extensively on this ISO-NE assessment – including the planning criteria and standards, and demand forecast contained within – and is described below.

1. Greater Boston Area Transmission Needs Assessment

The Existing Line is located within the broader transmission area referred to as the “Greater Boston Area” (Exh. EV-1, at 2-2). This area generally includes communities north and east of Interstate 495 up to the New Hampshire border, Boston itself, and some of the suburbs south of Boston (Exh. EV-3, app. 2-1, at 1). In 2008, ISO-NE established a working group including members from ISO-NE and local electric utilities (“Working Group”) to identify and address performance issues affecting the transmission system serving the Greater Boston Area (id. at 2).<sup>4</sup>

Eversource stated that the Working Group completed its initial assessment of the reliability needs of the Greater Boston Area in July 2009, and that a number of subsequent updates to this assessment were required in order to reflect significant changes on the transmission system (Exh. EV-1, at 2-1 to 2-2). The most recent needs assessment was issued in January 2015 (“2015 Needs Assessment”) (id. at 2-3). According to the Company, this assessment evaluated the reliability performance of the transmission system serving the Greater Boston Area under 2018 and 2023 projected system conditions, and assessed the system for compliance with planning standards and criteria established by the North American Energy Reliability Corporation (“NERC”), the Northeast Power Coordinating Council (“NPCC”), and ISO-NE (id. at 2-5).

According to Eversource, NERC Reliability Standards require that the system thermal and voltage levels remain within applicable limits following representative contingencies

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<sup>4</sup> Specifically, the Working Group defined the Greater Boston Area as including all of the Northeast Massachusetts (“NEMA”) load zone, and portions of the New Hampshire, Southeastern Massachusetts (“SEMA”) and Western/Central Massachusetts (“WCMA”) load zones (Exh. EV-3, app. 2-1, at 12).

(RR-EFSB-5). If a transmission operator's system does not have sufficient capability to serve forecasted load under those contingencies, the Company is expected to plan and implement system additions and upgrades to address the identified inadequacies (Exh. EV-1, at 2-5 to 2-6, 3-1). A single contingency, known as an "N-1" contingency, is a circumstance in which there is an unexpected fault or loss of a single electric element (including the transmission tower of a double-circuit transmission line) (id. at 2-5 to 2-6). If, after the first contingency has occurred, a second non-related transmission or generation outage follows, the two contingencies together are known as an "N-1-1" contingency (id. at 2-6). For the transmission system to meet the established reliability criteria, there cannot be any instances of equipment exceeding its Long-Time Emergency ("LTE") or Short-Time Emergency ("STE") rating, or unacceptably low voltages following an N-1 or N-1-1 contingency event (id.).

a. Load Forecast Methodology

Eversource stated that the 2015 Needs Assessment relied on the summer peak 90/10 load forecast from the 2013 Capacity, Energy, Loads, and Transmission ("CELT") Report to develop the 2018 and 2023 load levels for the Greater Boston Area (Exh. EV-3, app. 2-1, at 19, 31-32).<sup>5</sup> Demand response ("DR") resources that had cleared Forward Capacity Auction 7 ("FCA 7"), and energy efficiency ("EE") resources, as forecast in the 2014 CELT Report, were modeled as reductions to establish the net demand for the Greater Boston Area (id.).<sup>6,7</sup> According to

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<sup>5</sup> The Company did not develop a separate load forecast for the purposes of assessing reliability needs associated with the Existing Line, but rather adopted the 2015 Needs Assessment load forecast for the purposes of establishing the need for the Project (Tr. 1, at 33-34).

<sup>6</sup> In response to questions from staff, Eversource provided information on any changes to the New England 90/10 load and EE forecasts included in the 2015 CELT Report, as well as any generation or DR that had received a contract supply obligation ("CSO") since FCA 7 (Exhs. EFSB-N-2; EFSB-N-3). The Company identified an increase of roughly 15 megawatts ("MW") in generation availability, and a small decrease (roughly four to five percent) in the Greater Boston Area net load (Exhs. EFSB-N-2; EFSB-N-3). The Company stated that these changes were insignificant, especially in light of the pre-2013 need date identified for the Project, as discussed further in Section II.B.1.c, below (Exhs. EFSB-N-2; EFSB-N-3).

ISO-NE, the CELT Report contains a ten-year econometric forecast that is used as a source of assumptions for all ISO-NE electric planning and reliability studies (id., app. 2-4, at 2; Tr. 1, at 22-26). ISO-NE further stated that this forecast is updated annually, and takes into consideration factors such as regional economic indicators (e.g., predictions of gross state product as provided by Moody's Analytics, Inc.), as well as significant local load developments (e.g., large customer connection requests as provided by the utilities) (Tr. 1, at 22-23).

Eversource indicated that ISO-NE forecasted an annual growth rate of 1.4 percent for New England summer peak load as part of its 2015 Updated Needs Assessment (Exh. EFSB-N-8). That growth rate is slightly lower than Greater Boston's historical annual load growth rate of 1.6 percent calculated by the Company for the period 1994 to 2015, which included the 2008 recession (Tr. 1, at 32; RR-EFSB-2). The Company stated that small changes in forecast load growth rates would not affect the need for the Project (Exhs. EV-1, at 2-8; EFSB-N-2; Tr. 1, at 42).

b. Base Cases Assessed

Eversource stated that for each of the two study years (2018 and 2023), the 2015 Needs Assessment evaluated 37 generation dispatch cases, which represented a range of possible generation dispatch and availability scenarios, under summer peak load conditions (Exh. EV-1, at 2-8; Tr. 1, at 37). The 37 generation dispatch cases were organized by surrounding interface transfer levels and included base case conditions with: (1) high north-to-south flows (power flowing from northern New England into southern New England) along with high southeastern

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<sup>7</sup> The Company stated that projected future growth in solar photovoltaic ("PV") resources was not considered in the development of the 2015 Needs Assessment demand forecast (Exh. EFSB-N-6). In response to questions from staff, Eversource provided an estimate of the contribution from solar PV to the Greater Boston Area for the years 2018 and 2023 based on the ISO-NE Final 2015 Solar PV forecast, which indicated 15.5 percent of Massachusetts PV development would be located in the Greater Boston Area (id.). According to the Company, these PV resources would contribute approximately 39 MW of effective capacity by 2018, and 45 MW by 2023, which is less than one percent of the Greater Boston Area load, and would have no significant effect on the reliability needs identified in the 2015 Needs Assessment or on the need for the Project (id.).

Massachusetts/Rhode Island (“SEMA/RI”) flows (power flowing out of SEMA/RI to the north and west); (2) high north-south flows with low flows out of SEMA/RI; and (3) low north-south flows with high flows out of SEMA/RI (Exh. EV-1, at 2-9; Tr. 1, at 15-17). Transfer levels on the Hydro-Québec Phase II Import interface were modeled as ranging between zero megawatts (“MW”) (where no power was imported) up to a maximum of 2,000 MW of imports (Exhs. EV-3, app. 2-1, at 22; EFSB-N-11). Together, these base cases were categorized as “Design Cases” (where one or two major generating units were assumed to be out of service) or “Retirement Sensitivity Cases,” where the retirement of the 1975-vintage Mystic 7 unit is assumed, along with two additional major generating units (Mystic 8 and 9) out of service (Exh. EV-1, at 2-9). ISO-NE stated that a proposed solution must be developed to address any planning standard or criteria violations identified in the Design Cases, whereas the Retirement Sensitivity Cases were used to assess the robustness of a proposed solution in light of potential future generator retirements (id.; Exh. EV-3, app. 2-3, at 31-32).

c. Greater Boston Area Reliability Needs

According to the Company, the 2015 Needs Assessment identified numerous reliability concerns throughout the Greater Boston Area, including a number of thermal and voltage violations following certain N-1 and N-1-1 contingencies (Exh. EV-1, at 2-10 to 2-12).<sup>8</sup> Eversource stated that by 2023, post-contingency overloads were observed across the 69 kV, 115 kV, and 345 kV transmission facilities within the Greater Boston Area, and that the system was susceptible to these overloads at peak load levels prior to 2013 (id.). The Company noted that Retirement Sensitivity Case post-contingency overloads were similar to the Design Case violations in terms of the overloaded elements identified, but were, in general, more severe than the Design Case results (id. at 2-10).

Eversource stated that given the broad geographic area included in the 2015 Needs Assessment and its electrical complexity, the Working Group divided the Greater Boston Area into a number of sub-areas based on the reliability needs identified (id. at 2-6). Figure 2, below,

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<sup>8</sup> The ISO-NE study identified no criteria violations under N-0 (all facilities in service) conditions (Exh. EV-3, app. 2-1, at 48).

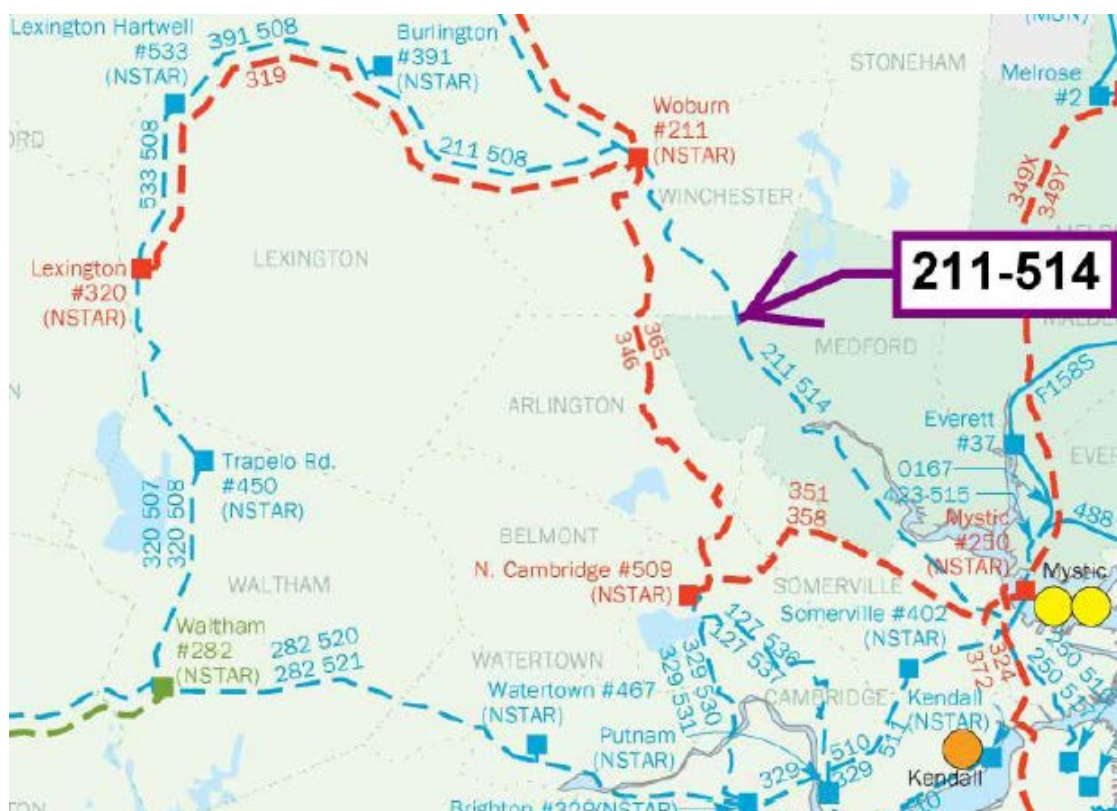
**Figure 2. Greater Boston Sub-Areas of Concern as Presented by the Company**



The Working Group identified Sub-Area B (labeled as “115/345 kV Outages – Overload Lines in the Waltham, Woburn and Lexington Area” in Figure 2, above, and shown in more detail in Figure 3, below) as one of the areas of concern (Exh. EV-1, at 2-6 to 2-7). Sub-Area B contains five 345 kV transmission lines and eight 115 kV transmission lines that connect a number of Company-owned substations (Exhs. EV-1, at 3-1 to 3-2; EFSB-G-13). Eversource identified two key substations in Sub-Area B: (1) the Woburn Substation, which receives 345 kV power from the north and distributes it across the 345 kV and 115 kV transmission systems towards Burlington and Lexington to the west, and Waltham, North Cambridge, and

Mystic Substations to the south; and (2) the Mystic Substation, which also connects the 345 kV and 115 kV transmission systems, and is the connection point for Sub-Area B's three large electric generating units, Mystic 7, 8, and 9 (Exhs. EV-1, at 3-2; EFSB-G-13; Tr. 1, at 10-11). According to the Company, when these generators are operating, power flows on some of the transmission lines in Sub-Area B may reverse, such that power flows away from the Mystic Substation toward the Woburn Substation (Tr. 1, at 12).

**Figure 3. Map of the Existing Transmission System in Sub-Area B**



Note: The area presented is an approximation of the Sub-Area B boundaries and contains some transmission facilities outside of the Sub-Area B (e.g., in downtown Boston). Eversource's 345 kV and 115 kV transmission lines are shown as dashed red and blue lines, respectively, on this figure. National Grid facilities are shown as solid lines.

See Exh. EV-1, at 3-2; Tr. 1, at 12.

According to the Company, the 2015 Needs Assessment identified a number of reliability needs across Sub-Area B including: (1) post-contingency thermal overloads on the Woburn Substation 345/115 kV autotransformer, the 345 kV transmission lines 351/358 and 346/358, the

115 kV transmission lines 533-508, 282-520/521, and the Existing Line; and (2) high- and low-voltage violations at numerous area substations (Exh. EV-3, app. 2-1, at 51; Tr. 1, at 40-41).

Focusing solely on the thermal overloads associated with the Existing Line that would not be addressed by investments designed to resolve reliability needs elsewhere in Sub-Area B, Eversource stated that the Working Group identified more than 160 N-1-1 thermal overloads on the Existing Line in the 2018 and 2023 peak-load Design Cases, with worst case overloads exceeding 200 percent of the line's LTE rating, and 130 percent of the line's STE rating (Exh. EV-1, at 3-3; RR-EFSB-4). The Company stated that these overloads would occur under a variety of different power flow and contingency conditions (Exhs. EV-1, at 3-3; EFSB-N-17). For example, overloads would occur with power flowing from the Woburn Substation towards the Mystic Substation following an N-1-1 contingency involving a 115 kV transmission line near Wakefield Junction Substation and a generator unit at Mystic Substation, but overloads would also occur with power flowing from the Mystic Substation towards the Woburn Substation following an N-1-1 contingency in the Woburn area (Exh. EV-1 at 3-3). According to the Company, if one of the N-1-1 contingencies of concern were to take place during peak load conditions, the supply of power to customers in Sub-Area B and in Sub-Area F<sup>9</sup> would be interrupted (Tr. 1, at 44-45).

Eversource stated that the 2015 Needs Assessment found that the Existing Line first failed to meet criteria under N-1-1 contingency conditions prior to 2013 (Exh. EV-1, at 3-4). Accordingly, the Company stated that there is an immediate need for transmission system upgrades in the area served by the Existing Line, and that this need is not dependent on load growth in the Greater Boston Area (id.; Tr. 1, at 41-42).

## 2. ISO-NE Greater Boston Area Solutions Study

On August 12, 2015, ISO-NE issued the Final Solutions Study for the Greater Boston Area ("Solutions Study"), outlining the recommended transmission investments for addressing

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<sup>9</sup> The Company described Sub-Area F as the "North Shore" area served by National Grid, including Everett, Revere, Lynn, Medford and the Wakefield-Melrose area (Tr. 1, at 13-15, 44-45).

the reliability needs identified in the 2015 Needs Assessment (Exh. EV-3, app. 2-3). In the Solutions Study, ISO-NE assessed two broad sets of transmission solutions: (1) an “AC Plan,” which is a package of alternating current (“AC”) transmission projects; and (2) an “HVDC Plan,” which is a package of transmission projects that included some but not all of the AC components in the AC Plan plus a new high voltage direct current (“HVDC”) underwater transmission line between the Seabrook Substation in New Hampshire, and the Mystic Substation in Everett (Exh. EV-1, at 2-13).<sup>10</sup> ISO-NE’s assessment of the AC and HVDC plans included both cost and non-cost criteria (id. at 2-15 to 2-18).

With regard to the cost of the two plans, Eversource stated that the total cost of the AC Plan would be significantly lower than the cost of the HVDC Plan (Exh. EV-1, at 2-15). Eversource stated that, based on each proponent’s estimates, the total cost of the AC and HVDC plans was \$739.7 million and \$1,025.4 million, respectively – a cost differential of \$285.7 million (Exh. NG-1, at 2-15).<sup>11</sup> New Hampshire Transmission LLC (“NHT”), the proponent of the HVDC Plan, put forward a price cap proposal that would limit cost recovery for certain components of the HVDC plan, in order to protect ratepayers from unanticipated cost overruns (Exh. EV-1, at 2-15).<sup>12</sup> According to Eversource, ISO-NE concluded that even with the price cap proposed by NHT, there was no scenario in which it would expect the HVDC Plan to be cost-competitive with the AC Plan (id.).

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<sup>10</sup> The HVDC Plan would obviate the need for the Project, as well as other AC Plan components currently before the Siting Board, including a new transmission line between the Woburn Substation and Wakefield Junction (EFSB 15-04/D.P.U. 15-140/15-141) (Exh. EV-3, app. 2-3, at 71-74).

<sup>11</sup> The transmission owners’ cost estimates were provided in 2017 dollars, with a stated accuracy of -25 percent to +50 percent (Exh. EV-1, at 2-15). ISO-NE engaged Electrical Consultants, Inc. to independently review these cost estimates (Exh. EV-1, at 2-3). Electrical Consultants, Inc. estimated a cost differential between the two plans of \$245.2 million in favor of the AC Plan (id. at 2-15).

<sup>12</sup> NHT is the owner of the Seabrook switchyard and proposed to build the HVDC transmission line between Seabrook and the Mystic Substation in the HVDC Plan (Exh. EV-1, at 2-2 to 2-3).



Eversource stated that, typically, ISO-NE would conclude its comparison of the AC and HVDC Plans based on this cost differential alone (Exh. EV-3, app. 2-2, at 32; Tr. 1, at 59). However, at the request of various stakeholders, including state officials in Massachusetts and New Hampshire, ISO-NE further evaluated the merits of each plan, considering a number of non-cost criteria such as constructability, construction outages, and expected in-service date (Exhs. EV-1, at 2-16 to 2-18; EV-3, app. 2-2, at 32; Tr. 1, at 59-60). ISO-NE determined that, for ten of the non-cost criteria, the AC Plan would be superior or comparable to the HVDC Plan, and that for one criterion only (reliability following extreme contingencies), the HVDC Plan would be superior (Exh. NEP-1, at 2-18 to 2-19).<sup>13</sup> Table 1, below, provides ISO-NE's summary of its assessment of both cost and non-cost criteria for the AC and HVDC Plans. Based on this assessment, ISO-NE selected the AC Plan as its preferred solution for the Greater Boston Area (Exhs. EV-1, at 2-19; EV-3, app. 2-3, at 12; Tr. 1, at 59-62).

**Table 1. Comparison Matrix of the AC and HVDC Plans as Presented by ISO-NE**

	AC Plan	HVDC Plan
Cost	✓	✗
Constructability	✓	✓
Construction outage / cost impacts	✓	✗
Expected in-service dates	✓	✓
Interface impacts	✓	✗
Losses	✓	✗
Extreme contingency analysis results	✗	✓
Expansion capabilities	✓	✗
Lifetime maintenance requirements	✓	✗
Incremental costs for potential retirements	✓	✗
Siting Issues	✓	✓
Storm Hardening	✓	✓
✓ Is applied to the plan which better achieves the objective		
✗ Is applied to the plan which does not achieve the objective as well as the other plan		

Source: Exh. EV-3, app. 2-3, at 13-14.

<sup>13</sup> Extreme contingencies would include events such the loss of all of the transmission lines in a common right-of-way, or the loss of a substation (Exh. EV-1, at 2-17). Eversource stated that while ISO-NE assessed alternative solutions for extreme contingencies to provide a fuller understanding of system impacts, mitigation is not required by NERC, NPCC, or ISO-NE for overloads modeled as resulting from extreme contingencies (id. at 2-19).

