COMMONWEALTH OF MASSACHUSETTS
ENERGY FACILITIES SITING BOARD

Petition of NSTAR Electric Company d/b/a Eversource Energy for Approval to Construct Two New Underground 115 kV Transmission Lines Through the Cities of Boston, Everett and Chelsea, and to Construct a New Substation in East Boston and to Make Modifications to Existing Substations in Everett and Chelsea, Massachusetts, Pursuant to G.L. c. 164, § 69J	EFSB 14-04
Petition of NSTAR Electric Company d/b/a Eversource Energy for Approval to Construct, Operate, and Maintain Two New Underground 115 kV Transmission Lines Through the Cities of Boston, Everett, and Chelsea, Massachusetts Pursuant to G.L. c. 164, § 72	D.P.U. 14-153
Petition of NSTAR Electric Company d/b/a Eversource Energy Pursuant to Section 6 of Chapter 665 of the Acts of 1956 for Individual and Comprehensive Exemptions from the Boston Zoning Code	D.P.U. 14-154

FINAL DECISION

M. Kathryn Sedor
Presiding Officer
December 1, 2017

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ABBREVIATIONS[1]

Berkshire Power	Berkshire Power Development, Inc., D.P.U. 96-104 (1997)
Boston Gas	Boston Gas Company, D.T.E. 00-24 (2001)
BRA	Boston Redevelopment Authority
CELT	Capacity, Energy, Loads, and Transmission
Chapter 91	Massachusetts General Laws chapter 91
Chelsea Creek Crossing	an existing duct bank crossing under Chelsea Creek
Chelsea/East Boston/Lynn Load Area	a portion of the electric system serving customers in East Boston, Winthrop, Chelsea, and Nahant, as well as portions of Revere, Lynn, Saugus, and Swampscott
City Parcel	City of Boston parcel located at 338 East Eagle Street in East Boston
CMR	Code of Massachusetts Regulations
CO_2	carbon dioxide
Company	NSTAR Electric Company d/b/a Eversource Energy
Crescent Avenue Site	Company-owned parcel of land on Crescent Avenue in Chelsea
CSO	combined sewer outflow
dBA	A-weighted decibels
Department	Massachusetts Department of Public Utilities
DG	distributed generation

[1] 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 in the Abbreviations Table.

DOMSB	Decisions and Orders of Massachusetts Energy Facilities Siting Board
DOMSC	Decisions and Orders of Massachusetts Energy Facilities Siting Council
DR	demand response
East Eagle Substation	proposed 115/14 kV substation on East Eagle Street in East Boston
East Eagle-Chelsea Line	a new approximately 1.5-mile-long underground 115 kV transmission line between the proposed East Eagle Substation and the Chelsea Substation
Eastern Avenue Duct Bank	an existing underground duct bank in Chelsea
EE	energy efficiency
EFSB	Energy Facilities Siting Board
EIR	Environmental Impact Report
EJ	environmental justice
EMF	electric and magnetic fields
FCA	Forward Capacity Auction
GE Lynn	General Electric Lynn industrial facility
GHG	greenhouse gas
GIS	gas-insulated switchgear
Greater Boston Area	a portion of the electric system including the Northeast Massachusetts load zone, and portions of the New Hampshire, Southeastern Massachusetts, and Western Central Massachusetts load zones
G.L. c.	Massachusetts General Laws chapter
GSRP	Western Massachusetts Electric Company, 18 DOMSB 7; EFSB 08-2/D.P.U. 08-105/08-106 (2010)

GWSA	Global Warming Solutions Act
Hampden County	New England Power Company d/b/a National Grid, 18 DOMSB 323; EFSB 10-1/D.P.U. 10-107/10-108 (2012)
Hopkinton	NSTAR Electric Company, D.P.U. 15-02 (2015)
Hz	hertz
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IRP	New England Power Company d/b/a National Grid, 20 DOMSB 1; EFSB 12-1/D.P.U. 12-46/12-47 (2014)
IEEE	Institute of Electrical and Electronics Engineers
ISD	Boston Inspectional Services Department
ISO-NE	ISO-New England
kV	kilovolts
LSP	Licensed Site Professional
Lower SEMA	NSTAR Electric Company, 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
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
mG	milligauss
MODF	mineral oil dielectric fluid
MVA	megavolt-amperes
MW	megawatts