According to the Company, the AC Plan included a total of approximately 40 individual transmission projects that together would bring the transmission system in the Greater Boston Area into compliance with applicable national and regional reliability standards (Exh. EV-1, at 1-9). Specifically, Eversource stated that the AC Plan included construction of the Project (as described in Section 1.A, above) to increase the summer LTE rating of the Existing Line by at least 330 megavolt-amperes (“MVA”) and address the post-contingency overloads identified on the Existing Line (*id.*; Exh. EFSB-N-15; Tr. 1, at 115).<sup>14</sup>

C. Position of the Parties

ISO-NE indicated its support of the need for the Project as presented by the Company (Tr. 1, at 62). No other parties provided comments on the identified need.

D. Analysis and Findings on Need

In the 2015 Needs Assessment, ISO-NE’s Working Group identified numerous reliability needs within the Greater Boston Area, including deficiencies in Sub-Area B and on the Existing Line. The Project is one element of the recommended set of solutions to address these reliability needs. The Working Group’s assessment of Sub-Area B demonstrated that the existing transmission system would be insufficient to reliably supply customers in the Greater Boston Area under both pre-existing and forecast summer peak load conditions following certain N-1-1 contingencies. Furthermore, the Company presented evidence that if proposed transmission system reinforcements elsewhere in the Greater Boston Area were constructed with the exception of the Project, the regional transmission system would still be vulnerable to thermal overloads. Eversource must eliminate the potential for these thermal overloads in order to comply with applicable national and regional reliability standards and provide a reliable supply of electricity to customers in the Greater Boston Area.

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<sup>14</sup> The Company stated that an increase in the summer LTE rating of the Existing Line of at least 330 MVA by 2023 would be required assuming all other components of the AC Plan were implemented (Exh. EFSB-N-15; Tr. 1, at 115). If other components of the AC Plan were not completed, a summer LTE rating of at least 343 MVA by 2023 would be required (Exh. EFSB-N-15).

The Company's assessment of need relied on the summer peak 90/10 load forecast from the 2013 CELT Report, adjusted to reflect the contributions of forecast DR and EE resources. The Company has provided enough information to permit a general understanding of its forecasting method, and the Siting Board finds that the Company's forecast is reviewable, appropriate and reliable for use in this proceeding to evaluate the Company's assertion of need.

Eversource also relied on the 34 Design Cases and 3 Retirement Sensitivity Cases developed by the Working Group for the Greater Boston Area, and the application of planning standards and criteria prescribed by NERC, NPCC, and ISO-NE to support its assertion of need. The Siting Board finds that the Company's use of an N-1-1 planning criterion is reasonable and appropriate, and that Eversource's existing transmission system does not currently meet this criterion under certain system conditions. For these reasons, the Siting Board finds that additional energy resources are needed to maintain a reliable supply of electricity to Sub-Area B within the Greater Boston Area.

#### IV. ALTERNATIVE APPROACHES TO MEETING THE IDENTIFIED NEED

##### A. Standard of Review

G.L. c. 164, § 69J requires a project proponent to present alternatives to the proposed facility, which may include: (1) other methods of transmitting or storing energy; (2) other sources of electrical power; or (3) a reduction of requirements through load management.<sup>15</sup> In implementing its statutory mandate, the Siting Board requires a petitioner to show that, on balance, its proposed project is superior to such alternative approaches in terms of cost, environmental impact, and ability to meet the identified need. 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. Salem Cables at 17-18; IRP at 25-26; NSTAR Electric Company, 19 DOMSB 1, EFSB 10-2/D.P.U. 10-131/10-132, at 29 (2012) ("Lower SEMA").

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<sup>15</sup> G.L. c. 164, § 69J also requires an applicant to present "other site locations." This requirement is discussed in Section V.A, below.

## B. Identification of Alternative Approaches for Analysis

In assessing alternative solutions to meet the identified need, Eversource explored non-transmission alternatives (“NTAs”) including generation, EE, DR, and energy storage, as well as alternative transmission and substation facilities.<sup>16</sup>

### 1. Non-Transmission Alternatives

Eversource engaged LEI to conduct an assessment of the cost and feasibility of using NTAs to address the identified need (Exh. EV-1, at 4-7). Eversource stated that it provided LEI with information on the most helpful locations for NTA resources, as well as the amount of NTA resources required to mitigate the potential for post-contingency thermal overloads on the Existing Line in the event that construction of the Project was deferred (*id.* at 4-8).<sup>17</sup> NTA resources were modeled at three different maximum sizes (“ $P_{\max}$ ”) per injection point, a  $P_{\max}$  of 15 MW, 250 MW, and 750 MW, in order to model different categories of resource types (*id.*). Table 2 below provides a summary of the amount of NTA resources and the number of injection points the Company identified as required under each of the  $P_{\max}$  cases.<sup>18</sup>

**Table 2. Summary of the Total Amount of NTA Resources and Number of Injection Points Required to Address the Identified Need as Presented by the Company**

$P_{\max}$ Level	<u>15 MW</u>	<u>250 MW</u>	<u>750 MW</u>
<b>Total NTA Resource Needed (MW)</b>	606	445.3	440.1
<b>Total Number of Injection Points</b>	43	8	8

Sources: Exhs. EV-1, at 4-9; EFSB-PA-11(S1).

<sup>16</sup> Eversource also explored a no-build approach. However, this approach did not address the identified reliability need (Exh. EV-1, at 4-2).

<sup>17</sup> LEI’s assessment assumed all other elements of the ISO-NE recommended solution for the Greater Boston Area were completed (Tr. 1, at 63).

<sup>18</sup> An injection point is the location on the electrical grid where a new generating facility connects.

According to the Company, LEI identified a broad range of potential NTA technologies for consideration, including combined-cycle gas turbines, dual-fuel jet engines, utility-scale solar with storage, and EE and DR (Exh. EV-1, at 4-9). Eversource stated that LEI first considered the minimum and maximum size of each NTA technology to determine whether a particular NTA option could provide the size of injection needed at a specific location (id.). Next, LEI considered whether a specific NTA technology has the operating characteristics necessary to respond to contingency conditions (id.).<sup>19</sup> Finally, LEI considered whether sufficient peak load exists at each location to make load reductions from EE a feasible solution (id. at 4-10; EFSB-PA-38). The Company stated that LEI established a maximum peak demand reduction of 15 percent over and above EE reductions already embedded in the ISO-NE demand forecast for this purpose (Exhs. EV-1, at 4-10; EV-3, app. 4-1 (Revised)(Clean) at 20).<sup>20</sup>

After identifying the technically feasible NTA technologies for each case and location, LEI developed a least-cost set of NTA solutions based on the gross and net levelized cost of entry (“LCOE”) for each technology (Exh. EV-1, at 4-10).<sup>21</sup> The Company stated that because future market revenues are uncertain, LEI calculated the net LCOE under four scenarios with varying assumptions for revenues from the capacity market and solar renewable energy certificates (id. at 4-11). Based on this assessment, LEI concluded that the direct cost to

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<sup>19</sup> The Company stated that order to respond to an N-1-1 contingency, an NTA resource must be able to provide energy within 30 minutes of the first contingency (Exh. EV-1, at 4-9 to 4-10). Eversource stated that an NTA resource must then be able to continue to operate for a minimum of twelve hours, which would provide sufficient time for the failed transmission system element to be repaired, or for load levels to drop sufficiently, and corresponds to the amount of time for which a transmission line can be operated to its LTE rating (id. at 4-10; Exh. EFSB-PA-12).

<sup>20</sup> The Company stated that achieving peak load reductions from EE of 15 percent over and above levels achieved through state-mandated programs is an aggressive goal, which goes well beyond utility geo-targeting experiences to date (Exh. EV-3, app. 4-1 (Revised)(Clean) at 20).

<sup>21</sup> The Company stated that the gross LCOE is a dollars-per-kilowatt-year (\$/kW-year) value that includes all investment and operating costs, and that net LCOE is derived by deducting any potential revenue streams (e.g., energy sales, capacity market revenues, etc.) from the gross LCOE (Exh. EV-1, at 4-10).

ratepayers for an NTA solution would range from \$25.9 million annually (for a solution consisting of 406.8 MW of new combined-cycle generation and 357.3 MW of utility-scale solar/storage) to \$146.7 million annually (for a solution consisting of 713.4 MW of aeroderivative peaking generation) (Exh. EV-3, app. 4-1 (Revised)(Clean) at 44-46). LEI stated that the most likely NTA scenario would have a direct cost to ratepayers of \$32.6 million per year, and would consist primarily of large-scale combined-cycle gas-fired generation (id. at 12-13). Accordingly, the Company argued that an NTA solution would be more than triple the cost to ratepayers compared to the annual cost to ratepayers of the Project, which it estimated at approximately \$10 million (id. at 13; Exh. EFSB-PA-26). The Company also noted significant barriers to the implementation of NTA solutions of this scale (Exh. EV-1, at 4-13). As an example, the Company stated that, under a primarily solar photovoltaic scenario, nearly 32 square miles of flat, unencumbered land would be required, which it asserted was an impractical real-estate scenario in New England (id.; Exh. EFSB-PA-39; Tr. 1, at 101).<sup>22</sup> Eversource stated that for these reasons an NTA was not the preferred solution for addressing the identified need (Exh. EV-1, at 4-13)

## 2. Transmission and Substation Alternatives

The Company considered two basic types of transmission solutions: (1) options to increase the capacity of transmission directly connecting the Woburn and Mystic Substations, beyond that provided by the Existing Line, in order to prevent thermal overloads on that line (a “Type 1 Solution”); and (2) adding new transmission facilities elsewhere on the transmission system to address the N-1-1 contingencies of concern (a “Type 2 Solution”) (Exh. EV-1, at 4-2).<sup>23</sup> The Company asserted that to be effective, a Type 2 Solution would require one element of each N-1-1 contingency pair be duplicated (id. at 4-3). Due to the large number of

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<sup>22</sup> In comparison, the entire land area of Woburn, Medford, and Arlington, combined, is approximately 32 square miles (Exh. EFSB-PA-39).

<sup>23</sup> Eversource stated that because there are no existing overhead transmission line ROW available between the Woburn and Mystic Substations, each of the Type 1 Solutions considered would require the construction of underground transmission line facilities (Exh. EV-1, at 4-3).

N-1-1 contingencies of concern, the Company determined that a Type 2 Solution would include a large number of separate transmission projects, and would have a much higher cost and greater environmental impacts than a Type 1 Solution (id.; Tr. 1, at 115). Accordingly, the Company did not consider a Type 2 Solution further (Exh. EV-1, at 4-3).

Next, the Company considered Type 1 Solution options that would increase the capacity of the Existing Line through the installation of supplemental cooling facilities and/or replacement of the existing conductor with a larger capacity cable (“Option A-1” and “Option A-2,” respectively) (Exh. EV-1, at 4-3). The Company stated that neither of these options, either alone or in combination, would provide a sufficient increase in the LTE rating of the Existing Line (id. at 4-3 to 4-4; Exh. EFSB-PA-2).<sup>24</sup> Finally, the Company considered two new underground transmission line options – “Option A-3” (the Project), where a new high pressure fluid-filled pipe-type cable (“HPFF-PTC”) would be installed in parallel with the Existing Line, and “Option A-4,” where the Existing Line would be retired and replaced with a larger capacity cross-linked polyethylene-insulated (“XLPE”) line (Exh. EV-1, at 4-3). These two underground transmission options are discussed in greater detail below.

a. Option A-3 (The Project)

As described in Section I.A. above, the Project would involve construction of a new underground transmission line between the Company’s Woburn and Mystic Substations (Exh. EV-1, at 1-6). The New Line would operate in parallel with, and increase the capacity of, the Existing Line and would require installation a new air-core series reactor at the Woburn Substation to balance power flows between the Existing Line and the New Line (id. at 1-6, 1-11).

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<sup>24</sup> In response to questions from staff, the Company also considered a hybrid option involving the implementation of Options A-1, A-2, and NTA resources such that a sufficient increase to the Existing Line LTE rating would be achieved (Exh. EFSB-PA-3 (S1)). The Company stated that nearly 350 MW of NTA resources would be required at the Mystic and Woburn Substation under such a scenario, which it did not believe would be feasible given existing development in these areas (Exh. EFSB-PA-3(S1); Tr. 1, at 119-121). Additionally, the Company identified reliability concerns in association with a hybrid solution, and determined that such a solution would be more costly than the Project (Exh. EFSB-PA-3(S1); Tr. 1, at 121-123).

Modifications to the connection arrangement of the existing transmission lines in the Mystic Substation to accommodate the New Line would also be required (id. at 1-11). The Company stated that an HPFF-PTC system would be appropriate for the Project because it would provide a sufficient increase to the LTE rating of the Existing Line at a significantly lower cost than an XLPE type system (id. at 4-5).<sup>25</sup> Eversource stated that an HPFF-PTC system is the technology used in the Existing Line, and consists of three stranded copper, insulated cables installed in a sealed steel pipe filled with dielectric fluid (id. at 4-4). The Company stated that the New Line would simply tie into the existing Woburn and Mystic Substation facilities, with no changes to the existing fluid pressurizing plant or heat exchanger required (Exh. EFSB-PA-5).

b. Option A-4

Rather than build a second underground transmission line in parallel with the Existing Line, the Company also considered replacing the Existing Line with a new higher-capacity underground transmission cable (Exh. EV-1, at 4-4 to 4-5). Under Option A-4, the Company would construct a new underground transmission line between the Woburn and Mystic Substations and then remove the Existing Line once this new line was complete (Exh. EV-1, at 4-5; Tr. 1, at 116). Similar connection work to that proposed for the Project would be required at the Woburn and Mystic Substations to tie in the new line, but installation of a new series reactor would not be necessary (Exhs. EV-1, at 4-5; EFSB-PA-8; Tr. 1, at 117-118). In order to achieve a sufficient LTE rating, Option A-4 would require the use of XLPE cables, which have a higher power transfer capability than an equivalently sized HPFF-PTC system (Exh. EV-1, at 4-5).<sup>26</sup> XLPE cables do not require the use of pressurized pipes filled with dielectric fluid, but XLPE-insulated cables are larger in diameter and heavier than each cable of an HPFF-PCT system (and so are delivered in shorter lengths), thus requiring a larger width of excavation to install the line and a greater number of manholes for cable splicing (id. at 4-4; Exh. EFSB-PA-8).

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<sup>25</sup> According to the Company, the Project would provide a post-Project summer LTE rating of 378 MVA (Exh. EFSB-PA-2).

<sup>26</sup> The Company stated that with the use of an XLPE cable system, Option A-4 would provide a post-Project summer LTE rating of 342 MVA (Exh. EFSB-PA-2).



c. Company's Comparison of the Project and Option A-4

Eversource compared the Project and Option A-4 on the basis of electrical performance, reliability, cost, and environmental impacts. From an electrical performance and reliability perspective, the Company stated that both HPFF-PTC and XLPE cable systems have demonstrated reliable performance over many years (Exh. EV-1, at 4-6). Furthermore, the Company stated that both the Project and Option A-4 would provide a sufficient capacity increase to address the identified reliability need (*id.* at 4-5). However, the Company stated that the Project would provide a larger increase in capacity, and would therefore provide greater flexibility for accommodating future growth in electrical demand (Exhs. EFSB-PA-2; EFSB-PA-30; Tr. 1, at 118-119). Thus, the Company concluded that the Project is preferable with respect to reliability (Exh. EFSB-PA-30; Tr. 1, at 118-119).

From a cost perspective, the Company stated that the Project would cost approximately \$35 million less than Option A-4, and therefore is preferable (Exh. EV-1, at 4-6; Tr. 1, at 117-118). The Company identified several factors driving this difference in cost, including the need for a greater number of manholes, and a larger amount of excavation under Option A-4 compared to the Project (Exh. EFSB-PA-8).

Additionally, the Company stated that there is an existing spare pipe crossing the Mystic River near the Mystic Substation that would be suitable for an HPFF-PTC system, but would not be large enough to accommodate XLPE cables (Exh. EV-1, at 4-5). According to the Company, horizontal directional drilling ("HDD") would be required to construct a new river crossing at this location under Option A-4, but would not be necessary for the Project (Tr. 2, at 168). The costs associated with constructing this new crossing are a significant contributor to the increased cost of Option A-4 alternative compared to the Project (Exh. EV-1, at 4-7). Finally, from an environmental impact perspective, the Company stated that while the environmental impacts associated with the Project and Option A-4 would be similar for the majority of the construction activities required, additional impacts associated with the greater number of manholes and the

new HDD crossing of the Mystic River would be avoided under the Project, making the Project preferred with respect to environmental impacts (id. at 4-5; Tr. 2, at 164-165).<sup>27</sup>

C. Analysis and Findings on Alternative Approaches

The evidence described above shows that each NTA would be significantly more costly than the Project, alone or in combination with transmission system investments, and given the scale of the required resource additions, would likely encounter significant implementation obstacles.<sup>28</sup> Regarding transmission and substation alternatives, the Company showed that a Type 2 Solution would likely result in greater environmental impacts and have a higher cost compared to the Project, and that Type 1 Solutions involving enhancements to the Existing Line would not provide an increase in capacity sufficient to meet the identified need. Finally, the Company showed that replacing the Existing Line with a higher-capacity XLPE underground transmission line would provide a lesser increase in capacity, at a higher cost and greater environmental impact than the Project.

Therefore, the Siting Board finds that the Project is superior to the other alternatives identified with respect to providing a reliable energy supply for the Commonwealth with minimum impact on the environment at the lowest possible cost.

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<sup>27</sup> In response to questions from staff, the Company also discussed the potential for environmental impacts due to an accidental release of dielectric fluid from the HPFF-PTC system proposed for the Project (Tr. 2, at 165-167). According to the Company, significant improvements in leak detection and prevention (including corrosion control and real-time monitoring) have been made in association with newer HPFF-PTC systems, and would be implemented as part of the Project (id. at 167; Exh. EFSB-PA-10). The Company stated that it was confident that with the implementation of these new construction and monitoring measures the risk of a dielectric fluid leak was very low, and that the Project is preferable from an environmental impacts perspective (Tr. 2, at 166-167).

<sup>28</sup> The Siting Board continues to expect that Eversource will strongly encourage its customers, both existing and new, to take full advantage of EE programs. Eversource should also continue to explore creative ways to use NTAs (individually or in combination) to avoid or delay the need for new transmission infrastructure.

## V. ROUTE SELECTION

### A. Standard of Review

G.L. c. 164, § 69J requires a petition to construct to include a description of alternatives to the facility, including “other site locations.” Thus, the Siting Board requires an applicant to demonstrate that it has considered a reasonable range of practical siting alternatives and that its proposed facilities are sited in locations that minimize cost and environmental impacts. To do so, an applicant must meet a two-pronged test. First, the applicant must 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. Second, the applicant generally must establish that it identified at least two noticed sites or routes with some measure of geographic diversity. Salem Cables at 34-35; IRP at 41-42; Boston Edison Company d/b/a NSTAR Electric, 14 DOMSB 233, EFSB 04-1/D.T.E. 04-5/D.T.E. 04-7 (2005) (“NSTAR/Stoughton”) at 32-33. But see Colonial Gas Company d/b/a National Grid, EFSB 16-01, at 28 (2016), where the Siting Board found the Company’s decision not to notice an alternative route to be reasonable.

### B. The Company’s Route Selection Process

Eversource characterized route selection as an iterative process (Exh. EV-1, at 1-11). The Company initiated its route selection process by defining a study area designed to encompass the existing linear corridors and ROWs that provide the most direct and shortest routes between the Woburn and Mystic Substations (id. at 5-3; Tr. 2, at 175). The Company then developed initial route corridor screening guidelines to identify and select complete candidate route corridors for further analysis (Exh. EV-1, at 5-2 to 5-3).<sup>29</sup> The route corridor screening guidelines included: (1) maximizing the use of existing linear corridors and ROW and minimizing the use of private property; (2) using the most direct routes; (3) minimizing routing on narrow streets; and (4) minimizing cost (id. at 5-3). Eversource identified four potential route corridors for constructing the Project (id. at 5-11 to 5-12). Within these potential route corridors,

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<sup>29</sup> The Company is using the term “route corridor” to denote a general pathway that may encompass multiple potential route options (Exh. EV-1, at 5-3).

the Company then identified several potential route segments for further evaluation through a process that included field reconnaissance and meetings with municipal representatives (id.).<sup>30</sup> Finally, the Company established scoring criteria and weighting system, and then scored the candidate routes (id. at 5-2). The Company's process is described in more detail below.

The study area for the Project encompassed a geographic area of approximately 20 square miles within the municipalities of Woburn, Winchester, Somerville, Cambridge, Medford, Arlington, Belmont, Everett, and in the Charlestown section of Boston (id.). As potential initial route corridors (where each may include multiple alternative routing options), the Company identified the following existing corridors within the study area: existing transmission corridors,<sup>31</sup> an MBTA commuter railroad corridor; and a river corridor which the Company identified as the Lower Mystic River Submarine Line Option (id. at 5-4 to 5-6). The Company eliminated the Lower Mystic River Submarine Line Option from further consideration due to constructability, cost, and permitting constraints (Exh. EFSB-RS-8).