Mystic-East Eagle Line	a new approximately 3.2-mile-long underground 115 kV transmission line between the Mystic Substation and the proposed East Eagle Substation
Mystic-Woburn	NSTAR Electric Company d/b/a Eversource Energy, EFSB 15-03/D.P.U. 15-64/15-65 (2017)
NERC	North American Electric Reliability Corporation
New Lines	the proposed Mystic to East Eagle and East Eagle to Chelsea underground 115 kV transmission lines
NPCC	Northeast Power Coordinating Council
NY Central Railroad	New York Central Railroad v. Department of Public Utilities, 347 Mass. 586 (1964)
NRG	NRG Canal 3 Development LLC, EFSB 15-06/D.P.U. 15-180 (2017)
NSTAR Electric Avenue	NSTAR Electric Company, D.P.U. 13-126/127 (2014)
NSTAR Seafood Way	NSTAR Electric Company, D.P.U. 13-177/178 (2015)
NTA	non-transmission alternative
Project	Proposed East Eagle Substation plus the Mystic to East Eagle and East Eagle to Chelsea underground 115 kV transmission lines
PSC	Public Service Corporation
Russell	Russell Biomass, LLC, 17 DOMSB 1; EFSB 07-4/D.P.U. 07-35/07-36 (2009)
Salem Cables	New England Power Company d/b/a National Grid, 20 DOMSB 129; EFSB 13-2/D.P.U. 13-151/13-152 (2014)
Save the Bay	Save the Bay v. Department of Public Utilities, 366 Mass. 667 (1975)

Section 18 Recommendation	A written recommendation from the BRA to MassDEP regarding whether or not a project would serve a proper public purpose and would not be detrimental to the public's rights in Tidelands
Section 53-13 Standards	Substantive standards to be used by the BRA in developing a Section 18 Recommendation
Section 72 Petition	Eversource petition pursuant to G.L. c. 164, § 72
SF_6	sulfur hexafluoride
Siting Board	Massachusetts Energy Facilities Siting Board
Siting Board Petition	Eversource petition pursuant to G.L. c. 164 § 69J
solar PV	solar photovoltaic
Solutions Study	Greater Boston Area Transmission Solutions Study (2015)
STE	short-time emergency rating
Stoughton/Boston	Boston Edison Company d/b/a NSTAR Electric, 14 DOMSB 233; EFSB 04-1/ D.P.U. 04-5/04-6 (2005)
Streambank Project	local emergency streambank protection project announced by USACE in November 2015
Substation	proposed 115/14 kV substation on East Eagle Street in East Boston
Substation site	proposed location of the East Eagle Substation
THI	temperature and humidity indices
TMP	Traffic Management Plan
Town of Truro	Town of Truro v. Department of Public Utilities, 365 Mass. 407 (1974)
USACE	United States Army Corps of Engineers

USEPA	United States Environmental Protection Agency
Walpole-Holbrook	NSTAR Electric Company d/b/a Eversource Energy, EFSB 14-2/D.P.U. 14-73/14-74 (2017)
WHO	World Health Organization
Worcester	New England Power Company d/b/a National Grid, 18 DOMSB 173; EFSB 09-1 /D.P.U. 09-52/ 09-53 (2011)
Working Group	Greater Boston Area working group led by ISO-New England
Zoning Petition	Eversource petition pursuant to G.L. c. 40A § 3
2015 Needs Assessment	Greater Boston Updated Transmission Needs Assessment (2015)

TABLE OF CONTENTS

Pursuant to G.L. c. 164, § 69J, the Massachusetts Energy Facilities Siting Board ("Siting Board" or "Board") hereby APPROVES, subject to the conditions set forth below, the Petition of NSTAR Electric Company d/b/a Eversource Energy ("Eversource" or "Company") to construct two new underground 115 kV transmission lines in the cities of Chelsea, Everett, and Boston, and a new 115/14 kilovolt ("kV") substation in East Boston, Massachusetts. Pursuant to G.L. c. 14, § 72, the Siting Board hereby APPROVES, subject to the conditions set forth below, the Petition of Eversource for a determination that the proposed new 115 kV transmission lines are necessary, serve the public convenience, and are consistent with the public interest. Pursuant to G.L. c. 40A, § 3 and Section 6 of Chapter 665 of the Acts of 1956, the Siting Board hereby APPROVES, subject to the conditions set forth below, the Petition of Eversource for individual and comprehensive exemptions from the City of Boston Zoning Code in connection with the proposed transmission facilities, as described herein.

I. INTRODUCTION

A. Summary of the Proposed Transmission Project

Eversource proposes to construct, operate, and maintain: (1) a new 115 kV underground transmission line, approximately 3.2 miles in length, from the Company's Mystic Substation in Everett to a Company-owned parcel on East Eagle Street in East Boston; and (2) an approximately 1.5-mile 115 kV underground transmission line from the East Eagle Street parcel to the Company's Chelsea Substation in Chelsea (together the "New Lines") (Exh. EV-2, at 1-1R).[2,3] The Company also proposes to construct, operate, and maintain a new 115/14 kV substation on the East Eagle Street parcel ("East Eagle Substation" or "Substation") that would interconnect the New Lines with local distribution cables (Exh. EV-2, at 1-1R; RR-EFSB-34).

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[2] The Company's East Eagle Street parcel is located in the interior of a larger City of Boston-owned parcel ("City Parcel") at 338 East Eagle Street in East Boston (Exh. EV-2, at fig. 5-1; Tr. 12, at 1999-2000).

[3] In total, the New Lines are approximately 4.8 miles in length (RR-EFSB-54(S-1)(R-1)(1)).