Eversource also conducted a high-level screening analysis of an overhead transmission line corridor routing option, and determined that there are no existing overhead transmission line corridors within the study area (Exh. EV-1, at 5-2). The Company stated that constructing a new above-ground transmission line along city streets would be highly impractical because of the extensive property acquisition and demolition that would be required to accommodate safe clearance and suitable ROW widths, and thus eliminated the overhead option from further consideration (id.).

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<sup>30</sup> Eversource noted that its initial meetings with representatives from the municipalities along the route sought their input on matters such as road segment conditions, traffic considerations, and future plans for municipal road improvement and utility projects (Exh. EV-1, at 5-12).

<sup>31</sup> The Company identified three existing transmission facilities in the Study area: (1) the existing Eversource Lower Mystic River underwater crossing spare conduit adjacent to Route 99/Alford Street Bridge in Charlestown; (2) the Existing Line through Woburn, Winchester, Medford, Somerville, Charlestown (Boston) and Everett; and (3) the existing 346/365 and 351/358 345 kV Lines through Woburn, Winchester, Medford, Arlington, Cambridge, Somerville, Charlestown (Boston) and Everett (Exh. EV-1, at 5-4).

Eversource then identified the following four distinct potential route corridors within the Project study area: (1) Route Corridor 1, a route corridor that parallels the Existing Line and travels 7.2 miles in streets through Woburn, Winchester, Medford, Somerville, Boston, and Everett (id. at 5-6, 5-7); (2) Route Corridor 2, which Eversource identified as an 8.1-mile corridor that passes through Woburn, Winchester, Medford, Somerville, Boston, and Everett, of which 3.6 miles follow an existing railroad corridor (id. at 5-7 to 5-9); (3) Route Corridor 3, an approximately 8.9-mile route corridor that parallels the existing underground 345 kV 351/385 Lines (in Somerville and Cambridge to the North Cambridge Substation) and the existing 345 kV 365/346 Lines from North Cambridge Substation to Woburn Substation (through the towns of Cambridge, Arlington, and Winchester) (id. at 5-9 to 5-10); and (4) Route Corridor 4, generally located on the east side of the Mystic River, traversing 8.9 miles in Woburn, Winchester, Medford, and Everett (id. at 5-11).

The Company eliminated Route Corridor 2 from further consideration because it included a narrow width of an MBTA railroad corridor which the Company stated poses design, construction, safety, and reliability constraints (Exh. EFSB-RS-12).<sup>32</sup> The Company also eliminated Route Corridor 3 from further consideration because it is the longest route, has an anticipated higher number of design and construction constraints (e.g., high utility density, more intersections, and more traffic congestion), and higher estimated construction costs (id.). According to the Company, Route Corridor 4 passes through Medford Center, and follows roadways that are mostly on busy commuter routes (Exh. EV-1, at 5-11). Eversource then further evaluated the remaining two route corridors, Route Corridor 1 and Route Corridor 4, using field reconnaissance and input from municipalities along the route corridors, to identify a total of six candidate routes (Routes 1, 1A, 1B, 4, 4A, and 4B) (id. at 5-11 to 5-16). The

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<sup>32</sup> Eversource stated that the existing MBTA ROW ranges in width from 50-60 feet and contains two active commuter rail tracks, railroad ballast, many locations of rock ledge, numerous at-grade road crossings and associated train signaling equipment, and drainage ditches at both edges of the ROW (Exh. EFSB-RS-12). The Company also indicated that there is no available MBTA or other adjacent property for an additional permanent easement for locating the pipe-type cable further from active railroad tracks or for temporary construction access (id.).

Company then further evaluated and scored these six routes using siting factors including built and natural resource factors, design/construction factors, cost, and reliability, to identify the Project's Primary Route and Noticed Alternative Route (id. at 5-12).

Eversource evaluated its six candidate routes according to the following six built environment or community factors: (1) residential land uses; (2) commercial or industrial land uses; (3) sensitive receptors; (4) public transportation facilities; (5) historic and archeological resources; and (6) potential for traffic congestion (Exh. EV-1, at 5-16). The Company's selected natural resource factors included: (1) Article 97 lands; (2) public shade trees; (3) river crossings; (4) wetland resource crossings; (5) protected habitat crossings; (6) Outstanding Resource Waters ("ORWs") and Areas of Critical Environmental Concern ("ACECs"); and (7) potential for subsurface contamination (id.). The Company also reviewed the candidate routes with respect to five design/construction factors: (1) length; (2) road width; (3) utility density; (4) hard angles; and (5) highway and railroad crossings (id. at 5-17). Using the 18 factors described above, Eversource developed a route scoring and weighting system to perform unweighted and weighted ranking of the candidate routes (id. at 5-2, 5-30).

The Company scored each route by developing ratio scores for each of the 18 route selection factors. For each factor, potential impacts were quantified for each route; then a ratio score was calculated as the ratio of the impact of the particular route to the impact of the route with the highest potential impact, so that the route with the highest potential impact would have a ratio score of "1", while all other routes would have ratio scores between "0" and "1" (id. at 5-16).<sup>33</sup> The ratio scores for each built environment, natural resource, and design/construction factor were then added together to get a total raw ratio score for each route (id.).

To adjust the route scoring results for the perceived relative importance of individual factors, the Company assigned weights to each factor (Exh. EV-1, at 5-24). A single weight of

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<sup>33</sup> For example, if a hypothetical Route X has the highest potential impact for residential land use at ten residential units along the route, and Route Y has five residential units along its route, then the Route X has a ratio value of 10 units/10 units or "1", and the ratio score for Route Y would be 5 units/10 units or "0.5" (Exh. EV-1, at 5-16).

“1” represented the lowest importance and a triple weight of “3” represented the highest importance (id. at 5-25). The Company assigned a triple weight to four factors: residential land uses, commercial/industrial land uses, potential for traffic congestion, and Article 97 lands (id. at 5-25, 5-26). The Company assigned a double weight of “2” to five factors: sensitive land uses, waterbody crossings, ORWs and ACECs, existing road width, and existing utility density (id. 5-25, 5-26). For the remaining nine factors, Eversource assigned a single weight (id.; Exh. EFSB-RS-11). Raw ratio scores for each factor were then multiplied by the assigned weight for each factor to provide weighted scores, which were then added to yield a total weighted score for each candidate route (Exh. EV-1, at 5-25). The total weighted scores for each candidate route, as well as projected cost are shown in Table 3 below (id.).

**Table 3. Weighted Scores and Estimated Cost of Candidate Routes**

Route	Route Length (miles)	Built and Natural Resource and Design/Construction		Estimated Cost	
		Weighted Ratio Score	Rank	(Millions)	Rank
1	7.2	26.93	1	\$64.8	1
1A	7.4	26.95	2	\$66.8	3
1B	7.3	27.75	4	\$66.3	2
4	9.0	28.63	5	\$81.0	4
4A	9.3	29.23	6	\$84.3	6
4B	9.2	27.08	3	\$83.0	5

Sources: Exh. EV-1, at 5-28 to 5-29; RR-EFSB-8(1).

Comparing the routes on reliability, the Company stated that, while increased electric cable lengths can, in general, introduce additional exposure to potential faults, the candidate routes for this Project have relatively small differences in length and therefore would not result in a substantial difference in their level of exposure to faults (Exh. EV-1, at 5-29). The Company concluded that underground cables along any of the routes under consideration would meet the identified need in a reliable manner, and therefore did not consider reliability as a determining factor in its route selection process (id.). As a result, the Company based its route selection on relative environmental impacts, constructability factors, and estimated cost (id. at 5-29 to 5-30).

C. Selection of the Primary and Noticed Alternative Routes

Eversource selected Route 1 as its Primary Route because it had the best scores for each of built environment, natural resource environment, and design/construction feasibility evaluation criteria, and the lowest estimated total cost (Exh. EV-1, at 5-30). For the selection of a Noticed Alternative Route, the Company considered: (1) geographic diversity of candidate routes, and (2) built environment, natural resource environment, and design/construction scores, and cost (id.). While Route 1A had the second best built and natural resource environment, and design/construction scores after the Primary Route, the Company noted that both Route 1A and Route 1B largely overlap with the Primary Route and thus provide inadequate geographic diversity (id.). Conversely, Eversource indicated that routes 4, 4A, and 4B all provide geographic diversity compared to the Primary Route, because they traverse different streets for at least two thirds of their lengths, and because of their general location east of the Mystic River (id.). Although it is not the least costly among the corridor 4 alternatives, the Company selected Route 4B as the Noticed Alternative Route because it had a better built environment, natural resource environment, and design/construction scores (id.). Route 4B is also the most buildable alternative to the Primary Route, providing a route segment alternative that reflected input from the Town of Winchester officials regarding potential traffic congestion concerns in the Winchester Center area (id.).

D. Analysis and Findings on Route Selection

The Siting Board requires that applicants consider a reasonable range of practical siting alternatives and that proposed facilities are sited in locations that minimize cost and environmental impacts. In past decisions, the Siting Board has found various criteria to be appropriate for identifying and evaluating route options for transmission lines and related facilities. These criteria include natural resource impacts, land use impacts, community impacts, cost and reliability. Salem Cables at 38-39; IRP at 41-42; NSTAR/Stoughton at 43-44. The Siting Board has also found the specific design of scoring and weighting methods for chosen criteria to be an important part of an appropriate site selection process. Salem Cables at 38-39; IRP at 45; Boston Edison Company, 19 DOMSC 1, EFSC 89-12A, at 34-38 (1989).



Given the opportunity for using existing ROWs and corridors, and limitations imposed by the need for an interconnection between the Mystic and Woburn Substations, the Company appropriately identified a study area that would encompass reasonable siting options. Within the study area, using several initial screening criteria, the Company identified four initial route corridors and advanced two for further evaluation. Within these two corridors, the Company identified a total of six candidate routes. These criteria generally encompass the types of criteria that the Siting Board previously has found to be acceptable.

The Company then developed a quantitative system for ranking the six candidate routes and selecting the best route, which it identified as the Primary Route, based on a compilation of weighted scores across environmental and constructability criteria, as well as reliability factors and cost. This is a type of evaluation approach the Siting Board previously has found to be acceptable for transmission projects. Salem Cables at 38-39; IRP at 45; NSTAR/Stoughton at 43-45.

In addition, Eversource identified a Noticed Alternative Route such that the proposed Primary and Noticed Alternative Routes are mostly located on the west and east sides of the Mystic River, respectively, traversing different streets for most part of the route and resulting in varying degrees of environmental impact. The Siting Board concludes from this information that the Primary Route and the Noticed Alternative Route encompass a measure of geographic diversity.

Based on the route selection process described above, the Siting Board finds that the Company has: (1) 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 are clearly superior to the proposed project; and (2) identified a range of practical transmission line routes with some measure of geographic diversity. Therefore, the Siting Board finds that the Company has demonstrated that it examined a reasonable range of practical siting alternatives while seeking to minimize cost and environmental impacts.

## VI. ANALYSIS OF PRIMARY AND NOTICED ALTERNATIVE ROUTES

In this section, the Siting Board analyzes the Primary Route and the Noticed Alternative, based on environmental impacts, cost, and reliability. Based on the evidence and findings

presented below, the Siting Board concludes that the Primary Route is superior to the Noticed Alternative Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

A. Standard of Review

In implementing its statutory mandate under G.L. c. 164, §§ 69H, 69J, 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 environmental impact, cost, and reliability of supply. Salem Cables at 39; IRP at 46-47; NSTAR/Stoughton at 32-33.

The Siting Board first determines whether 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 examines the environmental impacts of the proposed facilities along the Primary and Noticed Alternative Routes and determines: (1) whether environmental impacts would be minimized; and (2) whether an appropriate balance would be achieved among conflicting environmental impacts as well as among environmental impacts, cost, and reliability. Finally, the Siting Board compares the Primary Route and the Noticed Alternative Route to determine which is superior with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

B. Description of the Primary and Noticed Alternative Routes

1. Primary Route

As described above, the proposed Project would consist of a new 115 kV transmission line constructed underground (Exh. EV-1, at 1-11). The Primary Route for the Project is approximately 7.7 miles long and traverses Winchester, Medford, Somerville, and Charlestown (Boston), within the same streets as the Existing Line (id. at 1-11, 6-9). The Primary Route proceeds from the Woburn Substation at the Woburn/Winchester municipal boundary to the

intersection of Pond Street and Woodside Road in Winchester (id. at 6-9).<sup>34</sup> The route then continues south on Woodside Road, transitioning straight ahead on Wildwood Street to the intersection of Fletcher Street/Palmer Street (id.). Proceeding southwest on Fletcher Street, the Primary Route crosses Church Street to Bacon Street, crossing the MBTA commuter railroad at Wedgemere Station and the Aberjona River on a course approximately 425 feet between Fenwick Road and the Wedgemere Station (id.; Exh. EFSB-CM-27). The Primary Route then travels east on Fenwick Road back to Bacon Street and through a rotary onto Main Street (Route 38) heading southeast (Exhs. EV-1, at 6-9; EFSB-CM-27). The route then proceeds on Main Street in Winchester, which becomes Winthrop Street (Route 38) in Medford, through Winthrop Square at the intersection of Winthrop Street and High Street (Route 60); it then continues on Winthrop Street south about 1,000 feet, crossing the Mystic River, approximately 160 feet east of the Winthrop Street bridge, onto South Street (Exhs. EV-1, at 6-9; EFSB-CM-27). From South Street, the route travels approximately 1,700 feet east to Mystic Avenue (Route 38) (Exh. EV-1, at 6-9).

The Primary Route proceeds southeast on Mystic Avenue in Medford and into Somerville, then crosses under Mystic Avenue to the east side of the elevated portion of I-93 near the intersection of Grant Street in Somerville (id.). The Primary Route proceeds southeast on the northbound-traffic side of Mystic Avenue, which is on the east side of I-93; then, it transitions at an angle off Mystic Avenue through the parking lot for Home Depot for about 550 feet on private property adjacent to the Existing Line, crosses under Assembly Square Drive and the MBTA (Haverhill and North Shore commuter lines and the Orange Line), and then meets Arlington Avenue in Boston (id.). The Company's Primary Route then makes a final turn east, along and across multiple lanes of Alford Street and Rutherford Avenue to an existing Eversource manhole within Ryan Playground, from which the route crosses under the Mystic River in existing conduits to another manhole on the north side of the Mystic River,

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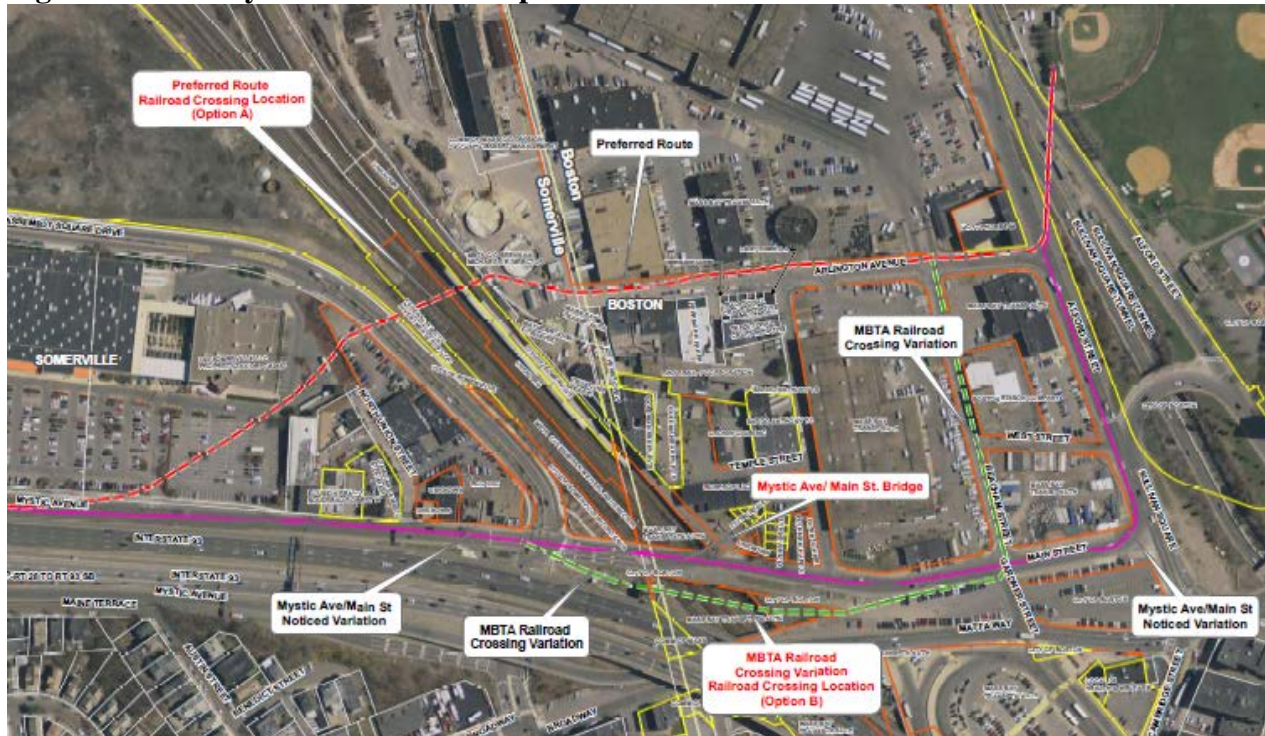
<sup>34</sup> According to the Company, between the Woburn Substation and Pond Street, the route would cross private property that serves primarily as a private parking lot for a residence at 192 Pond Street, Winchester (Tr. 4, at 505-509). The Company stated that Eversource has an existing 15-foot wide easement on the property and intends to locate the proposed new line within the existing 15-foot easement (id., at 505).

located inside the Mystic Generation Station property and then connects electrically within the Mystic Substation (id.).

As an early attempt to address the City of Somerville's concerns about the Primary Route, the Company evaluated a route variation near Assembly Row (Exh. EV-1, at 6-9). However, according to the Company, MassDOT rejected this Mystic Avenue/Main Street Variation citing planned bridge modifications, concerns over utility coordination for bridge maintenance and repair, and a preference to not have a pipe-type cable placed on or within its bridges (Tr. 2, at 218-219). Based on further discussion and consultation, MassDOT then suggested an alternative route for crossing the MBTA railroad at the Mystic Avenue/Main Street Bridge, which the Company identified as the MBTA Railroad Crossing Variation (the "Proposed Variation"), an approximately one-half mile route segment, described below (id. at 198; Exh. EFSB-G-8(S-1); RR-EFSB-12(1)).

## 2. Proposed Variation (MBTA Railroad Crossing Variation)

From the north, the Proposed Variation diverges from the Primary Route by remaining on Mystic Avenue on the east side of I-93 beyond the Home Depot parking lot (RR-EFSB-12, at 2). The Proposed Variation continues on Mystic Avenue to its intersection with Alfred Lombardi Way at the Somerville/Boston city line, crossing into a MassDOT ROW associated with I-93 (id.). From this point, the Proposed Variation traverses a narrow strip of property held by the City of Boston and then crosses under the MBTA railroad, using a trenchless design, on an alignment close to the Mystic Avenue/Main Street Bridge (id.). The Proposed Variation then travels east from the MBTA railroad, crossing another small property held by the City of Boston located off of Main Street and continues southeast of the Mystic Avenue/Main Street Bridge onto Main Street, and turns northeast on Beacham Street to Arlington Avenue (id.). Proceeding east approximately 250 feet, the Proposed Variation rejoins the Primary Route to the existing Eversource manhole in Ryan Playground (id. at 3). The Proposed Variation (a green dashed line) to the Primary Route (a red dashed line) is shown below in Figure 4.

**Figure 4. Primary Route and the Proposed Variation**

Source: RR-EFSB-12(S-1).

### 3. Noticed Alternative Route

The Company's Noticed Alternative Route is approximately 9.1 miles long and traverses Winchester, Medford, Everett, and a short distance within Boston city limits (Exh. EV-1, at 6-10). From the Woburn Substation, the route proceeds in the same manner as the Primary Route to the intersection of Wildwood Street and Palmer Street (*id.*). Turning northeast on Palmer Street and then Lake Street, the route crosses Main Street onto Skilling Road (part of Route 38 south) (*id.*). The Noticed Alternative Route then continues south on Washington Street and Main Street, passing through a rotary at Bacon Street/Grove Street and Everell Road, continuing on Route 38 before crossing the Winchester/Medford town line (*id.* at 6-10 to 6-11). In Medford, where Route 38 becomes Winthrop Street, the Noticed Alternative Route continues southeast to Lawrence Road and then turns south on Governors Avenue to its intersection with High Street (Route 60) in Medford Center (*id.* at 6-11). From this point, the Noticed Alternative Route proceeds east on High Street and Riverside Avenue, under the elevated I-93, to Commercial Street, which it follows south to Mystic Valley Parkway (Route 16) (*id.* at 6-10).

Proceeding east on Mystic Valley Parkway, the Noticed Alternative Route crosses the Fellsway (Route 28) onto Revere Beach Parkway (Route 16), crosses a bridge over the MBTA Orange Line/Haverhill Line near the Wellington MBTA Station, then crosses the Malden River Bridge at the Medford/Everett city boundary to Santilli Circle (Revere Beach Parkway at Gateway Center and Santilli Highway in Everett) (id. at 6-11). The Noticed Alternative Route proceeds east on Revere Beach Parkway to Sweetser Circle, where it turns south onto Broadway (Route 99), and crosses the North Shore MBTA railroad; it then continues southwest on Broadway in Charlestown (Alford Street in Boston) and into the Mystic Substation (id.).

#### 4. Substation Upgrades

A common feature of the Project, regardless of route, is that it would require upgrades at Eversource's Woburn and Mystic Substations (Exh. EV-1, at 6-11). The installation of the New Line would require a new series reactor at the Woburn Substation to balance power flows between the Existing and New Lines (id. at 6-10). At the Mystic Substation, the connection arrangement would be modified (swapped) between the Existing Line and the 488-518 Line (id. at 1-11, 6-11). The Company stated that these modifications would not require expansion of the fence lines at either of these substations (id. at 6-11).

#### 5. General Description of Project Construction

General construction methods for the in-street portion of the Project would be similar for both the Primary Route and the Noticed Alternative Route, and are briefly described below. Eversource indicated that sequencing of underground transmission line construction would include: (1) manhole installation; (2) trench excavation and pipe installation; (3) cable pulling, splicing, and testing; (4) pipe fluid filling; and (5) final pavement and restoration (Exh. EV-1, at 6-2; Tr. 2, at 306-307). Different methods for pipe installation would be used where railroad and rivers are crossed (Exh. EFSB-LU-3).

In addition to in-street construction, trenchless crossings (i.e., jack-and-bore, HDD) would be employed to cross railroads and rivers along the Primary Route and the Noticed Alternative Route (see Section VI.C.2). Substation work for the Project would involve

construction of foundations for the series reactor, and trenching of the line installations in the Woburn Substation (Exh. EV-1, at 6-2).

Temporary trench openings for in-street construction would typically range from 100 to 200 feet per day, depending on street conditions, such as utility density and congested traffic areas (id. at 6-4; Exh. EFSB-CM-6).<sup>35</sup> The Company stated that within each segment, depending on conditions encountered, the following trench construction tasks would occur over a period of ten to 18 construction days: (1) one day for survey and layout; (2) one day for pavement cutting; (3) two to five days for trench excavation and shoring; (4) one to three days for conduit installation; (5) three to five days for duct bank concrete placement and curing and shoring removal; and (6) two to three days for backfilling and temporary pavement placement (Exh. EFSB-CM-6; Tr. 2, at 320-322).

With respect to manholes, the Company would install 19 precast concrete manhole vaults on the Primary Route and the Proposed Variation that would be located entirely underground (Exh. EV-1, at 6-4 to 6-5; Tr. 4, at 506; RR-EFSB-12(S-1)). The manhole vaults would typically be eight feet wide by twenty-two feet long and six feet high and would be installed at intervals of approximately 2,000 to 2,400 linear feet (Exh. EV-1, at 6-2 to 6-4; Tr.4, at 505-506). Each manhole vault would typically take seven to ten days to install (Exh. EV-1, at 6-5; Tr. 2, at 325).

Eversource stated that high pressure fluid filled cable splicing activities are generally carried out on a continuous 24-hour schedule and typically require five days per splice joint (Exhs. EFSB-CM-4; EFSB-CM-17; EFSB-NO-2). The Company stated that a dielectric mineral oil (pipe fluid) would then be added to the pipe once all the cables are spliced. (Exh. EV-1, at 6-7). After final cable installation and testing, Eversource would restore roadway pavement permanently in accordance with the street restoration standards as required by the Department in D.T.E. 98-22, as well as pursuant to any agreement made with the applicable municipality or agency (RR-EFSB-18). Eversource noted that Section 9.16 of D.T.E. 98-22 states that “[t]he

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<sup>35</sup> Deeper installation may be required in areas of high utility density in order to cross under existing pipes and conduits (Exhs. EV-1, at 6-4; EFSB-CM-6).

[m]unicipality shall have jurisdiction to determine the pavement repair method to be utilized on all pavements which have been installed for less than five years” (*id.*).<sup>36</sup>

The Company anticipates that construction activities required to install, test, commission, and energize the New Line would be completed over the course of two construction seasons, from April 2017 to December 2018 (Exhs. EV-1, at 1-16; EFSB-G-12(1); RR-EFSB-47). According to Eversource, this schedule estimate takes into account winter construction moratoria for street openings in Winchester, Medford, Somerville, and Boston (RR-EFSB-21). The Company noted that some municipalities do not allow any in-street construction during winter moratoria periods, while others may allow limited construction (Tr. 3, at 349). Eversource has not yet determined whether it would request waivers for winter construction moratoria, and its preliminary Project schedules assume no construction during each municipality’s winter moratorium (RR-EFSB-47).

Eversource reported that for crossing of the MBTA railroads, it would employ trenchless techniques, including jack-and-bore and HDD (Exh. EFSB-LU-3). The Company noted that the MBTA indicated a preference for a jack-and-bore technique for crossing under its railroad tracks because of the additional soil support the method provides (RR-EFSB-50; Tr. 2, at 223). Along the Primary Route, Eversource proposed to employ a jack-and-bore technique for crossing beneath the MBTA railroad at Wedgemere Station in Winchester and for crossing the MBTA Haverhill Line in Somerville near Sullivan Square (Exh. EFSB-CM-27; RR-EFSB-12(S-1)). For the alternative Sullivan Square MBTA crossing using the Proposed Variation, the Company stated it would submit proposed jack-and-bore plans to the MBTA (RR-EFSB-50).<sup>37</sup> Along the Noticed Alternative Route, the Company proposed to use the jack-and-bore technique to cross

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<sup>36</sup> Paving on Winthrop Street in Medford, from Lawrence Street through Winthrop Circle to Mystic Valley Parkway, as well as paving on Route 38 from South Street to Temple Street, was completed in the summer of 2015 (Exh. EFSB-T-15; RR-EFSB-39; Tr. 4, at 528-531).

<sup>37</sup> Eversource noted that it originally proposed to use the HDD method at this location because the jack-and-bore method would require a jacking pit 45 to 50 feet deep, which the Company characterized as “non-routine” (Tr. 2, at 221-222). However, because of MBTA’s preference of the jack-and-bore techniques, Eversource would submit a detail jack-and-bore plan to the MBTA’s engineering team (RR-EFSB-50).



the MBTA railroad in Winchester, and HDD<sup>38</sup> for crossing the MBTA railroad in Everett (Exhs. EFSB-LU-3; EFSB-LU-11). Eversource stated that the HDD technique would be used to cross the Upper Mystic River along the Primary Route, and the Malden River along the Noticed Alternative Route (Exh. EFSB-LU-3). The Company stated that it would use an open-cut trench method for crossing the Aberjona River along the Primary Route (Exh. EFSB-CM-27).

C. Environmental Impacts

1. Land Use

a. Company Description

The Company stated that land use along the Primary Route and the Noticed Alternative Route includes residential use, commercial/industrial use, and sensitive receptors including city parks, recreation and open space areas, schools, daycare facilities, hospitals, fire stations, and elder care facilities, with residential land use being the most prevalent (Exh. EV-1, at 6-12, 6-16). Eversource stated that potential land use impacts along both Project routes include access constraints and disruptions associated with construction (*id.* at 6-17). In order to compare the Primary Route and the Noticed Alternative Route and to identify appropriate mitigation measures, the Company assessed land use density by the number of individual residences, commercial/industrial properties, and sensitive receptors along both routes (*id.* at 6-12, 6-16). The Company also used Article 97 land and roadway crossings to compare the two routes (*id.* at 6-32).<sup>39</sup> Land use along the Primary Route and the Noticed Alternative Route is summarized in Table 4, below.

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<sup>38</sup> Eversource stated that it has chosen the HDD over the jack-and-bore method at this location because of the physical constraint of the bore entry placement and workspace on the south side of the Revere Beach Parkway/Route 99 Rotary and associated ramps, and because of the observed rock ledge on both sides of the crossing (Exh. EFSB-LU-11). The Company also noted that in addition to these constraints, the bore length at this location would exceed 425 feet, rendering the jack-and-bore option not practicable (*id.*).

<sup>39</sup> According to the Company, Article 97 of the Amendments to the Constitution of Massachusetts provides that state-owned lands and easements originally taken or acquired as natural resource land cannot be used or disposed of for other purposes except by a law enacted by a two-thirds vote of each branch of the Legislature (Exh. EV-1,

**Table 4. Summary of Land Use within 300 feet of Edge of Pavement**

Distance from Edge of Pavement	Primary Route (7.2 in-street miles)			Alternative Route (9.1 miles)		
	Residences	Commercial/Industrial	Other	Residences	Commercial/Industrial	Other
0-25'	81	25	0	126	45	2
25-50'	555	6	0	336	26	0
50-100'	145	10	4	150	43	2
100-200'	338	10	2	466	37	6
200-300'	380	3	0	473	37	2
<b>Total</b>	<b>1499</b>	<b>54</b>	<b>6</b>	<b>1551</b>	<b>188</b>	<b>12</b>

Source: Exh. EFSB-LU-1(1)(R-3).

Eversource stated that both the Primary Route and the Noticed Alternative Route cross Article 97 lands and roadways (Exh. EV-1, at 6-32). The Primary Route crosses three Article 97 parklands: (1) DCR Upper Mystic Lake Reservation along the Aberjona River in Winchester; (2) the DCR Mystic Valley Reservation MacDonald Park along the Upper Mystic River in Medford; and (3) Ryan Playground, owned and operated by the City of Boston (*id.*). MacDonald Park also hosts a community garden (Medford Community Gardens) (*id.*). For the crossing of the Article 97 parklands near the Aberjona River and Mystic River, the Company indicated that it would request legislative approval for a permanent easement from DCR (RR-EFSB-23; Tr. 3, at 355-358).<sup>40</sup> The Company indicated that the Noticed Alternative Route also includes sections along lands and roadways subject to Article 97 and managed by DCR, including land associated with the Malden River, and short segments of roadways along the DCR Revere Beach Parkway and the Mystic Valley Parkway (Exh. EV-1, at 6-32). Eversource stated that there are no additional Article 97 lands or roadways along the Proposed Variation (RR-EFSB-12(S-1)).

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at 5-16). The Company states that property in the care, custody or control of DCR is subject to Article 97 (*id.*).

<sup>40</sup> The proposed easements are estimated as 20 feet wide by 648 feet near the Aberjona River, and 20 feet wide by 630 feet long near the Upper Mystic River in Medford (Tr. 3, at 355-358; RR-EFSB-23).

The Company noted that it has received a “no-take”<sup>41</sup> determination from the National Heritage and Endangered Species Program (“NHESP”) on its Massachusetts Endangered Species Act (“MESA”) Project review checklist filing for both the Primary Route and the Noticed Alternative Route (Exh. EFSB-LU-7(S-1); Tr. 3, at 375 to 376).

Eversource stated that the Primary Route is a shorter route that passes fewer residential, commercial/industrial land uses, and would result in lower impacts during construction activities (Exh. EV-1, at 6-16). The Company also concluded that the Primary Route and the Noticed Alternative Route are comparable with regard to Article 97 lands and roadways because both routes cross Article 97 lands and roadways that are subject to similar regulatory requirements (id. at 6-32 to 6-33).

With respect to land uses in the vicinity of the Proposed Variation, Eversource stated that adjacent land use is primarily commercial and includes several parcels used for MBTA maintenance service operations along Arlington Avenue and Beacham Avenue (RR-EFSB-12(S-1)). The Company stated that compared to the original Primary Route, the Primary Route with the Proposed Variation passes two more residences and one fewer commercial building (id.). Eversource concluded that access constraints and disruption impacts between the Primary Route with and without the Proposed Variation are comparable and do not appreciably affect the choice between the two route options (id.). The Company noted that it would need to obtain four private permanent easement rights for construction of the Project using the Primary Route (id.).<sup>42</sup> In contrast, using the Proposed Variation would eliminate the

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<sup>41</sup> According to the Company, the “no-take” determination by the NHESP indicates that the Project as proposed will not impact rare species and, therefore, there are no specific mitigation requirements (Tr. 3, at 376).

<sup>42</sup> The Company would require private property easements at three locations in Somerville: (1) 75 Mystic Avenue (I-93 Somerville LLC); (2) 20 Assembly Square (EEO LLC); and (3) off Assembly Square Drive (Federal Realty Investment Trust) (RR-EFSB-44). In addition, the Company would require an easement from the Town of Winchester under a portion of property known as the “Wedgemere T-Station Parking lot” with an address of 42 Bacon Street (RR-EFSB-44(S-1)).

necessity to acquire any private property easement rights, and would only require Eversource obtain permanent easement rights from the City of Boston (id.).<sup>43</sup>

In order to minimize disruption and access constraints during construction, Eversource stated it would closely coordinate with municipal officials (including police, fire, school department, and parks and recreation) to implement work schedules and appropriate mitigation measures (Exh. EV-1, at 6-17). The Company indicated that it has not yet determined or secured Project construction staging and laydown areas, which Eversource stated would be the responsibility of its selected contractor (Exh. EFSB-CM-12).

In its initial discussions with the municipalities and DCR regarding mitigation of Project impacts on parks, Eversource stated that it could potentially limit construction in parkland to the period from November through April, when public use of parks is diminished (Exh. EFSB-LU-19; Tr. 3, at 343-345). For mitigating Project impacts on the Medford Community Gardens along the Primary Route, the Company stated it has committed to representatives of the Medford Community Gardens that it would limit construction to the period October 1 to April 30 (Exh. EFSB-LU-8; Tr. 3, at 385). Eversource stated that it may need to temporarily relocate several garden beds as a result of the Project and would use tarps to protect the soil of any planting beds that would not be temporarily relocated, but would reassemble and restore the beds to the same or better condition after construction is finalized (Exh. EFSB-LU-8). The Company stated that these and other commitments regarding the Medford Community Gardens would be memorialized in a future Host Community Agreement (“HCA”) between the Company and the City of Medford (Exh. EFSB- LU-8; Tr. 3, at 381-386).<sup>44, 45</sup>

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<sup>43</sup> In order to accomplish the Haverhill Line MBTA crossing along the Proposed Variation near Sullivan Square, Eversource stated that it would need to obtain property easement rights from the City of Boston (RR-EFSB-12(S-1)).

<sup>44</sup> At the July 15, 2015 public hearing, a representative of the Medford Community Gardens stated that the group drafted a plan to help ensure disruption at the garden is minimized and expressed hope that the plan would be considered an “order of conditions” for the Company (Public Hearing Transcript, July 15, 2015, at 2). In addition, the representative proposed that Eversource build a natural play area on a 3,260-square foot land beside the community garden (id. at 21).

<sup>45</sup> A current or future Medford HCA is not part of the record in this case.

The Company stated that it is continuing to develop the MBTA crossing designs for the Primary Route with and without the Proposed Variation, and is advancing negotiations with the City of Boston to obtain permanent easement rights needed for the Proposed Variation (RR-EFSB-49).

b. Position of the Parties

i. City of Somerville

Somerville recommends that the Project avoid the former Circuit City site and Home Depot properties, so as to maximize future development potential for these locations (RR-EFSB-49). Further, Somerville asserts that the Project would disrupt recently completed infrastructure and roadways serving the Assembly Row area (Exh. EFSB-5, at 1). Instead, Somerville supports the Proposed Variation, which would avoid the Assembly Row area (RR-EFSB-51). Somerville also urges the Company to continue to engage and collaborate with the City regarding stakeholder outreach, construction phase impact mitigation, and traffic mitigation (RR-EFSB-49).

ii. Company

The Company indicates that it is continuing to investigate the Proposed Variation, which is preferred by the City of Somerville (Company Brief at 57). Eversource also indicates that it is continuing discussions with the MBTA, MassDOT and the Cities of Boston and Somerville regarding the location, design and permitting approach to advancing both MBTA railroad crossing options, including the Company's plans to advance its negotiations with those entities to obtain permanent easement rights (*id.* at 58).

Eversource argues that both the Primary Route and the Proposed Variation have similar impacts to the built environment (*id.* at 58). The Company notes that the City of Somerville has opposed the traversing of the Home Depot parking lot, and states that it is continuing to design and seek permits for the Proposed Variation because of the risks associated with obtaining approvals from the City of Somerville and acquiring private property rights for the site (*id.* at 58-59). The Company stated it would continue to collaborate with Somerville to

implement appropriate best management practices including developing detailed traffic management and outreach plans for residents and businesses (RR-EFSB-49).

c. Analysis and Findings

The record shows that compared to the Noticed Alternative Route the Primary Route is a shorter route (by nearly two miles) that passes fewer residential and commercial/industrial land uses, and would result in lower impacts during construction activities. The record also shows that the Primary Route and the Noticed Alternative Route each cross park lands and roadways subject to Article 97 jurisdiction and are comparable with regard Project Article 97 impacts. Accordingly, the Siting Board finds that the Primary Route (with and without the Proposed Variation) is preferable to the Noticed Alternative Route with respect to land use impacts.

In order to address Somerville's concerns regarding the Primary Route, the Company identified a Proposed Variation that would avoid crossing the Home Depot parking lot and potential adverse effects on the continuing redevelopment of the Assembly Row area. The Primary Route and the Primary Route with the Proposed Variation have comparable land use impacts given their proximity and location in commercial/industrial areas. The record shows that Eversource is continuing to develop the MBTA crossing design for the Primary Route (with and without the Proposed Variation), and is advancing negotiations with the City of Boston to obtain permanent easement rights needed for the Proposed Variation. To avoid disruption of redevelopment activity in the Assembly Row area, the Company shall first take all actions necessary to pursue the construction of the Proposed Variation. Should the construction of the Proposed Variation prove infeasible (due to the inability to obtain necessary permits or other significant impediments), the Company may instead follow the Primary Route without the use of the Proposed Variation. If the Company determines that the use of the Proposed Variation is infeasible, the Company shall notify the Siting Board for its review. Such notification shall be in writing as soon as possible, but in no event fewer than 60 days prior to the commencement of construction, and shall provide the reasons therefor. The Company shall at the same time provide a copy of any such notice to the parties and limited participants.

In order to mitigate impacts of the Project on recreational parklands, the Company committed to limiting construction to non-peak use months (i.e., November through April). The Company also committed to constructing near the Medford Community Gardens only from October 1 to April 30, and to covering existing beds that are not relocated with tarps. The Company noted that these and other commitments regarding the Medford Community Gardens would be memorialized in the Company's HCA with the City of Medford. Therefore, the Siting Board directs the Company to provide to the Board the final provisions for the Medford Community Gardens as agreed to in the HCA or otherwise with the City of Medford before the commencement of construction.

Given the implementation of the mitigation measures proposed by the Company and the conditions described above, the Siting Board finds that land use impacts of the Primary Route (with and without the Proposed Variation) would be minimized.

2. Wetlands and Waterways
  - a. Company's Description
    - i. Primary Route

As previously described, the Primary Route for the Project crosses the Aberjona River in Winchester, and crosses the Mystic River twice – at an upper Mystic River crossing in Medford and a lower Mystic River crossing in Charlestown (Exh. EV-1, at 6-30).<sup>46</sup> For crossing the Aberjona River on the Primary Route, Eversource proposes an open-cut trench method, while it proposes to use HDD for the upper Mystic River crossing (Exh. EFSB-CM-27). For the lower Mystic River crossing, the Company stated there is an existing spare pipe across the river which it would use for the crossing (Exh. EV-1, at 6-30). The Primary Route also crosses the 100-foot buffer of Winter Pond in Winchester (Exh. EV-1, at 6-31).