Modifications to the existing Mystic and Chelsea Substations would also be required to connect the New Lines (together, the "Project") (Exhs. EV-2, at 3-7; EFSB-PA-8).[4]

The Company described its preferred route for each of the New Lines ("Primary Route") and also described an alternative route for which it provided notice to abutters and others ("Noticed Alternative Route"). Figure 1, below, shows the Primary Route and Noticed Alternative Route for the underground line from the Mystic Substation to the East Eagle Substation ("Mystic-East Eagle Line"); as well as the Primary Route and Noticed Alternative Route for the underground line from the East Eagle Substation to the Chelsea Substation ("East Eagle-Chelsea Line"). Figure 1 also highlights a section where both the Mystic-East Eagle Line and the East Eagle-Chelsea Line (both Primary and Noticed Alternative Routes) would occupy an existing duct bank crossing under Chelsea Creek ("Chelsea Creek Crossing"), and a section where the East Eagle-Chelsea Line on the Primary Route would use an existing underground duct bank along Eastern Avenue in Chelsea ("Eastern Avenue Duct Bank").[5]

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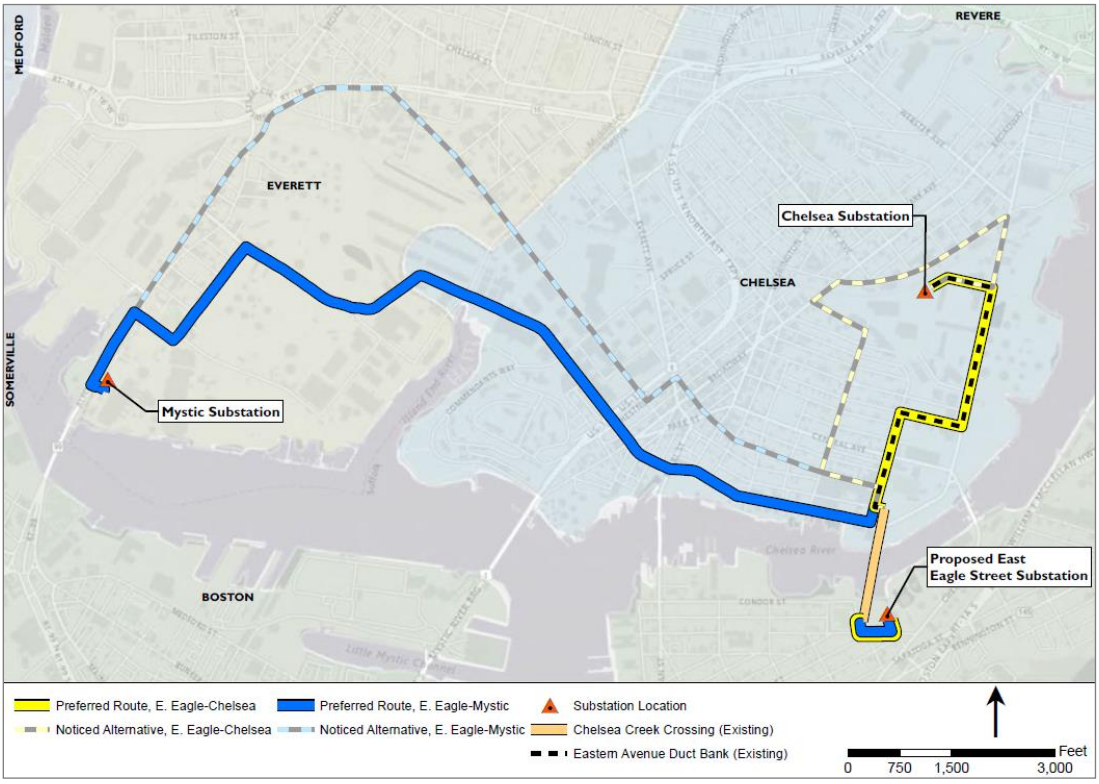
[4] In addition to the New Lines, Eversource would install approximately 1.5 miles of new distribution conduit containing 3.6 miles of new distribution feeders in association with the East Eagle Substation, but Eversource contends that such distribution lines are not jurisdictional (Exh. EV-2, at 1-1R; RR-EFSB-54(S-1)(R-1)(1)).

[5] According to the Company, approximately one-third (1.65 miles) of the proposed underground transmission lines would be installed within existing conduits (Exhs. EV-2, at 5-1 to 5-2; EFSB-G-11; EFSB-G-12).

Figure 1. Project Map



Source: RR-EFSB-67.