The Company stated that the Aberjona River crossing would be accomplished by an open trench method, protected by a coffer dam and pump-around system (Exh. EFSB-CM-27). The Company proposes to install a sump pump within the coffer dam footprint to collect any

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<sup>46</sup> The Proposed Variation is located in a highly urban or built environment with no wetlands, streams or rivers (RR-EFSB-12(S-1)).

groundwater which would be filtered to lower turbidity before being discharged back to the Aberjona River downstream (Exh. EFSB-W-6). The Company stated that its evaluation of HDD and jack-and-bore methods revealed that both methods would require the removal of numerous trees to accommodate equipment staging, and would necessitate extended lane closures, resulting in challenging traffic conditions (Exh. EFSB-CM-27). The Company estimated that HDD and jack-and-bore operations could take six to eight weeks and eight to ten weeks respectively, while the open-cut trench method is expected to take ten to fourteen days (*id.*). Eversource stated that proposed open-cut trench construction plans would be subject to review by the Winchester Conservation Commission, Massachusetts Department of Environmental Protection (“MassDEP”), and the U.S. Army Corps of Engineers (“ACOE”) (Exh. EFSB-W-6).

The Company stated that trench construction would result in temporary in-river and riverbank resource alterations (Exh. EV-1, at 6-30). Eversource stated that potential impacts associated with this Aberjona River crossing include the clearing of approximately 23 trees, addition of sediment to the Aberjona River from vegetation removal and soil disturbance within the work area, and removal of up to 250 cubic yards of saturated soil from the coffer dam which would be hauled off-site (Exhs. EFSB-W-3, EFSB-LU-18; Tr. 3, at 402; RR-EFSB-25). Eversource stated that the saturated soil would be dewatered on-site and then hauled off-site, and that the coffer dam area would be backfilled with suitable material after construction is completed (Tr. 3, at 401-402). The Company stated that the Project would likely require a Section 401 Water Quality Certification from MassDEP (RR-EFSB-25).<sup>47</sup> In order to mitigate Project impacts on the Aberjona River, and based on a request made by the Winchester Conservation Commission and the Winchester Department of Recreation, Eversource stated that it would prepare a restoration plan that would include the replacement of trees that would be removed for the Project, and eradication of invasive species following construction (Tr. 3, at 370). For invasive species management, the Company stated that it would coordinate with DCR on its preferred method (*id.* at 372). Additional mitigation measures proposed by the

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<sup>47</sup> The Company indicated that the thresholds for a Section 401 Water Quality Certification are: (1) the dredging of greater than 100 cubic yards of sediment; or (2) impacts that affect greater than 5,000 square feet of a regulated land under water (Tr. 3, at 397).



Company include establishing sedimentation and erosion controls between work areas and sensitive resource areas (Exh. EFSB-W-3).

According to Eversource, impacts associated with trenchless river crossing methods such as HDD at the upper Mystic River crossing would be limited to temporary alterations within regulated resource areas as defined in the Massachusetts Wetlands Protection Act (“WPA”) and 310 C.M.R. § 10.02, including Land Under Water, Bank, Bordering Land Subject to Flooding (100-year floodplain), the 100-foot buffer of the Bank, and the 200-foot Riverfront Area (Exh. EV-1, at 6-30).<sup>48</sup> At the upper Mystic River HDD crossing in Medford, potential Project impacts include sediment discharges to the Mystic River and to an unnamed perennial stream as a result of soil disturbance within the work area (Exhs. EFSB-CM-27; EFSB-W-3). The Company stated that no clearing of trees would be required to stage the HDD because the area is already cleared (Tr. 3, at 397). As with the Aberjona River crossing, the Company’s proposed mitigation measures for the upper Mystic River crossing include establishing sedimentation and erosion controls between the limits of work and adjacent resource areas (Exh. EFSB-W-3).

The Primary Route also crosses the 100-foot buffer of Winter Pond in Winchester (Exh. EV-1, at 6-31). In the vicinity of Winter Pond, the Company stated that the new transmission line would be installed under the pavement of Woodside Road and through the top of a stone culvert, requiring the removal of stones from the culvert (Exh. EFSB-W-4). In order to limit Project impacts at Winter Pond and adjacent resource areas, Eversource stated that appropriate best management practices such as sedimentation and erosion controls and catch basin filter sacks would be used (id.). The Company also stated that it would take care to avoid discharge of soil or stones into Winter Pond when removing the stones to install the New Line, and that the stones would be repointed upon completion of construction (id.).

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<sup>48</sup> The Company stated that preliminary assessment of the open-cut trench method at this location revealed that the coffer dam and pump-around system would be extremely challenging to set up given the width of the river in this location (Exh. EFSB-CM-27). The Company also stated that although a jack-and-bore method was feasible, it would result in workspace limitations and longer construction duration of eight to ten weeks (id.).

The Upper Mystic River and Aberjona River crossings are subject to Chapter 91 Waterways regulations administered by the MassDEP, as well as review under Section 404 of the Clean Water Act regulations (Exh. EV-1, at 6-31). The Company stated that the Project along the Primary Route is subject to a Notice of Intent “NOI” application submittal for work in the 100-Buffer of Bordering Vegetative Wetland and “Pond” and work within Riverfront Area as defined in the WPA regulation (id.). According to Eversource, there are existing Chapter 91 licenses that were issued in 1963 for the Existing Line under the Upper Mystic River and Aberjona River; therefore, Chapter 91 authorizations could be obtained for these crossings with a Final Order of Conditions that would be issued from local conservation commissions under the WPA (id.). The Company stated that there is an existing Chapter 91 license obtained in the early 1960s for the lower Mystic River crossing in Charlestown that covers the existing spare conduit, and specifies that Project work in the lower Mystic River would not require any modification to the Chapter 91 license (Tr. 3, at 391 to 392). The Company stated that none of the river crossings along the Primary Route (with and without the Proposed Variation) would affect public access to waterways (Exh. EV-1, at 6-40, Tr. 3, at 390-392).

ii. Noticed Alternative Route

The Noticed Alternative Route crosses the Malden River, the Aberjona River, and Winter Pond (Exh. EV-1, at 6-30). The Company stated that the installation of a new electric transmission line under the Malden River would require the Company to obtain a new Chapter 91 license from MassDEP, and undergo a review under Section 404 of the Clean Water Act regulation and Section 10 of the Federal Rivers and Harbors Act of 1899 administered by the ACOE (id. at 6-31). Eversource stated that it would use the HDD technique to cross the Malden River (Exh. EFSB-LU-3). The Company also stated that similar to the Primary Route, the Project along the Noticed Alternative Route is subject to a NOI application submittal for work in the 100-Buffer of Bordering Vegetative Wetland and “Pond” and work within Riverfront Area as defined in the WPA regulation (Exh. EV-1, at 6-31).

Comparing the Project impacts on wetland and waterways resources along the Primary Route (with and without the Proposed Variation) and the Noticed Alternative Route, the

Company concluded that because both route options cross Winter Pond the same way and because each involves two new river crossings, there is no appreciable difference between Project wetland and water resource impacts along the two routes (id.). Eversource stated that it would work with DCR and local conservation commissions to develop a mitigation plan that minimizes overall resource area impacts as well as impacts to DCR park lands located on either side of all crossings (id.; Exh. EFSB-W-3). The Company stated that none of the river crossings along the Primary Route (with and without the Proposed Variation) or the Noticed Alternative Route would affect public access to waterways (Exh. EV-1, at 6-40).

b. Analysis and Finding

The record shows that the Primary Route (with and without the Proposed Variation) and the Noticed Alternative Route would involve two new river crossings and work in 100-foot buffer of Winter Pond, and are both comparable in terms of potential Project wetland impacts. The record also shows that crossings along both the Primary Route and the Noticed Alternative Route are subject to similar regulations (Chapter 91 Waterways regulations administered by the MassDEP, and review under regulations administered by the ACOE), and that none of the river crossings would affect public access to waterways. Accordingly, the Siting Board finds that the Primary Route (with and without the Proposed Variation) and the Noticed Alternative Route are comparable with respect to wetland and waterways impacts.

The Company proposes Project impact mitigation on wetland resources along the Primary Route (with and without the Proposed Variation) including implementation of erosion and sedimentation controls, implementation of a restoration plan that includes planting trees and managing invasive species, as well as offsets of any permanent, temporary impacts, as required by local, state, and federal agencies including local conservation commissions, MassDEP, DCR and the ACOE. The Siting Board directs the Company to continue to work with local conservation commissions, MassDEP, and DCR to implement preferred restoration and mitigation plans that are consistent with applicable rules and regulations of the Commonwealth. Furthermore, the Siting Board directs the Company to provide to the Siting Board a copy of the

restoration plan that includes landscaping and invasive species management plans at least 30 days before the commencement of construction.

With implementation of the Company's proposed wetland mitigation and conformance with the above conditions, the Siting Board finds that impacts to wetlands and waterways along the Primary Route (with and without the Proposed Variation) would be minimized.

### 3. Traffic

#### a. Company Description

##### i. Primary Route

Eversource stated that many segments of the Primary Route are used for commuter, truck, and local traffic during peak travel times, and that a majority of the Primary Route experiences daily high-volume traffic during weekdays (Exhs. EV-1, at 6-17, 6-37; EFSB-T-5). The Company assessed traffic congestion along the Primary Route using information obtained from geographic information system ("GIS") sources, aerial photography, and field reconnaissance (Exh. EV-1, at 6-17). In addition, the Company performed a full analysis of Project construction impacts by including hourly traffic volume counts and determining Level of Service ("LOS") at eleven intersections along the Primary Route (Exhs. EFSB-T-2(S-1); EFSB-RR-32).<sup>49</sup>

Of the eleven intersections that the Company studied, ten of them were reported as traffic category LOS E or LOS F at peak periods between 7:00 a.m. to 9:00 a.m. in the morning, and between 3:00 p.m. and 6:00 p.m. in the evening (Exh. T-2(S-1)(1) at 6).<sup>50</sup> The Company's

<sup>49</sup> LOS is a measure of the average amount of delay (in seconds) a motorist experiences at an identified intersection (Exh. EFSB-T-2(S-1)(1) at 5). LOS designations range from A to F, with LOS A representing the best operating traffic conditions and LOS F representing the worst operating traffic conditions (id.).

<sup>50</sup> The ten intersections are: Cambridge Street at Maffa Way (Sullivan Square); Mystic Avenue Northbound at McGrath Highway (Fellsway Southbound); Mystic Avenue at I-93 Exit 30 ramps; Mystic Avenue at Harvard Street/Mystic Valley Parkway; Main Street at Mystic Valley Parkway/South Street; Mystic Valley Parkway at Winthrop Street (Route 38 and Route 16); Winthrop Street at High Street (Winthrop Square); Winthrop Street at Suffolk Street/Lawrence Road; Winthrop Street at Playstead Road; and Church Street at Bacon Street/Fletcher Street.

traffic analysis states that Project construction would require travel lane restrictions and/or lane closures (id.). According to the Company, full road closures are expected only during manhole installation along relatively narrow roads (id.). The Company's traffic analysis finds that "restricting the traveled way will reduce capacity and result in traffic delays" (id.).

The Company determined that 33 percent of the length of the Primary Route has the potential for high traffic congestion (Exh. EV-2, at 6-22). There are 83 intersections along the Primary Route (id. at 6-19). The Primary Route consists of approximately 3.9 miles of road segments with public bus route service and 83 bus stops (id. at 6-22).

According to Eversource, the primary advantage of working during the day is greater worker safety and visibility (Tr. 4, at 546). However, the Company explained that nighttime work is appropriate when the following characteristics are present:

1. The segment experiences high traffic volumes and congestion during the day;
2. The adjacent land uses are primarily commercial and/or industrial; and
3. The municipality (or Massachusetts Department of Transportation ("MassDOT"), in the case of roads under state jurisdiction) has required the Company to construct at night (Exh. EFSB-T-10).

The Company explained that the main advantage of nighttime construction is that it can minimize traffic congestion by avoiding peak hour traffic volumes and potential business disruption (Exh. EFSB-T-10).

Although the Company could not yet identify which specific Project segments would be assigned to nighttime work, the Company stated that it anticipates that it would have a mix of day and nighttime work along the Project route (Tr. 4, at 546). The Company confirmed that Mystic Avenue satisfies the first two criteria described above, but also offered that there is a good possibility that the Company could work on Mystic Avenue during the day and still maintain an acceptable level of traffic (id. at 544).<sup>51</sup>

The Company provided a preliminary staging plan that identified the lane closures and parking restrictions associated with Project construction (RR-EFSB-42). Construction on the

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<sup>51</sup> At the end of evidentiary hearings, the Company had not yet engaged local and state authorities concerning nighttime construction (RR-EFSB-45).

portion of the route in Winchester would be one lane with alternating two-way traffic, with the exception of the portion of Main Street from Grove Street to the Medford border which would be two lanes (RR-EFSB-42(1); Tr. 4, at 517-519). Winthrop Street in Medford would be a combination of two-lane traffic, and one lane with alternating two-way traffic, based on the location of the duct-bank (RR-EFSB-42(1); Tr. 4, at 594). South Street in Medford would be limited to one lane, with one-way traffic, necessitating a detour (RR-EFSB-42(1)). Mystic Avenue would maintain a full lane in each direction, closing a lane in each direction (id.; Tr. 4, at 543 to 545).

The Company stated that it has prepared a draft construction staging plan for the Primary Route (RR-EFSB-42; Tr. 4, at 569). According to the Company, a staging plan is a map that shows the conduit line, the manhole locations, and relevant work zones (RR-EFSB-42; Tr. 4, at 554, 613). The Company stated that the staging plan is used to evaluate the approximate amount of space that is needed for a work zone as compared to the available roadway width, thereby identifying how much roadway is left to maintain ongoing traffic flow during construction (Tr. 4, at 554-555). Based on this information, the Company stated that its traffic engineer would be able to evaluate an array of temporary traffic options (such as alternating traffic, two-way traffic, closing and detouring, etc.) along the Project route (Exh. EFSB-T-13). The Company stated that it would seek input from relevant agencies and municipalities on appropriate working hours based on the Company's presentation of its staging plan (Tr. 4, at 555-556). The staging plan information would then be incorporated into the Company's Traffic Management Plan ("TMP") (id. at 556).

According to the Company, the TMP specifies allowable and negotiated work hours within or outside of the public way, construction vehicle routing, contractor staging areas for equipment and materials, sequence of construction, and any limitations on operations (Exh. EV-1, at 6-37). The Company explained that the TMP also consists of any public outreach to be done related to the management of traffic within the Project area, as well as temporary traffic control plans developed as part of the design and roadway permitting process to be used by the contractor to execute the work within the public way (id.).

The Company stated that it would meet with stakeholders, such as municipal and other agency officials, to share the draft TMP and to discuss the implementation of the temporary traffic options and construction work hours along the Project route (Exhs. RR-EFSB-45; Tr. 4, at 539, 614). The Company would also meet with abutting property owners and businesses to determine individual abutters' delivery schedules, access needs, and other specific traffic-related information (Exh. EFSB-T-3).

The Company stated that it would consider and incorporate the following potential traffic mitigation actions into its TMP: coordination with police and fire departments; provisions for emergency vehicle access; development of lane location adjustments and safe travel widths within the work zone to maintain safe traffic movement and promote safe passage; establishment of work schedules and duration of proposed lane closures, road closures, and/or detours where necessary; installation of appropriate traffic-control devices such as barricades, reflective barriers, advance warning signs, traffic regulation sign (Exh. EV-1, at 6-37 to 6-38). In addition, the Company would incorporate the following potential traffic mitigation actions into its TMP: provision for sufficient routing and safeguarding of pedestrian and bicycle traffic; provision for continuity of MBTA, school bus and private motor coach routes; and communication with adjacent businesses and municipal officials, and provision for communication to the public of the timing and duration of closed curbside parking spaces and travel restrictions (id.).

For those intersections exhibiting a LOS of E or F, the Company proposes the following additional mitigation measures:

- Limitation of work to low-volume traffic hours, such as working during off-peak traffic periods, per agreement with municipalities or other authorities with jurisdiction over the road (i.e., MassDOT);
- Use of police details to move traffic efficiently through intersections;
- Use of sign boards in advance of construction to encourage vehicles to seek alternate routes;
- Identification of detour routes that are most capable of handling traffic flow; and
- Maintaining access and loading zones (RR-EFSB-35).

The Company stated that it would notify municipal officials, residents, businesses, and representatives of other sensitive receptors that abut the Project route, of upcoming scheduled

construction (Exhs. EFSB-LU-13; EFSB-T-3). Eversource stated that it would use a combination of mail, e-mail, telephone and/or door-to-door outreach methods for notification (Exhs. EFSB-LU-13; EFSB-T-3). The Company indicated that it has established a telephone hot-line and an e-mail address that can be contacted 24 hours a day, and committed that Project representatives would return phone calls and e-mail inquiries within 48 hours of receipt (RR-EFSB-37; Tr. 4, at 516).<sup>52</sup> Eversource also indicated that to respond to non-English language questions that may arise, it would obtain Spanish, Portuguese, or other language interpreters (Exh. EFSB-LU-13).

ii. Noticed Alternative Route

The Noticed Alternative Route is approximately 2.0 miles longer than the Primary Route (Exh. EV-2, at 6-24). Eversource stated that a majority of the Noticed Alternative Route includes daily high-volume commuter traffic including the major regional road network and commuter roads of Route 38, Route 60, and Route 16/Mystic Valley Parkway and Revere Beach Parkway and Route 99/Broadway (*id.* at 6-19). There are 106 intersections along the Noticed Alternative Route (*id.*). The Company determined that 40 percent of the length of the Noticed Alternative Route has a high potential for traffic congestion (*id.* at 6-22). In terms of bus route length and number of bus stops, the Noticed Alternative Route consists of approximately 5.6 miles of road segments with public bus route service and 106 bus stops (*id.*).

b. Analysis and Findings

Based on the above, construction along both the Primary Route and the Noticed Alternative Route would result in significant traffic impacts. However, based on the greater length of the Noticed Alternative Route compared to the Primary Route (with and without the Proposed Variation), as well as the Noticed Alternative Route's greater number of intersections, percentage of total length judged to have a high potential for traffic congestion, longer segments with MBTA service, and more MBTA bus stops, the Siting Board finds that the Primary Route

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<sup>52</sup> The Company's Project hotline phone number is 1-844-646-8427 (RR-EFSB-37). The Company can also be reached at [Info@MA-NHSolution.com](mailto:Info@MA-NHSolution.com).



(with and without the Proposed Variation) is preferable to the Noticed Alternative Route with respect to traffic.

The record shows that traffic is one of the most significant construction impacts associated with the Project given that there is already moderate to high traffic along much of the Primary Route, especially during peak commuter periods. Specifically, there are a significant number of affected intersections along the Primary Route in Medford and Winchester that are rated LOS E or LOS F even before experiencing the potential for further degradation as a result of the construction of the Project. Construction at intersections and associated streets that already experience LOS E or LOS F is best limited to non-peak hours to avoid further exacerbating high traffic volume and congestion. Further, given that Mystic Avenue is highly trafficked and the adjacent land uses are primarily commercial and/or industrial, the Siting Board notes the potential to utilize nighttime construction.

As noted by the Company, the final TMP, including number of work crews, work hours and traffic control measures, would be heavily affected by the relevant municipalities who have jurisdiction over the street opening permit process. The Siting Board encourages the Company, state, and local authorities to give careful consideration to the application of the following two criteria, which the Company identified as relevant in deciding whether to require nighttime construction:

1. Whether the segment experiences high traffic volumes and congestion during the day; and
2. The adjacent land uses are primarily commercial and/or industrial.<sup>53</sup>

Further, state and local authorities should give careful consideration to time of day limitations that restrict construction during peak traffic hours at intersections where traffic is rated LOS E or LOS F.

The Siting Board notes that the Company has indicated that, as part of the TMP, it would address community outreach and notification to residents and businesses relevant to traffic

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<sup>53</sup> Nighttime construction generally is not preferable in residential neighborhoods because of the noise impacts on local residents. Accordingly, construction hours typically are limited to daytime hours in residential areas. See Section VI.C.4.

issues. Because the Project requires approximately 7.2 miles of in-street construction through five communities, the TMP likely would be an extensive document. Community outreach and notification will be critical to the success of the Project for all impacts. As a result, the Siting Board directs Eversource, in consultation with Woburn, Winchester, Medford, Somerville, Boston, and Everett to develop a separate, comprehensive outreach plan for the Project. The outreach plan should describe the procedures to be used to notify the public about: the scheduled start, duration, and hours of construction in particular areas; the methods of construction that will be used in particular areas (including any use of nighttime construction); and the anticipated street closures and detours. The outreach plan should also include information on complaint and response procedures, Project contact information, the availability of web-based project information, and protocols for notifying the MBTA and schools of upcoming construction.

The Siting Board also directs the Company to submit to the Siting Board a copy of the TMPs in draft form when they are submitted to the town or towns. Thereafter, the final TMPs shall be submitted to the Siting Board and all other parties when available, but no less than two weeks prior to the commencement of construction, and published on the Company's Project website.

With the implementation of the TMP condition and schedule-related conditions imposed below in Section VI.C.4, the Siting Board finds that traffic impacts from construction and operation of the Project along the Primary Route (with and without the Proposed Variation) would be minimized.

4. Noise

a. Company Description

i. Primary Route

The Company stated that noise from construction of the Project may result in temporary elevated sound levels above ambient conditions near sensitive receptors, such as residences and businesses along the Project route (Exh. EV-1, at 6-38).<sup>54</sup> According to the Company, typical

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<sup>54</sup> The Company did not identify any differences concerning noise between the Primary Route and the Proposed Variation.

trench excavation work associated with the installation of cable in the street would produce typical sound levels of 82 to 90 dBA at a distance of 50 feet (*id.* at 6-23). The Company reported that the closest residence to the proposed construction was measured to be approximately 17 feet, where construction sound levels were estimated to be between 66 and 92 dBA (RR-EFSB-48). The number of residences, businesses, and sensitive receptors and the expected construction noise levels along the Primary Route is shown in Table 5 below.

**Table 5. Primary Route and Noticed Alternative Route Construction Noise Impacts**

Land Use	Primary Route No. of Units	Noticed Alternative Route No. of Units	Anticipated Noise Level at 50 feet <sup>55,56</sup>	Company field measurements <sup>57</sup>
Residential Housing Units	1024	1196	82 to 90 dBA	57 to 83 dBA
Residences within 50 feet of manhole installation (subset of total residential housing units)	13	Not available	82 to 90 dBA	57 to 83 dBA
Commercial/Industrial Buildings	119	112	82 to 90 dBA	57 to 83 dBA
Businesses within 50 feet of manhole location (subset of total commercial/industrial units)	2	Not available	82 to 90 dBA	57 to 83 dBA
Sensitive Receptors	20	27	82-90 dBA	57 to 83 dBA

Source: Exhs. EV-1, at 6-15, 6-23; EFSB-NO-2; RR-EFSB-48.

<sup>55</sup> Thalheimer, E, “Construction Noise Control Program and Mitigation Strategy at the Central Artery/Tunnel Project,” Noise Control Eng. Journal 48(5), 2000 Sept.-Oct.

<sup>56</sup> U.S. Environmental Protection Agency (“USEPA”), Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances prepared by Bolt, Baranek and Newman, Report No. NTID300.1, December 31, 1971.

<sup>57</sup> As a comparison, the Company recorded field measurements of noise levels from a comparable underground transmission line installation (RR-EFSB-48). Noise measurements were hand-recorded by the Company in the field in October and November 2015 at an underground transmission line installation (*id.*).

The Company stated that noise levels from construction experienced by a person inside a building would be attenuated significantly by the structure (Exh. EFSB-NO-6, at 2). According to the Company, sound levels can be expected to be reduced by up to 17 dBA in homes even with windows open, and up to 27 dBA lower indoors with the windows closed (id.).

Noise sources from cable pulling and cable splicing at manhole locations would include a generator, a cable-pulling motor, an air conditioner, and a splicing van (Exh. EFSB-NO-13). Cable splicing would occur on a 24-hour basis, as continuous work hours are required to complete the splicing once started (Exhs. EFSB-NO-3; EFSB-CM-17).<sup>58</sup> The Company estimated that maximum noise impacts from splicing associated with use of the diesel-powered generator would be approximately 69 to 76 dBA at the closest receptor, a distance of 17 feet (EFSB-RR-48). Cable splicing would typically require five days per splice joint, or five to seven days for a specialty splice location known as a full-stop anchor joint (Exhs. EFSB-CM-17; EFSB-CM-20; Tr. 2, at 323-324).<sup>59</sup>

The Company stated that construction noise impacts at both Woburn and Mystic Substations would be generated from typical construction activities including concrete removal, truck movements, heavy equipment operations, backhoe excavation, vacuum excavation, dump truck loading, concrete delivery, pavement operations and general construction activities (Exh. EFSB-NO-7). According to the Company, heavy machinery would be used intermittently throughout the Project's construction phases, and this activity may temporarily increase nearby sound levels during usage periods (id.).

The Company stated that it would require its contractors to implement the following construction noise mitigation measures: (1) use well-maintained equipment with functioning

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<sup>58</sup> The Company stated that HDD construction is not a continuous operation, and would occur during general construction hours (Tr. 3, at 433-435). HDD at the upper Mystic River crossing would take approximately two to seven days with maximum noise levels at the nearest residence estimated to be 65 dBA (RR-EFSB-29).

<sup>59</sup> The Company stated that full-stop anchor joints allow the Company to sectionalize the oil in the cable (Tr. 4, at 507-509). Eversource stated that it would install two to four full stop anchor joints adjacent to one or more river crossings along the route (RR-EFSB-20).

mufflers; (2) comply strictly with the Massachusetts anti-idling law (G.L. c. 90, § 16A) and MassDEP's Anti-Idling Regulations, 310 C.M.R. § 7.11(1)(b), to prevent equipment from idling and producing unnecessary noise; (3) operate stationary noisy equipment, such as whole tree chippers or compressors, away from nearby residences, where flexibility exists to do so; and (4) attend training that highlights the Company's requirements with respect to well-maintained equipment, anti-idling and other relevant policies (Exh. EV-1, at 38). In addition, the Company indicated that its contractors would be required to demonstrate that they have selected the quietest generators and portable HVAC units reasonably available (Exh. EFSB-NO-3).

As a matter of Company policy, the Company stated that it does not consider the use of temporary noise barriers unless a complaint is made that cannot be resolved through other measures such as using quieter equipment (Exh. EFSB-NO-10). According to the Company, the use of such equipment could pose hazards to workers and the general public, such as difficulty in anchoring these types of systems (id.).

The Company's proposed typical construction hours are Monday through Friday, 7:00 a.m. to 5:00 p.m., and Saturdays from 9:00 a.m. to 5:00 p.m. (Exh. EV-1, at 6-8).<sup>60</sup> The Company stated that in some instances, due to activities that must be conducted continuously (e.g., cable splicing), unforeseen circumstances, weather events, or schedule exigencies, extended work may be proposed on the weekends or beyond normal operating hours (id.; Exhs. EFSB-NO-4; EFSB-T-5). The Company acknowledges that it may be necessary to modify these hours by limiting construction to off-peak daytime or nighttime hours along some segments of the Project route (Exh. EFSB-T-5). Eversource maintained that it would coordinate with municipal officials, and construction activities would comply with applicable municipal ordinances and bylaws (id.; Exh. EV-1, at 6-37). According to the Company, construction work hours are largely determined by municipalities (or state agencies such as MassDOT) as part of the issuance of road opening permits (Exh. EFSB-T-5; Tr. 4, at 516, 524, 539, 551, 565).

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<sup>60</sup> The Company's proposed 10-hour workday assumes eight hours of in-road work and two hours is required to set up and take down the construction site each day (Tr. 3, at 627-628).

With respect to operational noise from the Project at the substations, the Company stated that there would be no perceptible impact on sound levels outside of the Woburn Substation fence as a result of the addition of the proposed series reactors (Exh. EFSB-NO-18). Eversource reported daytime sound levels at the nearest residential receptors in the range of 39 to 42 dBA, and nighttime sound levels in the range of 35 to 38 dBA (RR-EFSB-31(1) at 47). The Company calculated that the sound contribution from the added series reactor at a distance of 70 feet, which is the closest residence to the Woburn Substation, would be approximately 26 dBA, which is below the ambient sound levels set forth above (Exh. EFSB-NO-18). Therefore, the Company maintained that for all practical purposes, the addition of a second set of series reactors would have no perceptible impact on sound levels outside of the station fence (id.). Further, the Company stated that there would be no additional noise from Mystic Substation because the Company is not adding any new sound producing equipment (Exh. EFSB-NO-7). These minimal operational impacts are the same for either route (see Exh. EFSB-NO-7).

ii. Noticed Alternative Route

Because the same equipment would be used regardless of which route is chosen, the maximum noise impacts on the Noticed Alternative Route would be the same, with typical trench excavation work associated with the installation of cable in the street producing typical sound levels of 82 to 90 dBA at a distance of 50 feet (Exh. EV-1, at 6-23). There are approximately 1,196 residential housing units, 112 commercial/industrial buildings, and 27 sensitive receptors along the Noticed Alternative Route (Exh. EV-2, at 6-15). As noted above, the Noticed Alternative Route is approximately 2.0 miles longer than the Primary Route (id. at 6-24).

iii. Analysis and Findings

With regard to operational noise associated with the proposed Project, there would be minimal, if any, increase in existing noise levels. Construction of the Project would have appreciable noise impacts along the entire route, and particularly in residential areas in Woburn, Winchester, and Medford. The record shows that Project construction noise could be as high as

92 dBA at the outside edge of the closest residential structures. This represents an appreciable noise impact at intervals as the Project is constructed, especially in residential areas.

The relative impact of construction-related sound along the Primary and Noticed Alternative Routes depends largely on the total length of the active work zone and the proximity of residents, commercial businesses, and pedestrians along each route. Based on the greater length of the Noticed Alternative Route compared to the Primary Route, as well as the lower number of residential housing units and sensitive receptors along the Primary Route compared to the Noticed Alternative Route, the Siting Board finds the Primary Route (with and without the Proposed Variation) to be preferable to the Noticed Alternative Route with respect to noise impacts.

Receptor locations that would have the longest duration of construction noise impacts would be adjacent to manhole locations, where manholes would need to be installed and cables pulled and then spliced on a continuous 24-hour basis; non-trench locations; and the Woburn Substation. In order to minimize sound impacts during cable splicing in particular, which occurs continuously over a 24-hour period, the Siting Board directs the Company to use the quietest generators and portable HVAC units reasonably available to them. In addition, when the Company operates stationary noise equipment, such as whole tree chippers or compressors, the Siting Board directs that such equipment be located as far away as possible from nearby residences, where flexibility exists to do so, to reduce noise impacts on residences. A comparison of existing noise levels with noise levels likely to be generated by the cable splicing operation suggests that nighttime cable splicing could be disruptive in those residential areas where operations are in particularly close proximity to homes. The Siting Board therefore directs Eversource to use portable noise barriers to mitigate the noise impact of nighttime generator operation wherever cable splicing operations are staged within 60 feet of a residential structure.<sup>61</sup>

The Siting Board finds that, with the exception of Saturday construction, the Company's proposed construction hours are reasonable. Saturday work at the Woburn Substation is

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<sup>61</sup> As noted in Section VI.C.3 (Traffic), nighttime construction may be appropriate where adjacent land uses are primarily commercial and/or industrial.

permitted but limited to large equipment deliveries and to quiet assembly and testing activities. See NSTAR Electric Company d/b/a Eversource Energy, D.P.U. 15-85, at 27 (2016) (“Woburn Substation”).<sup>62</sup> Because the in-street construction is in close proximity to many residential areas, including some where homes are within 50 feet of the right-of-way, the Siting Board directs the Company to limit construction of the transmission line to Monday through Friday from 7:00 a.m. to 5:00 p.m., and subject to municipal authorization, Saturday from 9:00 a.m. to 5:00 p.m. (from the Woburn Substation property line to the intersection of South Street and Main Street in Medford). Work that necessarily has a longer required continuous duration than normal construction hours allow, such as cable splicing, shall be exempted from this condition. Should the Company need to extend construction work beyond those hours and days (with the exception of emergency circumstances on a given day that necessitate extended hours), the Siting Board directs the Company to seek written permission from the relevant municipal authority before the commencement of such work, and to provide the Siting Board with a copy of such permission. If the Company and municipal officials are not able to agree on whether such extended construction hours should occur, the Company may request prior authorization from the Siting Board and shall provide the relevant municipality with a copy of any such request.<sup>63</sup>

The Company shall inform the Siting Board and the relevant municipality in writing within 72 hours of any work that continues beyond the hours allowed by the Siting Board. The Company shall also send a copy to the Siting Board, within 72 hours of receipt, of any municipal authorization for an extension of work hours. Furthermore, the Company shall keep records of the dates, times, locations, and durations of all instances in which work continues beyond the hours allowed by the Siting Board, or, if granted extended work hours in writing by a

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<sup>62</sup> In Woburn Substation, the Company stated that Saturday construction activities would be limited to large equipment deliveries, and to quiet assembly and testing activities. Woburn Substation at 27. Therefore, the Siting Board allowed the Company to construct on Saturday from 9:00 a.m. to 5:00 p.m., with Saturday construction activities limited to large equipment deliveries and to quiet assembly and testing activities. Id.

<sup>63</sup> If required by traffic or other relevant municipal considerations, a local municipal authority may impose further restrictions on the Company’s construction hours as part of the local street-opening permit process applicable to the Company (Tr. 4, at 524-525).



municipality, work that continues past such allowed hours, and must submit such record to the Siting Board within 90 days of Project completion.

With the implementation of the above noise conditions, the Siting Board finds that noise impacts from construction and operation of the Project (with and without the Proposed Variation) would be minimized.

5. Air, Visual, Soil Management, and Safety

a. Air

Regardless of the route chosen, the Company stated that it would minimize the potential for airborne dust from construction activities by requiring its contractors to place water trucks with misters in or near the work areas (Exh. EV-1, at 6-39). The Company also stated that it would comply with state laws concerning vehicle idling (id.). To minimize air emissions from equipment operation, the Company stated that it would direct its contractors to retrofit any diesel-powered, non-road construction equipment rated 50 horsepower or above, whose engine is not certified to 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 (id.).

Regardless of the route chosen, the Company stated that the Project would involve approximately 300 pounds of additional sulfur hexafluoride gas (“SF<sub>6</sub>”) added to the switchgear at Mystic Substation (Exh. EFSB-A-2). According to the Company, the new switchgear will be designed for an annual emission rate of 0.1 percent, which the Company states would be in compliance with MassDEP’s standard of 1.0 percent per year, as set forth in 310 C.M.R. § 7.72 (Exh. EFSB-A-3). The Company maintains that the amount of SF<sub>6</sub> is small in relation to the Company’s total system, that the Company expects no change in overall emissions (id.).

b. Visual

Regardless of the route chosen, the Company stated that the only permanent visual impact from the Project is the view of the series reactors from the public access trail outside of the Woburn Substation fence (Exhs. EFSB-V-5; EFSB-V-5(1); Tr. 3, at 409-412). The

Company proposed to provide landscaping outside of the station fence in the rear corner of the station that would screen or soften the view of the series reactors (id.).

The Company reported that it would provide landscaping in connection with a restoration plan near the Aberjona River once construction is complete (Exhs. EFSB-LU-18; EFSB-LU-18(1); EFSB-V-3; Tr. 2, at 330-332). The Company also proposed to develop a restoration/mitigation plan for trees the Company would remove to facilitate construction along the Mystic and Aberjona River Crossings (Exh. EFSB-V-3). The Company stated it would coordinate this restoration plan with DCR and local municipalities (id.).

c. Soil Management

According to the Company, trench excavation in the roadways along the Primary and Noticed Alternative Route poses the potential to encounter contaminated soil resulting from historical contaminant releases (Exh. EV-1, at 6-24). The Company states that there are 15 active Massachusetts Contingency Plan (“MCP”) sites adjacent to or within 500 feet of the Primary Route (Exh. EFSB-HW-2). By comparison, there are approximately 16 MCP sites along the Noticed Alternative Route (id.). Regardless of which route is selected, the Company maintains that the Project may result in the excavation of materials that have been contaminated by historical releases of oil, hazardous materials, or urban fill (Exhs. EFSB-HW-2; EV-1, at 6-39). However, the Company concluded that because the Primary Route is considerably shorter than the Noticed Alternative Route, there is less potential for land disturbance and encountering MCP sites along the Primary Route (Exh. EV-1, at 6-35; Tr. 3, 386-388). To evaluate soil management options during construction, the Company indicated that it would conduct a multi-phase soil pre-characterization program that would include soil sample collection and testing (Exh. EFSB-HW-1).

d. Safety

Regardless of which route is chosen for the Project, the Company maintains that the safety of its construction would be accomplished through adherence to all federal, state, and local regulations, as well as industry standards and guidelines established for protection of the public

(Exhs. EFSB-S-1; EFSB-S-2). At a minimum, the Company states that all construction sites would adhere to the Federal Highway Administration's Manual of Uniform Traffic Control Devices to ensure that both vehicular and pedestrian traffic are safely routed around all street and curbside construction activities (Exh. EFSB-S-1). According to the Company, the Project would be designed, constructed and maintained in accordance with the Massachusetts Code for the Installation and Maintenance of Electric Transmission Lines (220 C.M.R. § 125.00) and the National Electric Safety Code (Exh. EV-1, at 6-41). In addition, the Company stated that open trenches either would be covered with plates or back-filled when not in use or monitored by construction personnel (Exh. EFSB-S-1).

Eversource stated that the dielectric fluid that would be used in the New Line is a highly refined petroleum-based mineral oil (Exh. EV-1, at 6-7). Tanker trucks would deliver the dielectric fluid into the pipe within a closed system, and the fluid would not be exposed to the environment (id.).

e. Analysis and Findings

Based on the above, the Siting Board finds that the air impacts are comparable for the Primary Route (with and without the Proposed Variation) and the Noticed Alternative Route. Because the transmission line will be located underground primarily within public streets along either the Primary or Noticed Alternative Route, any visual impacts would be limited to the terminal substations. Accordingly, the Siting Board finds that the visual impacts are comparable for the Primary Route (with and without the Proposed Variation) and the Noticed Alternative Route. Based on the information currently available, the Siting Board finds that the soil management and safety impacts are also comparable for both routes.

Eversource committed to dust control measures during Project construction, such as spraying water at worksites. The Company also stated that it would comply with state law and regulations concerning engine idling. Further, as the Company has agreed, the Siting Board directs the Company to ensure that all diesel-powered non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of the Project construction have USEPA-verified (or equivalent) emission control devices, such as

oxidation catalysts or other comparable technologies (to the extent that they are commercially available) installed on the exhaust system side of the diesel engine.

The Company will be purchasing new switchgear equipment for the Mystic Substation that complies with MassDEP regulations for SF<sub>6</sub>.<sup>64</sup> The Siting Board directs the Company to inform the Siting Board if it adds SF<sub>6</sub> to any equipment or replaces any equipment due to SF<sub>6</sub> loss at Woburn Substation and Mystic Substation within five years of the completion and initial operation of the Project, after which time the Company will consult with the Siting Board to determine whether the Siting Board deems it appropriate to require continued reporting. So that the Siting Board can stay informed of Eversource's overall progress to reduce SF<sub>6</sub> emissions, the Board directs the Company to submit to the Siting Board a copy of its annual SF<sub>6</sub> reports to MassDEP.

With the proposed measures to minimize dust and air emissions from construction equipment and the Company's selection of low-leakage SF<sub>6</sub> containing equipment, as well as the conditions outlined above, the Siting Board finds that potential air impacts from construction and operation of the Project along the Primary Route (with and without the Proposed Variation) would be minimized.

The Project would have no material permanent visual impacts. See also Woburn Substation at 16. The Company's proposed restoration of various areas along the route, including landscaping in connection with a restoration plan near the Aberjona River, is reasonable. Given implementation of the visual mitigation measures proposed by Eversource, the Siting Board finds that visual impacts from the Project along the Primary Route (with and without the Proposed Variation) would be minimized.

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<sup>64</sup> The Massachusetts Clean Energy and Climate Plan for 2020 identifies SF<sub>6</sub> as a non-toxic but highly potent greenhouse gas ("GHG") and estimates one pound to have the same global warming impact as eleven tons of carbon dioxide ("CO<sub>2</sub>"). See G.L. c. 21N. Reducing SF<sub>6</sub> emissions is an important policy goal of the Clean Energy and Climate Plan. The Siting Board's mandate requires it to ensure the consistency of new energy facilities with the Commonwealth's current health, environmental protection, and resource and development policies. In accordance with this mandate, the Siting Board reviews the Company's proposed use of SF<sub>6</sub> to ensure reduction of SF<sub>6</sub> emissions to the maximum extent possible.