According to the Company, the Project is needed to improve the reliability and capacity of the electric system serving customers in East Boston, Winthrop, Chelsea, and Nahant, as well as portions of Revere, Lynn, Saugus, and Swampscott, including customers served by Eversource and by National Grid ("Chelsea/East Boston/Lynn Load Area") (Exh. EV-2, at 1-2R). Eversource estimated the cost of the Project at $129.9 million, including $70.1 million for the New Lines and modifications at the existing Mystic and Chelsea Substations, and $59.8 million for the new East Eagle Substation (RR-EFSB-54(S-1)(R-1)).[6]

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6 The Company stated that its cost estimate for the Project was "planning grade," with a target accuracy of minus 25 percent to plus 25 percent (RR-EFSB-54(S-1)(R-1)). The Company's cost estimate did not include the cost of in-street distribution feeder work associated with the Project, which the Company estimated at approximately $19.2 million, for a total cost of $149.1 million (id.)

B. Procedural History

On December 23, 2014, Eversource filed a petition with the Siting Board and two petitions with the Massachusetts Department of Public Utilities ("Department") relating to the Project. In the first petition, docketed as EFSB 14-4, the Company requested Siting Board approval of the Project pursuant to G.L. c. 164, § 69J ("Petition to Construct").[7] The second petition, docketed as D.P.U. 14-153, requested approval of the Project from the Department pursuant to G.L. c. 164, § 72 ("Section 72 Petition"). The third petition, docketed as D.P.U. 14-154, requested individual exemptions and a comprehensive exemption from the City of Boston Zoning Code pursuant to Section 6 of Chapter 665 of the Acts of 1956 ("Zoning Petition") (together, "Petitions").

On December 23, 2014, the Company filed a motion to consolidate the Petition to Construct, the Section 72 Petition, and the Zoning Petition for review and decision by the Siting Board. Pursuant to G.L. c. 164, § 69H(2), the Chairman of the Department on May 20, 2015, issued a Referral and Consolidation Order referring the Section 72 and Zoning Petitions to the Siting Board for review and decision with the Petition to Construct. The Siting Board accordingly conducted a single adjudicatory proceeding and developed a single evidentiary record with respect to the Petitions.

The Siting Board conducted a public hearing in the City of Chelsea on July 29, 2015, to receive public comments on the Project.[8] Pursuant to the Presiding Officer's instructions, a

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7 The document referred to in this Decision as the Petition to Construct is labelled by the Company as the "Analysis to Support Petitions before the Energy Facilities Siting Board" dated December 22, 2014. The Company filed both a public version (Exh. EV-2) and a confidential version (Exh. EV-2 (Confidential)). This decision references the public version of the Petition to Construct. On March 6, 2015, Eversource filed a revised Table of Contents for the Petition to Construct; on June 4, 2015, Eversource filed revised replacements to Sections 1, 2 and 3. References to revised sections of the Petition to Construct are indicated by the presence of an "R" after the cited page number. E.g., "Exh. EV-2.at 2-10R".

8 Commenters raised issues including the need for the Project; potential traffic impacts along truck routes in Chelsea during Project construction and post-construction repaving; limitations by the City of Boston on use of the East Boston parcel within which the

Spanish and Portuguese-speaking translator was present at the public hearing. In addition, the Company published the Notice of Public Hearing/Notice of Adjudication ("Notice") for the Project in English once a week for two consecutive weeks in the East Boston Times-Free Press, the Chelsea Record, and the Everett Independent. The Company also published the Notice in Spanish and in Portuguese once a week for two consecutive weeks in El Mundo and the Brazilian Times, respectively. The Company was required to place copies of the Notice and the Petitions in the Boston, Chelsea, and Everett City Clerk's offices and in a public library in each municipality.[9] On September 1, 2015, the Presiding Officer issued an intervention ruling granting intervenor status to two parties: the Channel Fish Company ("Channel Fish"); and Anne R. Jacobs, Trustee, Vernhunt Realty Trust ("Jacobs").[10] The ruling granted limited participant status to seven persons or entities: the 60-Employee Group;[11] the Chelsea Collaborative; four individual residents of East Boston; and an individual resident of Chelsea.

Siting Board staff and the parties conducted written pre-hearing discovery from September 2014 through October 2015. Siting Board staff issued two sets of discovery to the Company, one set to Channel Fish, and one set to Jacobs. The intervenors Channel Fish and Jacobs each issued one set of pre-hearing discovery to the Company, and the Company issued

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proposed substation would be sited; and availability of additional community meetings and information from the Company regarding the Project.

9 Siting Board review of the Project in this case was not subject to either the enhanced public participation or enhanced analysis provisions of the Commonwealth's Environmental Justice ("EJ") Policy. However, the Board required the Company to implement supplemental multi-language public notice and participation measures, based on a linguistic analysis of the communities in the Project area showing the presence of sizeable Spanish- and Portuguese-speaking populations in the communities. See also Section VI.B., below.

10 Ms. Jacobs, as Trustee of Vernhunt Realty Trust, is referred to in the Decision as "Jacobs." Evidence submitted by Ms. Jacobs is labelled either as "VRT" (e.g., Exh. EFSB-VRT-1) or as "Vernhunt" (e.g., Exh. Vernhunt-1).