With respect to potentially contaminated soils, the record shows that the Company would conduct a multi-phase soil pre-characterization program that would include soil sample collection and testing. The Siting Board directs the Company to comply with all applicable federal and state laws concerning the excavation and disposal of any contaminated soils that the Company encounters in the construction phase of the Project. With these measures, the Siting Board finds that contaminated soil impacts from construction of the Project along the Primary Route (with and without the Proposed Variation) would be minimized.

The Company committed to following all relevant safety laws and regulations during construction. Based on the Company's proposed safety mitigation measures, the Siting Board finds that potential safety impacts from Project construction for the Primary Route (with and without the Proposed Variation) would be minimized.

6. Magnetic Fields

a. Background

Electrical current in the Proposed Cables would create magnetic fields since magnetic fields are created whenever current flows in a conductor (Exh. EV-3, app. 6-1, at 2). Some epidemiological studies have suggested a statistical correlation between exposure to magnetic fields and childhood leukemia. Salem Cables at 83; Footprint Power Salem Harbor Development LP, 19 DOMSB 151, EFSB 12-2, at 99 (2013); Sithe Mystic Development, LLC, 9 DOMSB 101, EFSB 98-8, at 88-89 (1999). However, the 2007 World Health Organization ("WHO") reports "the evidence for a causal relationship is limited, therefore exposure limits based upon epidemiological evidence are not recommended, but some precautionary measures are warranted." Salem Cables at 83. The Siting Board has recognized public concern about electric and magnetic fields ("EMF") and has encouraged the use of low-cost measures that would minimize magnetic fields along transmission ROWs. See Salem Cables, at 88.<sup>65</sup>

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<sup>65</sup> Once connected, cables also create electric fields since electric fields are created whenever voltage is present on conductors. However, electric fields are shielded by earth, so underground cables would not create above-ground electric fields. Therefore, this section reviews only the magnetic fields that the Project would induce. Salem Cables at 84, n.48.

b. Company Description

The Company modeled above-ground magnetic field strengths from “average” and peak projected line loadings for year 2018, along the Primary Route (Exh. EV-1, at 6-29). For those circumstances, the Company compared the expected magnetic fields between a scenario assuming the New Line is built and a scenario where only the Existing Line was present (Exh. EV-1, at 6-29). For average loadings, with only the Existing Line, the maximum field value at three feet above the ground would be 0.76 milligauss (“mG”) (Exh. EV-3, app. 6-1, at 8). With the New Line added, the maximum field value would be 0.83 mG, for the same loading (*id.*, app. 6-1, at 10). For maximum loading, with only the Existing Line, the maximum field value at three feet above the ground would be 4.1 mG (*id.*). With the New Line added, the maximum field value would be 3.6 mG (*id.*). In each case, the Company indicated that field strength would drop rapidly with distance from the lines (*id.*, app. 6-1, at 8, 9).<sup>66</sup> Finally, the Company stated that field strengths along the Noticed Alternative Route would be similar to the Primary Route, and that the surrounding magnetic fields would likewise be similar (Exh. EV-1, at 6-30).

Regardless of which route is selected, the Company noted that the magnetic fields from the proposed underground cables are reduced by (a) close positioning of the three phases, and (b) shielding via a steel pipe surrounding the cables (Exh. EFSB-MF-2). According to the Company, the ferromagnetic steel pipes enclosing each set of transmission line phase conductors considerably attenuate the magnetic field that would be produced by the phase conductors alone, in the absence of the steel pipe (Exh. EV-3, app. 6-1, at 6). The Company estimated that the shielding efficiency by ferromagnetic materials suggests that for bundled three-phase cables, the surrounding ferromagnetic material reduces the magnetic fields by 25- to 30-fold below that for unshielded cables (*id.*). The Company maintained that these design features contribute to the

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<sup>66</sup> The Company also provided magnetic field modeling for locations where a shallow trench depth would be required. According to the Company, with only the Existing Line, the maximum field value at three feet above the ground would be 13.5 mG at peak projected load (Exh. EFSB-MF-1(1)). With the New Line added, the maximum field value would be 11.7 mG at peak projected load (*id.*).

slight reduction of magnetic field strength under maximum load conditions with installation of the New Line versus existing conditions (id.). The Company stated that the Noticed Alternative Route would have similar modeled field values to those described for the Primary Route (Exh. EV-1, at 6-30).

The Company stated that “all field levels along the distribution line routes, including directly overhead, fall below the Massachusetts ROW-edge magnetic field guideline of 85 mG” (Exh. EV-3, app. 6-1, at 10). The Company indicated that it does not expect any adverse health effects due to the magnetic field impacts from the proposed New Line (id.).

c. Analysis and Findings

The record shows that magnetic field strengths along the Primary and Noticed Alternative Routes would be similar. Therefore, the Siting Board finds that the Primary Route (with and without the Proposed Variation) and the Noticed Alternative Route are comparable with respect to the impact from magnetic fields. A number of historical studies appeared to show a statistical association between residential distances from transmission lines and human health effects. GSRP at 85. However, the WHO has stated that the evidence for a causal relationship between magnetic field exposure and childhood leukemia is limited; WHO therefore does not recommend exposure limits based on the epidemiological evidence, but does recommend taking some precautionary measures. Id. Consistent with the WHO recommendations, the Siting Board continues to look for low-cost measures that would minimize exposures to magnetic fields from transmission lines. We note that the Siting Board has not found that by presenting an edge of ROW magnetic field of 85 mG or lower an applicant is presumed to have mitigated environmental impacts and that no further mitigation would ever be required regardless of circumstances. See, e.g., Brockton Power Company, 10 DOMSB 157, EFSB 99-1, at 77-78 (2000) (“Brockton Power”) (previously accepted EMF levels are not a standard limiting acceptable impacts, and do not provide the sole or principal basis for our evaluation of EMF impacts in current reviews). Rather, in prior Siting Board decisions, the Board has recognized public concern about EMF and has encouraged the use of practical and low-cost design to minimize magnetic fields along transmission ROWs. Salem Cables, EFSB 13-2/D.P.U.

13-151/D.P.U. 13-152, at 88 (2014). The Siting Board requires magnetic field mitigation which, in its judgment, is consistent with minimizing cost.

As noted by the Company, the New Line has some beneficial effects in mitigating existing magnetic field strengths, particularly under maximum load conditions. The New Line's close positioning of the three phases, and the use of shielding via a steel pipe surrounding the cables provide substantial mitigation of magnetic field impacts that would otherwise occur. The Siting Board finds that magnetic field impacts for the Primary Route (with and without the Proposed Variation) and the Noticed Alternative Route would be similar, and that magnetic field impacts from construction and operation of the Project, using the Primary Route (with and without the Proposed Variation), would be appropriately minimized.

#### 7. Summary of Environmental Impacts

The Siting Board finds that the information the Company provided regarding the Project's environmental impacts is substantially accurate and complete. In comparing the environmental impacts along the two routes, the Siting Board finds that the Primary Route (with and without the Proposed Variation) would have lower land use, traffic, and noise impacts than the Noticed Alternative Route, largely related to the longer length of the Noticed Alternative Route. The two routes are comparable with respect to water resources and wetlands, air, visual, soil management, magnetic field, and safety impacts. On balance, the Siting Board finds that the Primary Route (with and without the Proposed Variation) is preferable to the Noticed Alternative Route with respect to environmental impacts.

#### D. Cost

The Company estimated the cost to construct the Project using the Primary Route to be \$81.5 million, which is a planning grade estimate with a target accuracy of -25 percent to +25 percent (Exh. EFSB-C-1 (Supp)). This estimate does not include the cost of purchasing certain necessary private property easements, which might increase the total price by up to \$1.7 million (RR-EFSB-12(S-1)). The total estimated cost includes \$2.1 million for the Woburn Substation improvements and \$6.1 million for the Mystic Substation improvements, the costs of



which would be similar using either the Primary Route or the Noticed Alternative Route (Exh. EFSB-C-1 (Supp)). The remaining new transmission line cost would be approximately \$10.18 million per mile (id.; Exh. EV-1, at 6-44). If the Company were to build the Proposed Variation it would be approximately the same as the cost of the Primary Route after including the cost of necessary easements for the Primary Route (RR-EFSB-12(S-1). According to the Company the cost of the Project using the Noticed Alternative Route would be \$101.86 million, assuming the same cost per mile over a longer 9.2 mile route (Exhs. EV-1, at 6-44; EFSB-C-1 (Supp)). Accordingly, the Siting Board finds that the Primary Route (with and without the Proposed Variation) is preferable to the Noticed Alternative Route with respect to cost.

#### E. Reliability

The Company evaluates several considerations when assessing the reliability of transmission projects, including the location of the transmission facilities, total exposure (length) to faults, the type of transmission structures (e.g., underground facilities are generally protected from faults caused by weather and tree constraints), and maintenance and repair accessibility (Exh. EV-1, at 6-43). The Company maintains there is no difference in terms of the physical factors related to reliability between the Primary Route and the Noticed Alternative Route, given both the Primary Route (with and without the Proposed Variation) and the Noticed Alternative Route are in urban settings, and that the line will be located underground (id.). The Company does not consider the shorter length of the Primary Route to provide a material advantage in reliability over the Noticed Alternative Route (id.). The Siting Board finds that the Primary Route (with and without the Proposed Variation) and the Noticed Alternative Route are comparable in terms of reliability.

#### F. Conclusion on Analysis of the Primary and Noticed Alternative Routes

The Siting Board finds that the Primary Route (with and without the Proposed Variation) is preferable to the Noticed Alternative Route with respect to environmental impacts and cost, and that the two routes are comparable with respect to reliability. The Siting Board therefore finds that the Primary Route (with and without the Proposed Variation) is superior to the Noticed

Alternative Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Based on review of the record, the Siting Board finds that the Company provided sufficient information to allow the Siting Board to determine whether the Project has achieved a proper balance among cost, reliability, and environmental impacts. The Siting Board finds that with the implementation of the specified conditions and mitigation presented above, and compliance with all local, state, and federal requirements, the environmental impacts of the Project along the Primary Route (with and without the Proposed Variation) would be minimized. The Siting Board finds that the Project along the Primary Route (with and without the Proposed Variation) would achieve an appropriate balance among conflicting environmental concerns as well as among environmental impacts, reliability, and cost.

## VII. CONSISTENCY WITH POLICIES OF THE COMMONWEALTH

### A. Standard of Review

G.L. c. 164, § 69J requires the Siting Board to determine whether plans for 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.

### B. Analysis and Conclusions

#### 1. Health Policies

In Section 1 of the Electric Utility Restructuring Act of 1997, the Legislature declared that "electricity service is essential to the health and well-being of all residents of the Commonwealth..." and that "reliable electric service is of utmost importance to the safety, health, and welfare of the Commonwealth's citizens..." See St. 1997, c.11, §1(a),(h). In Section III.D above, the Siting Board found that the Project would improve the reliability of electric service in Massachusetts.

In Section VI.C.5, the Siting Board requires the Company to use only retrofitted off-road construction equipment to limit emissions of particulate matter during Project construction. This condition is consistent with MassDEP's Diesel Retrofit Program designed to address health

concerns related to diesel emissions. In Section VI.C, the Siting Board finds that the Project's magnetic field, traffic, hazardous materials, and air impacts have been minimized. Accordingly, subject to the Company's specified mitigation and the Siting Board's conditions set forth in Section XI, below, the Siting Board finds that the Company's plans for construction of the Project are consistent with current health policies of the Commonwealth.

## 2. Environmental Protection Policies

The Global Warming Solutions Act ("GWSA"), enacted in August 2008, is a comprehensive statutory framework to address climate change in Massachusetts. St. 2008, c. 298. The GWSA mandates that the Commonwealth reduce its GHG emissions by 10 to 25 percent below 1990 levels by 2020, and by at least 80 percent below 1990 levels by 2050. G. L. c. 21N, §3(b). The GWSA authorizes the establishment of legally binding limits on GHG emissions in the Commonwealth, and designates the Secretary of Energy and Environmental Affairs ("Secretary") and MassDEP as the entities primarily responsible for implementing the GWSA. G.L. c. 21N, §§ 2-5. In particular, Section 3(d) of the GWSA requires MassDEP to promulgate regulations setting declining annual aggregate GHG emissions limits for sources or categories of sources that emit GHGs, to achieve the 2020 limit. G.L. c. 21N, § 3(d).

Pursuant to the GWSA, the Secretary issued the Massachusetts Clean Energy and Climate Plan for 2020 on December 29, 2010 (the "2020 CECP") and an update dated December 31, 2015 (the "2020 CECP Update") (together, the "Climate Plan"). In a determination accompanying the 2020 CECP, the Secretary set the 2020 state-wide GHG emissions limit at 25 percent below 1990 levels. On May 17, 2016, the Massachusetts Supreme Judicial Court issued a decision finding that MassDEP had not yet issued the GHG-reduction regulations required by GWSA Section 3(d), and it required MassDEP to do so. See Kain v. Department of Environmental Protection, 474 Mass. 278 (2016) ("Kain"). Subsequently, on September 16, 2016, Governor Charles D. Baker issued Executive Order 569, titled "Establishing an Integrated Climate Change Strategy for the Commonwealth" ("Executive Order 569"). Executive Order 569 includes the directive that MassDEP issue regulations pursuant to Section 3(d) no later than

August 11, 2017, “to ensure that the Commonwealth meets the 2020 statewide emissions limit mandated by the GWSA” (Executive Order 569, at 3).

The GWSA obligates administrative agencies, such as the Siting Board to consider reasonably foreseeable climate change impacts and related effects when reviewing permit requests. The Company has shown that the improvement to the transmission system in the Sub-Area B would have no adverse climate change impacts and would, in fact, help ensure system reliability and delivery of grid-generated low carbon electricity (Exh. EV-1, at 7-3). In addition, the Siting Board has found in Section VI.C.5, above that, as specified by the Company, and with additional conditions imposed in this Decision, SF<sub>6</sub> emissions would be minimized.

In Section VI.C, above, the Siting Board reviewed how the Project would meet other state environmental protection requirements. The Siting Board also: (1) considered the Project’s environmental impacts, including those related to land use, wetlands and waterways, traffic, noise, air emissions, visual impacts, and soil management; and (2) concluded that, subject to the specified mitigation and conditions set forth below, the Project’s environmental impacts have been minimized.

The Project is consistent with the Commonwealth’s Environmental Justice (“EJ”) Policy, as updated by Executive Order 552 signed on November 25, 2014.<sup>67</sup> The Company contends that the Project is compliant with the EJ Policy because the Project does not exceed any environmental impact thresholds that would necessitate enhanced analysis under the policy (Company Brief at 90). As noted earlier, based on a linguistic analysis of the populations in the Project area communities, the Presiding Officer directed the Company to: (1) publish the Notice of Public Hearing in Spanish as well as English; and (2) mail and post the Public Hearing Notices in English, Spanish and Portuguese.

Subject to the specified mitigation and conditions set forth in this Decision, the Siting Board finds that the Company’s plans for construction of the Project are consistent with the current environmental protection policies of the Commonwealth.

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<sup>67</sup> On January 31, 2017, EEA issued an updated EJ Policy, entitled “Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs.”

### 3. Resource Use and Development Policies

In 2007, pursuant to the Commonwealth's Smart Growth/Smart Energy policy, EEA established Sustainable Development Principles. Among the principles are: (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 reuse of existing sites, structures and infrastructure; and (3) protecting environmentally sensitive lands, natural resources, critical habitats, wetlands and water resources and cultural and historic landscapes. In Section V, the Siting Board reviewed the process by which the Company selected the route for the Project. The Project has been designed and conditioned to avoid or minimize impacts to natural and cultural resources by being placed in existing underground corridors linking existing substations.

Subject to the specific mitigation and the conditions set forth in this Decision, the Siting Board finds that the Company's plans for construction of the Project are consistent with the current resource use and development policies of the Commonwealth.

### VIII. ANALYSIS UNDER G.L. C. 40A, § 3 - ZONING EXEMPTIONS

Pursuant to G.L. c. 40A, § 3, the Company requests specific individual zoning exemptions from the City of Woburn 1985 Zoning Ordinances, as Amended (the "Zoning Ordinance") needed for work at the Woburn Substation for the proposed Project.

#### A. Standard of Review

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 by-law 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 . . .

Thus, a petitioner seeking exemption from a local zoning bylaw under G.L. c. 40A, § 3 must meet three criteria.<sup>68</sup> 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”). 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. Massachusetts Electric Company, D.T.E. 01-77, at 4 (2002) (“MECo/Westford”; Tennessee Gas Pipeline Company, D.T.E. 01-57, at 3-4 (2002) (“Tennessee/Agawam”). Finally, the petitioner must establish that it requires exemption from the zoning ordinance or bylaw. Boston Gas Company, D.T.E. 00-24, at 3 (2001) (“Boston Gas”).

Additionally, the Siting Board favors the resolution of local issues on a local level whenever possible, to reduce concern regarding any intrusion on home rule. The Siting Board believes that the most effective approach for doing so is for a petitioner to consult with local officials regarding its project before seeking zoning exemptions pursuant to G.L. c. 40A, § 3. Salem Cables at 97; Russell Biomass LLC/Western Massachusetts Electric Company, 17 DOMSB 1, EFSB 07-4/D.P.U. 07-35/07-36, at 61-62 (2009) (“Russell Biomass LLC/WMECo”); New England Power Company d/b/a National Grid, D.P.U. 15-44/15-45, at 62 (“MVRP”). Thus, the Siting Board encourages petitioners to consult with local officials, and in some circumstances, to apply for local zoning permits, before seeking zoning exemptions from the Department under G.L. c. 40A, § 3. Salem Cables at 135; Russell Biomass/WMECo at 68.

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<sup>68</sup> G.L. c. 40A, § 3 applies to the Department. The Department refers zoning exemption cases to the Siting Board for hearing and decision pursuant to G.L. c. 25, § 4. When deciding cases under a Department statute, the Siting Board has the power and the duty:

to accept for review and approval or rejection any application, petition or matter related to the need for, construction of, or siting of facilities referred by the chairman of the department . . . provided, however, that in reviewing such application, petition or matter, the board shall apply department and board standards in a consistent manner.

G.L. c. 164, § 69H.

1. Public Service Corporation

a. Standard of Review

In determining whether a petitioner qualifies as a “public service corporation” (“PSC”) for the purposes of G.L. c. 40A, § 3, the Massachusetts Supreme Judicial Court has stated:

among 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 at 680. See also, Boston Gas at 3-4; Berkshire Power Development, Inc., D.P.U. 96-104, at 26-36 (1997) (“Berkshire Power”).<sup>69</sup>

b. Analysis and Conclusion

The Company is an electric company as defined by G.L. c. 164, § 1 and, as such, qualifies as a public service corporation. Woburn Substation at 6. Accordingly, the Siting Board finds that the Company is a public service corporation for the purposes of G.L. c. 40A, § 3.

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<sup>69</sup> The Department interprets this list not as a test, but rather as guidance to ensure that the intent of G.L. c. 40A, § 3 would be realized, *i.e.*, that a present or proposed use of land or structure that is determined by the Department to be “reasonably necessary for the convenience or welfare of the public” not be foreclosed due to local opposition. See Berkshire Power at 30; Save the Bay at 685-686; Town of Truro v. Department of Public Utilities, 365 Mass. 407 (1974) (“Town of Truro”). The Department has interpreted the “pertinent considerations” as a “flexible set of criteria which allow the Department to respond to changes in the environment in which the industries it regulates operate and still provide for the public welfare.” Berkshire Power, D.P.U. 96-104, at 30; see also Dispatch Communications of New England d/b/a Nextel Communications, Inc., D.P.U./D.T.E. 95-59-B/95-80/95-112/96-113, at 6 (1998). The Department has determined that it is not necessary for a petitioner to demonstrate the existence of “an appropriate franchise” in order to establish PSC status. See Berkshire Power at 31.

2. Public Convenience or Welfare

a. Standard of Review

In determining whether the present or proposed use is reasonably necessary for the public convenience or welfare, the Department must balance the interests of the general public against the local interest. Save the Bay at 680; Town of Truro at 407. Specifically, the Department is empowered and required to undertake “a broad and balanced consideration of all aspects of the general public interest and welfare and not merely [make an] examination of the local and individual interests which might be affected.” New York Central Railroad v. Department of Public Utilities, 347 Mass. 586, 592 (1964) (“NY Central Railroad”). When reviewing a petition for a zoning exemption under G.L. c. 40A, § 3, the Department is empowered and required to consider the public effects of the requested exemption in the State as a whole and upon the territory served by the applicant. Save the Bay at 685; NY Central Railroad at 592.