11 The 60-Employee Group is comprised of 60 employees of the Channel Fish Company, represented collectively by one of the employees.

one set to Channel Fish. Siting Board staff conducted twelve days of evidentiary hearings, beginning on January 6, 2016 and ending on March 23, 2016. The Company presented the testimony of fourteen witnesses in support of its petitions: consultants Dr. Peter A. Valberg, Principal, Gradient; Kate McEneaney, Senior Planner, VHB/Vanasse Hangen Brustlin, Inc; Marc Bergeron, Senior Regulatory Specialist and Project Manager, VHB/Vanasse Hangen Brustlin, Inc; Michael Robert Sutton, P.E., VHB Incorporated; Stephen Carroll, Director, Real Estate, Suffolk Construction; and Frank Dubois, Project Manager, Burns and McDonnell Engineering; and Eversource witnesses Frances Berger, Manager, Sales and Revenue Forecasting Group; Michael W. O'Malley, Project Manager for the Mystic-East Eagle-Chelsea Reliability Project; John M. Zicko, Director of Substation and Overhead Transmission Line Engineering; Richard C. Zbikowski, Senior Planning Engineer, Transmission and Distribution Group; Robert Andrew, Director, System Planning, Eastern Massachusetts and New Hampshire; Kathleen J. Freeman, Director, Greater Boston Transmission Projects, Transmission Group; Michael Zylich, Permitting Specialist; and Kevin F. McCune, Supervisor, Licensing and Permitting, Environmental Affairs Department, Northeast Utilities.

Channel Fish presented the testimony of four witnesses: Louis Silvestro, owner and President, Channel Fish Company; Dr. Donald Haes, Radiation Safety Officer, BAE Systems, Inc.; Dr. Erik Peterson, Senior Principal, Safety and Risk Group, MMI Engineering, Inc.; and David Spako, P.E., Principal Electrical Engineer, Keystone Engineering, Inc. Jacobs presented the testimony of two witnesses: Anne R. Jacobs, Trustee, Vernhunt Realty Trust; and George J. Markos, owner of Yell-O-Grow Corporation.[12]

The parties filed initial briefs on May 20, 2016, and reply briefs on June 17, 2016. Subsequent to the filing of briefs, Channel Fish and the Company argued a number of evidentiary motions, pertaining primarily to the post-hearing introduction of evidence.

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[12] Five area businesses also submitted testimony on behalf of Jacobs, but did not participate in the evidentiary hearings: Lou Amaral, Director of Operations for C&W Services; Gitesh Patel, President of DG's Trading, Inc.; Glenn Messinger, General Manager of Baldor Boston, LLC; James Ruma, President of Ruma Fruit & Produce Co. Inc.; and Young Cho, Manager of Eagle Diner.

Subsequent to the close of evidentiary hearings and the filing of briefs, both Siting Board staff and Channel Fish conducted written discovery regarding Eversource's Project cost estimates. The discovery was triggered by the Company's post-hearing (February 24, 2017) response to a record request issued by Siting Board staff during hearings (RR-EFSB-54), in which Eversource was asked to provide a planning grade Project cost estimate. Information requests were issued by Siting Board staff on March 3, 2017 and April 14, 2017, and Channel Fish on April 11, 2017. The Company completed its responses to post-hearing cost discovery on June 20, 2017.

On June 30, 2017, Channel Fish filed a motion requesting an additional day of evidentiary hearings with respect to Project cost. On July 10, 2017, Eversource filed opposition to the motion. On July 28, 2017, the Presiding Officer issued a ruling denying Channel Fish's request for an additional day of hearings and establishing a schedule for supplemental briefing by the parties with respect to cost. The Company filed its initial brief on August 11, 2017; Channel Fish filed its initial brief on August 25, 2017. The Company filed its reply brief on September 1, 2017.

Siting Board staff prepared a Tentative Decision and distributed it to the Siting Board members and all parties for review and comment on November 8, 2017. The parties were given until November 17, 2017 to file written comments. The Siting Board received timely written comments from Eversource, Channel Fish, Ms. Gail Miller, Mr. Jesse Purvis, and GreenRoots. The Board conducted a public meeting to consider the Tentative Decision on November 30, 2017, at which the parties, limited participants, Boston Harbor Now, the Sierra Club, and GreenRoots presented oral comments. After deliberation, the Board directed staff to prepare a Final Decision approving the Petitions, subject to certain conditions set forth below.

C. 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 kV 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 kV or more and which is one mile or more in length on a new transmission corridor." The proposed 115 kV transmission line is 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 II, 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 III, 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 IV, 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 V, 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 VI, below).

II. NEED FOR THE PROPOSED FACILITIES

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. NSTAR Electric Company d/b/a Eversource Energy, EFSB 14-02/D.P.U. 14-73/14-74, at 7 (2017) ("Walpole-Holbrook"); NSTAR Electric Company d/b/a Eversource Energy, EFSB 15-03/D.P.U. 15-64/15-65, at 6 (2017) ("Mystic-Woburn"); New England Power Company d/b/a National Grid, EFSB 13-2/D.P.U. 13-151/13-152, at 6 (2014) ("Salem Cables"); New England Power Company d/b/a National Grid and Western Massachusetts Electric Company, 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. Walpole-Holbrook at 7; Mystic-Woburn at 7; 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. Walpole-Holbrook at 8; Mystic-Woburn at 7; Hampden County at 6.