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 examines: (1) the need for, or public benefits of, the present or proposed use; (2) the present or proposed use and any alternatives or alternative sites identified;<sup>70</sup> and (3) the environmental impacts or any other impacts of the present or proposed use. The Department then balances the interests of the general public against the local interest and determines whether the present or proposed use of the land or structures is reasonably necessary for the convenience or welfare of the public. Boston Gas, D.T.E. 00-24, at 2-6; MECo/Westford at 5-6; Tennessee/Agawam at 5-6; Tennessee Gas Company, D.T.E. 98-33, at 4-5 (1998).

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With respect to the particular site chosen by a petitioner, G.L. c. 40A, § 3 does not require the petitioner to demonstrate that its primary site is the best possible alternative, nor does the statute require the Department to consider and reject every possible alternative site presented. Rather, the availability of alternative sites, the efforts necessary to secure them, and the relative advantages and disadvantages of those sites are matters of fact bearing solely upon the main issue of whether the primary site is reasonably necessary for the convenience or welfare of the public. Martarano v. Department of Public Utilities, 401 Mass. 257, 265 (1987); NY Central Railroad at 591.



b. Analysis

With respect to the need for, or public benefits of, the Project, the Siting Board found in Section III.D, above, that additional energy resources are needed for reliability in the area of the Project. In Section IV, the Siting Board analyzed a number of different project approaches other than the Company's proposed 115 kV transmission line that the Company might use to meet the reliability need (such as the use of NTAs) and concluded that the proposed approach is superior to other approaches. The Siting Board also reviewed the Company's route selection process in Section V, and determined that the Company applied a reasonable set of criteria for identifying and evaluating routes to ensure that no clearly superior route was missed. The Siting Board also compared the benefits of the Primary and Noticed Alternative Routes and concluded that the Primary Route (with and without the Proposed Variation) is superior to the Noticed Alternative Route in providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Finally, regarding Project impacts, in Section V.I, the Siting Board reviewed the environmental impacts of the Project and found that, while the Project may result in some local adverse impacts, the environmental impacts of the proposed Project would be minimized with the implementation of certain mitigation and conditions. Based on the foregoing, the Siting Board finds that the general public interest in constructing the Project outweighs identifiable adverse local impacts. Accordingly, the Siting Board finds that the proposed Project is reasonably necessary for the convenience or welfare of the public.

B. Individual Exemptions Required

1. Standard of Review

In determining whether exemption from a particular provision of a zoning bylaw is "required" for purposes of G.L. c. 40A, § 3, the Department looks to whether the exemption is necessary to allow construction or operation of the petitioner's Project. New England Power

Company d/b/a National Grid, D.P.U. 15-44/15-45, at 7 (2016); Woburn Substation at 35-39 (2016); Tennessee Gas Company, D.P.U. 92-261, at 20-21 (1993).<sup>71</sup>

## 2. List of Exemptions Sought

Table 6 below, summarize: (1) each of the specific provisions of the Zoning Ordinance from which the Company seeks exemptions; (2) the relief available from Woburn through the local zoning process; and (3) the Company's argument as to why it cannot comply with the identified zoning provisions and/or why the available zoning relief is inadequate.

**Table 6. Requested Individual Exemptions from the Woburn Zoning Ordinance -- Summary of Company's Position**

Section of the Zoning Ordinance	Available Relief	Why Exemption is Required: Company's Position
<b>Groundwater Protection District</b> Section 15	None Available	A substation use is not permitted in the R-1 zoning district, and therefore, the Company's proposed use is prohibited in the Groundwater Protection District. The granting of a use variance is not authorized under the Zoning Ordinance.
<b>Groundwater Protection District</b> Earth Removal Section 15, Subsection 6.B.1.viii	None Available	This section prohibits earth removal to within six feet above the historical high groundwater level in a Groundwater Protection District, with exceptions that do not apply to the Project. Although not expected, should excavation occur within six feet of the historical high groundwater elevation, a use variance would be necessary. However, the granting of a use variance is not authorized under the Zoning Ordinance.

Source: Exhs. EV-Petition 3, at 10-11; EFSB-Z-3.

<sup>71</sup> It is the petitioner's burden to identify the individual zoning provisions applicable to the Project and then to establish that exemption from each of those provisions is required:

The 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 would 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.

New York Cellular Geographic Service Area, Inc., D.P.U. 94-44, at 18 (1995).

### 3. Consultation with the Municipality

Prior to seeking zoning relief from the Department, the Company conducted outreach to both local residents and local officials in Woburn (Exhs. EFSB-G-4; EFSB-G-5). The Company stated that it conducted an open house meeting in Woburn on April 27, 2015 to provide the public with an opportunity to interact with subject matter experts on the Company's project team (Exh. EFSB-G-4). The Company also met with city officials, including the mayor, in October and November 2014, and February, March, April, and July 2015 (id.; Exh. EV-1, at 1-14, 1-15; EFSB Petition 3, at exh. F). The City of Woburn provided a letter of support for the Company's decision to seek individual zoning exemptions from the operation of the Zoning Ordinance for the work proposed at the Woburn Substation (Exh. EFSB-Petition 3, at exh. F).

### 4. Analysis and Findings

The Company has identified in Table 6 two provisions of the Zoning Ordinance from which it seeks exemption to minimize delay in the construction and ultimate operation of the Project. The identified zoning provisions relevant to the Project would require the Company to obtain a use variance. However, the granting of a use variance is not authorized under Section 15 of the Zoning Ordinance and, therefore, no local zoning relief is available. As a result, the Siting Board finds that the requested exemptions from Section 15 of the Zoning Ordinance are required within the meaning of G.L. c. 40A, § 3.

With respect to the issue of municipal consultation, the Siting Board continues to favor the resolution of local issues on the local level whenever possible to reduce local concern regarding any intrusion on home rule authority. Salem Cables at 97. Thus, the Siting Board encourages zoning exemption applicants to consult with local officials, and in some circumstances, to apply for local zoning permits, before seeking zoning exemptions from the Department under G.L. c. 40A, § 3. Id. The record shows that the Company consulted with multiple City of Woburn officials before seeking zoning exemptions in this proceeding. In addition, the City of Woburn provided a letter of support for the Company's decision to seek individual zoning exemptions from the operation of the Zoning Ordinance for the work proposed at the Woburn Substation. Accordingly, the Siting Board finds that the Company made a good

faith effort to consult with municipal authorities, and that the Company's communications have been consistent with the requirements set forth in Russell Biomass and later cases addressing such requirements.

5. Conclusion on Request for Individual Zoning Exemptions

As described above, the Siting Board finds that: (1) the Company is a public service corporation; (2) the proposed use is reasonably necessary for the public convenience or welfare; and (3) the specifically named zoning exemptions set forth in Table 6 are required for construction of the Project, within the meaning of G.L. c. 40A, § 3. Additionally, we find that the Company engaged in good faith consultation with the City of Woburn. Accordingly, the Siting Board grants the Company's request for the individual zoning exemptions listed above in Table 6.

IX. ANALYSIS UNDER G.L. C. 164, § 72

A. Standard of Review

General Laws, 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 ... 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.<sup>72</sup>

The Department, in making a determination under G.L. c. 164, § 72, considers all aspects of the public interest. Boston Edison Company v. Town of Sudbury, 356 Mass. 406, 419 (1969).

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<sup>72</sup> Pursuant to G.L. c. 164, § 72, the electric company must file with its petition a general description of the transmission line, a map or plan showing its general location, an estimate showing in reasonable detail the cost of the line, and such additional maps and information as the Department requires.

Among other things, Section 72 permits the Department to prescribe reasonable conditions for the protection of the public safety. Id. at 419-420.

In evaluating petitions filed under G.L. c. 164, § 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. New England Power Company d/b/a National Grid, D.P.U. 12-2, at 37-38 (2012) (“Westborough”); NSTAR Electric Company/New England Power Company d/b/a National Grid, D.P.U. 11-51, at 6 (2012); Boston Edison Company, D.T.E. 99-57, at 3-4 (1999). The Department then balances the interests of the general public against the local interests and determines whether the line is necessary for the purpose alleged and will serve the public convenience and is consistent with the public interest.

B. Analysis and Conclusion

As described above in Sections III through IV, the Siting Board examined: (1) the need for, or public benefits of, the proposed Project; (2) the environmental impacts of the proposed Project; and (3) any identified alternatives. With implementation of the specified mitigation measures proposed by the Company and the conditions set forth by the Siting Board in Section XI, below, the Siting Board finds pursuant to G.L. c. 164, § 72 that the proposed transmission line is necessary for the purpose alleged, would serve the public convenience, and is consistent with the public interest. Thus, the Siting Board approves the Section 72 Petition.

X. SECTION 61 FINDINGS

The Massachusetts Environmental Policy Act (“MEPA”) provides that “[a]ny determination made by an agency of the Commonwealth shall include a finding describing the environmental impact, if any, of the project and a finding that all feasible measures have been taken to avoid or minimize said impact.” G.L. c. 30, § 61. Pursuant to 301 C.M.R. § 11.01(3), these findings are necessary when an Environmental Impact Report (“EIR”) is submitted by a petitioner to the Secretary of Energy and Environmental Affairs, and should be based on such

EIR. Where an EIR is not required, G.L. c. 30, § 61 findings are not necessary. 301 C.M.R. § 11.01(3).<sup>73</sup>

In this case, the record indicates that the Secretary of Energy and Environmental Affairs issued a Certificate on the Environmental Notification Form on June 5, 2015, stating that the Project does not require an EIR (Exh. EFSB-3). Accordingly, Section 61 findings are not necessary in this case.

## XI. DECISION

The Siting Board's enabling statute directs the Siting Board to implement the energy policies contained in G.L. c. 164, §§ 69H to 69Q, to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. G.L. c. 164, § 69H. Thus, an applicant must obtain Siting Board approval under G.L. c. 164, § 69J, prior to construction of a proposed energy facility.

In Section III.D, above, the Siting Board finds that additional energy resources are needed to maintain a reliable supply of electricity to Sub-Area B within the Greater Boston Area.

In Section IV.D, above, the Siting Board finds that the Project is superior to the other alternatives identified with respect to providing a reliable energy supply for the Commonwealth with minimum impact on the environment at the lowest possible cost.

In Section V, above, the Siting Board finds that the Company has developed and applied a reasonable set of criteria for identifying and evaluating alternatives to the Project in a manner that ensures that the Company has not overlooked or eliminated any routes that, on balance, are clearly superior to the Project. The Siting Board also finds that the Company has identified a range of practical transmission line routes with some measure of geographic diversity. Consequently, the Siting Board finds that Eversource has demonstrated that it examined a reasonable range of practical siting alternatives.

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<sup>73</sup> If an EIR were submitted in this case, a finding under G.L. c. 30, § 61 would be necessary for the Company's Zoning Exemption Petition and its Section 72 Petition. Regardless of whether the Company submits an EIR, the Siting Board is not required to make a G.L. c. 30, § 61 finding under G.L. c. 164, § 69J because the Siting Board is exempt from MEPA requirements. G.L. c. 164, § 69I.

In Section VI, above, the Siting Board finds that the proposed facilities along the Primary Route (with and without the Proposed Variation) would be superior to the proposed facilities along the Alternative Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

In Section VI.C, above, the Siting Board reviewed environmental impacts of the Project and finds that with the implementation of the specified mitigation and conditions, and compliance with all applicable local, state and federal requirements, the environmental impacts of the Project along the Primary Route (with or without the Proposed Variation) would be minimized.

In Section VII, above, the Siting Board finds that with the implementation of specified mitigation and conditions, the Project (with and without the Proposed Variation) is consistent with the health, environmental and resource use and development policies of the Commonwealth.

In addition, the Siting Board has found pursuant to G.L. c. 164, § 72, that Eversource's proposed transmission line is necessary for the purpose alleged, and will serve the public convenience and is consistent with the public interest, subject to the following Conditions A through N.

In addition, the Siting Board has found pursuant to G.L. c. 40A, § 3, that construction and operation of the Company's proposed facilities are reasonably necessary for the public convenience or welfare. Accordingly, the Siting Board approves Eversource's Petition for an exemption from certain provisions of the zoning ordinance of the City of Woburn, as enumerated in Section VIII, above.

Accordingly, the Siting Board APPROVES the Company's Petition to construct the Project using the Primary Route (with and without the Proposed Variation), as described herein, subject to the following Conditions A through N.

- A. The Company shall first take all actions necessary to pursue the construction of the Proposed Variation. Should the construction of the Proposed Variation prove infeasible (due to the inability to obtain necessary permits or other significant impediments), the Company may instead follow the Primary Route without the

use of the Proposed Variation. If the Company determines that the use of the Proposed Variation is infeasible, the Company shall notify the Siting Board for its review. Such notification shall be in writing as soon as possible, but in no event fewer than 60 days prior to the commencement of construction, and shall provide the reasons therefor. The Company shall at the same time provide a copy of any such notice to the parties and limited participants.

- B. The Siting Board directs the Company to provide to the Board the final provisions for the Medford Community Gardens as agreed to in the HCA or otherwise with the City of Medford before the commencement of construction.
- C. The Siting Board directs the Company to continue to work with local conservation commissions, MassDEP, and DCR to implement preferred restoration and mitigation plans that are consistent with applicable rules and regulations of the Commonwealth. Furthermore, the Siting Board directs the Company to provide to the Board a copy of the restoration plan that includes landscaping and invasive species management plans at least 30 days before the commencement of construction.
- D. The Siting Board directs Eversource, in consultation with Woburn, Winchester, Medford, Somerville, Everett, and Boston to develop a comprehensive outreach plan for the Project. The outreach plan should describe the procedures to be used to notify the public about: the scheduled start, duration, and hours of construction in particular areas; the methods of construction that will be used in particular areas (including any use of nighttime construction); and the anticipated street closures and detours. The outreach plan should also include information on complaint and response procedures, Project contact information, the availability of web-based project information, and protocols for notifying the MBTA and schools of upcoming construction.
- E. The Siting Board also directs the Company to submit to the Siting Board a copy of the TMPs in draft form when they are submitted to the town or towns. Thereafter, the final TMPs shall be submitted to the Siting Board and all other parties when available, but no less than two weeks prior to the commencement of construction, and published on the Company's Project website.
- F. The Siting Board directs the Company to use the quietest generators and portable HVAC units reasonably available. In addition, when the Company operates stationary noise equipment, such as whole tree chippers or compressors, the Siting Board directs that such equipment be located as far away as possible from nearby residences, where flexibility exists to do so, to reduce noise impacts on residences.



- G. The Siting Board directs Eversource to use portable noise barriers to mitigate the noise impact of nighttime generator operation wherever cable splicing operations are staged within 60 feet of a residential structure.
- H. The Siting Board directs the Company to limit construction of the transmission line to Monday through Friday from 7:00 a.m. to 5:00 p.m., and subject to municipal authorization, Saturday from 9:00 a.m. to 5:00 p.m. (from the Woburn Substation property line to the intersection of South Street and Main Street in Medford). Work that necessarily has a longer required continuous duration than normal construction hours allow, such as cable splicing, shall be exempted from this condition. The Siting Board directs the Company to limit construction at the Woburn Substation to Monday through Friday from 7:00 a.m. to 5:00 p.m., and Saturday from 9:00 a.m. to 5:00 p.m., provided that Saturday work is limited to large equipment deliveries and to quiet assembly and testing activities.

Should the Company need to extend construction work beyond those hours and days (with the exception of emergency circumstances on a given day that necessitate extended hours), the Siting Board directs the Company to seek written permission from the relevant municipal authority before the commencement of such work, and to provide the Siting Board with a copy of such permission. If the Company and municipal officials are not able to agree on whether such extended construction hours should occur, the Company may request prior authorization from the Siting Board and shall provide the relevant municipality with a copy of any such request.

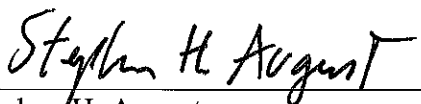
- I. The Siting Board directs that the Company ensure that all diesel-powered non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of Project construction must have USEPA-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies (to the extent that they are commercially available) installed on the exhaust system side of the diesel combustion engine.
- J. The Siting Board directs the Company to inform the Siting Board if the Company adds SF<sub>6</sub> to any equipment or replaces any equipment due to SF<sub>6</sub> loss at the Woburn Substation and Mystic Substation within five years of the completion and initial operation of the Project, after which time the Company will consult with the Siting Board to determine whether the Siting Board deems it appropriate to require continued reporting. The Siting Board further directs the Company to submit to the Siting Board a copy of the Company's annual SF<sub>6</sub> reports to MassDEP.
- K. The Siting Board directs the Company to comply with all applicable federal and state laws concerning the excavation and disposal of any contaminated soils it encounters in the construction phase of the Project.

- L. The Siting Board directs the Company and its contractors and subcontractors to comply with all applicable federal, state, and local laws, regulations, and ordinances from which the Company has not received an exemption.
- M. The Siting Board directs the Company to submit to the Board an updated and certified cost estimate for the Project prior to the commencement of construction. Additionally, the Siting Board directs Eversource to file semi-annual compliance reports with the Siting Board starting within 60 days of the commencement of construction, that include projected and actual construction costs and explanations for any discrepancies between projected and actual costs and completion dates, and an explanation of the Company's internal capital authorization approval process.
- N. The Siting Board directs the Company, within 90 days of Project completion, to submit a report to the Siting Board documenting compliance with all conditions contained in this Decision, noting any outstanding conditions yet to be satisfied and the expected date and status of such resolution.

Because issues addressed in this Decision relative to this facility are subject to change over time, construction of the proposed Project must be commenced within three years of the date of the decision.

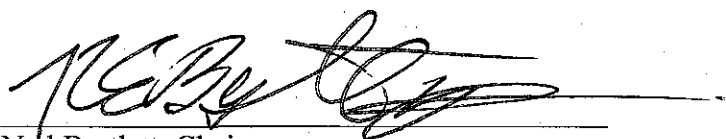
In addition, the Siting Board notes that the findings in this Decision are based upon the record in this case. A project proponent has an absolute obligation to construct and operate its facility in conformance with all aspects of its proposal as presented to the Siting Board. Therefore, the Siting Board requires Eversource, or its successors in interest, to notify the Siting Board of any changes other than minor variations to the proposal so that the Siting Board may decide whether to inquire further into a particular issue. Eversource or its successors in interest are obligated to provide the Siting Board with sufficient information on changes to the proposed Project to enable the Siting Board to make these determinations.

The Secretary of the Department shall transmit a copy of this Decision and the Section 61 findings herein to the Executive Office of Energy and Environmental Affairs and the Company shall serve a copy of this Decision on the City of Woburn, City of Woburn Planning Board, and the City of Woburn Zoning Board of Appeals within five days of its issuance. The Company shall certify to the Secretary of the Department within ten business days of issuance that such service has been made.

  
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Stephen H. August  
Presiding Officer

Dated this 13<sup>th</sup> day of March 2017

APPROVED by the Energy Facilities Siting Board at its meeting on March 10, 2017, by the members present and voting. Voting for the Tentative Decision as amended: Ned Bartlett, Undersecretary of the Executive Office of Energy and Environmental Affairs, Chairman; Angela O'Connor, Chairman of the Department of Public Utilities; Jolette Westbrook, Commissioner of the Department of Public Utilities; Judith Judson, Commissioner of the Department of Energy Resources; Laurel Mackay, Chief Bureau Counsel and designee for the Department of Environmental Protection; Erica Kreuter, MassWorks Infrastructure Program Director, designee for the Secretary of the Executive Office of Housing and Economic Development; Glenn Harkness, Public Member; and Mark C. Kalpin, Public Member.

A handwritten signature in black ink, appearing to read 'Ned Bartlett', is written over a horizontal line.

Ned Bartlett, Chairman  
Energy Facilities Siting Board

Dated this 13<sup>th</sup> day of March 2017

Appeal as to matters of law from any final decision, order or ruling of the Siting Board may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the order of the Siting Board be modified or set aside in whole or in part. Such petition for appeal shall be filed with the Siting Board within twenty days after the date of service of the decision, order or ruling of the Siting Board, or within such further time as the Siting Board may allow upon request filed prior to the expiration of the twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the clerk of said court. Massachusetts General Laws, Chapter 25, Sec. 5; Chapter 164, Sec. 69P.