B. Description of the Existing Transmission System

Three substations – Chelsea Substation, Lynn Substation, and Revere Substation – supply electricity to Eversource and National Grid customers in the Chelsea/East Boston/Lynn Load Area (Exh. EV-2, at 2-2R). According to the Company, Eversource's Chelsea Substation serves approximately 32,000 customers within Chelsea and East Boston (including Logan International Airport), while National Grid's Lynn and Revere Substations serve approximately 55,000 customers in Winthrop, Nahant, and parts of Revere, Lynn, Saugus, and Swampscott (id. at 1-2R, 1-7R). These three substations are connected to the rest of the New England electric grid by a National Grid-owned 115 kV transmission line extending south from Wakefield and an Eversource-owned 115 kV transmission line extending east from the Mystic Substation (id. at 2-2R). In the summer of 2013, demand for electricity within the Chelsea/East Boston/ Lynn Load Area peaked at 301 megawatts ("MW") (RR-EFSB-4).[13]

Two generating facilities are located within the Chelsea/East Boston/Lynn Load Area: the Wheelabrator Saugus generator (formerly RESCO) and a generator at the General Electric Lynn industrial facility ("GE Lynn"), which have installed capacities of approximately 44.5 megavolt-ampere ("MVA") and 30 MW, respectively (Exh. EFSB-PA-22). These two generating facilities connect directly to the National Grid 115 kV transmission line and, according to the Company, would be unable to operate in the event of an outage to this line (id.). The Company stated that both of these generators are basically self-scheduling; generation at each is scheduled primarily for on-site operational purposes rather than in response to signals

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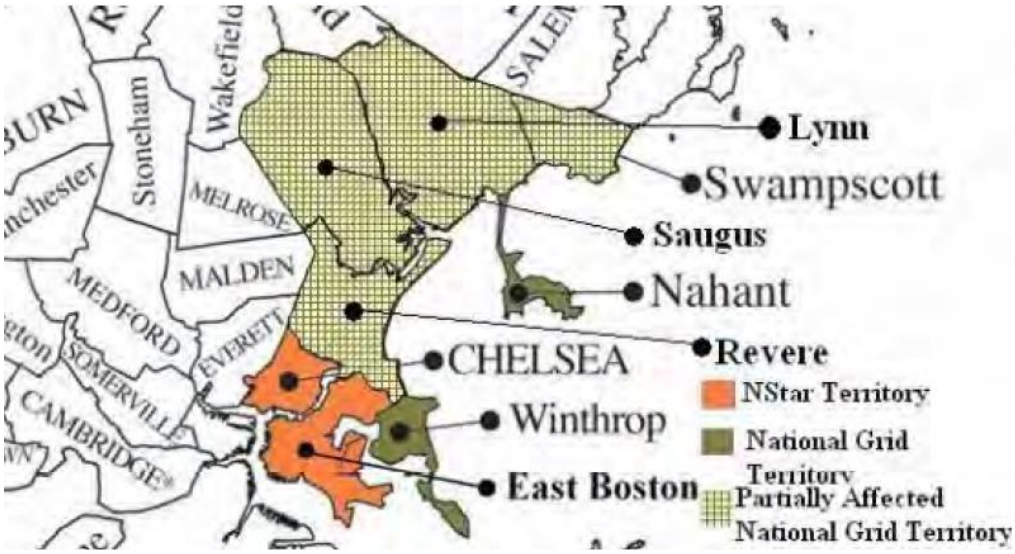
[13] Eversource indicated that the 301 MW peak demand for the Chelsea/East Boston/Lynn Load Area in 2013 is a "coincident peak" value; i.e., 301 MW was the area load at the time of the broader New England system peak for that year (RR-EFSB-4). Actual substation peak loads do not necessarily occur coincident with ISO-NE peaks (id.). The Company stated that local customer-owned generation (such as the GE Lynn generator) is not assumed to be available to help meet peak loads and was therefore excluded from the 2013 coincident load level (id.; Exh. EFSB-N-2; Tr. 1, at 40-41). According to the Company, ISO-NE uses historical and projected regional coincident peak load levels to plan the wider New England transmission system, whereas Eversource evaluates the capability of individual distribution substations to meet local area peak demand – which may occur at a different time than the system peak (RR-EFSB-4).

from the electricity market (Exh. EFSB-N-2; Tr. 10, at 1689). According to Eversource, the transmission system needs to be prepared to deliver up to 27.5 MW to GE Lynn, the full load of the industrial facility, in the event that the GE Lynn on-site generator is not operating (Exh. EFSB-N-2; Tr. 9, at 1582).

A map of the Chelsea/East Boston/Lynn Load Area is provided as Figure 2 below.

Figure 2. Map of the Chelsea/East Boston/Lynn Load Area



Source: Exh. EV-2, at 2-3R.

C. Description of the Company's Demonstration of Need

The Company presented two reasons it views the Project as needed: (1) the reliability of supply to the Chelsea/East Boston/Lynn Load Area, based on an assessment of the existing transmission system in Boston and the surrounding areas led by ISO-New England ("ISO-NE") (the Greater Boston Area Transmission Needs Assessment); and (2) the Company's own assessment of the capability of the Chelsea Substation to comply with Eversource's distribution substation planning criteria.

1. Greater Boston Area Transmission Needs Assessment

The Chelsea/East Boston/Lynn Load Area is located within the broader transmission region referred to as the "Greater Boston Area" (Exh. EV-2, at 2-10R). 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., app. 2-3, at 2).[14]

The Working Group reported the results of its initial assessment of the reliability needs of the Greater Boston Area in July 2010. A number of updates to this assessment were required to reflect significant changes on the transmission system (id.). The most recent needs assessment, the "Greater Boston Updated Transmission Needs Assessment" ("2015 Needs Assessment"), was issued in January 2015 (id. at 2-10R). This assessment evaluated the reliability 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., app. 2-3, at 2,3). The criteria established by these entities require transmission operators, such as Eversource, to design, test, and operate their systems so that equipment remains within acceptable thermal limits and voltage tolerances under various identified contingencies (id. at 2-5R to 2-8R). 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 2-8R). 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.). 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 (id. at 2-7R).

Additionally, as part of the 2015 Needs Assessment, the Working Group studied whether any N-1 or N-1-1 contingencies could result in consequential load loss approaching or exceeding

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[14] The Working Group defined the Greater Boston Area as including all of the Northeast Massachusetts load zone, and portions of the New Hampshire, Southeastern Massachusetts, and Western Central Massachusetts load zones (Exh. EV-2, app. 2-3, at 12).

300 MW (Exh. EV-2, app. 2-3, at 8).[15] While NERC reliability standards describe circumstances where load interruption is acceptable, the standards do not establish a limit for the amount of load that can be shed (Exh. EFSB-N-11(1) at 3). In 2010, ISO-NE representatives presented a Transmission System Planning Load Interruption Guideline ("Load Interruption Guideline") to provide policy guidance for when it would be acceptable to rely on load interruption to address an N-1-1 contingency (Exh. EFSB-N-11(1)). The Load Interruption Guideline states that consequential load interruption from N-1-1 contingencies is "allowed" when the load loss would be less than 100 MW, is "potentially allowable" for 100-300 MW of load, and is "not allowed" for loads exceeding 300 MW (id.). The Company stated that it treats this guideline as an effective planning standard establishing the minimum standard for load interruption with which the Company must comply (id.; Tr. 1, at 22-28).

For each of two study years (2018 and 2023), the 2015 Needs Assessment used the reliability criteria described above to evaluate 37 generation dispatch cases, which represent a range of possible generation dispatch and availability conditions (Exh. EV-2, app. 2-3, at 26). The 37 base cases assessed comprise "Design Cases," which include one or two major generating units out of service, and "Retirement Sensitivity Cases," which assume the retirement of the 1975-vintage Mystic 7 unit in addition to two major generating units being out of service (id., app. 2-3, at 27-29). 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., app. 2-3, at 27-28).

a. 2015 Needs Assessment 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-2, app. 2-3, at 19).

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[15] Examples of consequential load loss include radially supplied customer load and directly connected customer load that is interrupted directly as the result of a contingency.

Demand response ("DR") resources that had cleared Forward Capacity Auction 7 and energy efficiency ("EE") resources, as forecast in the 2013 CELT Report, were modeled as load reductions to establish the net demand for the Greater Boston Area for the study years (id., app. 2-3, at 19, 31-32; Exh. EFSB-N-1).[16] The CELT Report contains a ten-year econometric forecast that ISO-NE uses as a source of assumptions for all its electric planning and reliability studies (RR-EFSB-57). 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.), the average annual price of energy, and weather (id.).

According to the Company, the 2015 Needs Assessment load forecast predicted demand in the Chelsea/East Boston/Lynn Load Area would reach 324.9 MW by 2018, and grow to 332.9 MW by 2023 (Exh. EFSB-N-18). In response to questions from staff, Eversource provided information on any changes to the Chelsea/East Boston/Lynn Load Area load forecast that would result from use of the most recent ISO-NE demand forecast available at the time, as presented in the 2015 CELT Report (RR-EFSB-3). A summary of the peak demand, DR and PV resources, and EE forecast for the Chelsea/East Boston/Lynn Load Area based on the 2015 CELT Report is provided in Table 1, below.[17]

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16 The Company stated that projected future growth in solar photovoltaic ("solar PV") resources was not considered in the development of the 2015 Needs Assessment demand forecast because at the time of development a solar PV forecast was not yet available (Exh. EFSB-N-20). In response to questions from staff, Eversource stated that the 2015 CELT Report estimated an effective contribution of two MW from solar PV resources within the Chelsea/East Boston/Lynn Load Area by 2023 (id.).

17 The Company stated that the 2015 Needs Assessment assumed 31 MW of customer load at GE Lynn; however, based on discussions with National Grid (the Company responsible for supplying the General Electric industrial load in Lynn), Eversource stated that it would be more appropriate to assume a peak load of 27.5 MW for this customer (Tr. 9, at 1581-1582, 1601). Accordingly, load values presented in Table 1 have been adjusted to reflect a 27.5 MW load level at GE Lynn.

Table 1. Electrical Demand in the Chelsea/East Boston/Lynn Load Area Based on the 2015 CELT Report

	Chelsea/East Boston/Lynn Load Area	
	2018 (MW)	**2023 (MW)**
Demand at System Peak	332.5	366.7
Demand Response and Solar PV	-29.1	-29.8
Energy Efficiency	N/A	-13.9
Net Demand	**303.4**	**323.0**

Note: For the year 2018, the 2015 CELT Report peak demand is already net of energy efficiency resources and therefore separate energy efficiency values are not provided in Table 1.

Sources: Tr. 9, at 1585, 1600-1601; RR-EFSB-3; RR-EFSB-59.

In response to further questions from staff about the accuracy of the ISO-NE forecast, Eversource provided information on the actual and the 90/10 weather-adjusted historical peak demand in the Chelsea/East Boston/Lynn Load Area for comparison with forecast 2018 and 2023 load levels (RR-EFSB-4; RR-EFSB-5).[18,19] Table 2, below, provides a summary of the actual and 90/10 weather adjusted summer peak demand levels in the Chelsea/East Boston/Lynn Load Area between 2005 and 2015, assuming full customer load (27.5 MW) at the GE Lynn industrial facility.

[18] 90/10 weather is the extremity of weather anticipated once every ten years.

[19] Weather adjusted loads are the Company's estimate of what actual peak load would have been if there had been 90/10 weather.

Table 2. Chelsea/East Boston/Lynn Load Area Historical Coincident Peak Demand and Weather Adjusted Demand as Presented by the Company

Year	Actual Summer Coincident Peak Load (MW)	90/10 Weather Adjusted Summer Coincident Peak Load (MW)
2005	269.3	276.4
2006	278.5	277.9
2007	232.8	245.6
2008	235.6	251.0
2009	272.1	292.7
2010	279.8	289.5
2011	297.4	298.6
2012	286.4	300.9
2013	301.0	303.4
2014	265.5	285.3
2015	248.4	265.8

Source: RR-EFSB-5.

The weather-adjusted load levels presented in Table 2 were established using Eversource's weather normalization methodology for its territory, and provided by National Grid to Eversource for National Grid territory (RR-EFSB-5). Eversource evaluated historical data for each of its operating companies to determine the relationship between actual weather conditions and load, deriving weather coefficients representing the effect of weather on load (id.). Weather variables used in this analysis included heating degree days for the winter months and temperature and humidity indices ("THI") for the summer months (id.).[20] The Company stated that the analysis produced weather coefficients for both winter and summer months, and that the weather impact for any historical year was calculated by multiplying the weather coefficient by the difference between the expected 50/50 weather conditions and the actual weather (id.).[21]

The Company indicated that its weather normalization process is its best estimate of the impact of weather conditions on area load, but that the calculation is inexact (RR-EFSB-5). The

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[20] Predicted 90/10 summer extreme weather conditions have a THI of 85.5 (RR-EFSB-4).

[21] The Company stated that 50/50 weather conditions are defined as an average of the weather conditions that were observed on the annual peak load days of the past ten years (RR-EFSB-5).

Company stated that Chelsea/East Boston/Lynn Load Area experienced two years with weather conditions very close to the 90/10 level during the 2005 to 2015 period – the years 2011 and 2013 – and that during those years peak demand in the area was just under or just over 300 MW (id.; Exh. EFSB-N-22(R-1); Tr. 1, at 62; RR-EFSB-4). Thus, the Company argued that there is historical evidence that its 300 MW load estimate is a reasonably good representation of 90/10 demand in the Chelsea/East Boston/Lynn Load Area (RR-EFSB-4). The Company opined that the decrease in load recorded in 2014 and 2015 was not due to sustained economic contraction, or any other variable that would persist over time, but rather was due to unusually cool weather experienced during 2014 and 2015, as well as an unusual load occurrence (i.e., the 2015 peak day occurring in September rather than in August as is typically the case) (id.; Tr. 1, at 122-123). Eversource asserted that factoring in future economic growth, known large customer connection requests, and recent peak load levels in the Chelsea/East Boston/Lynn Load Area under approximately 90/10 weather conditions, it is reasonable to assume that the area will reach the forecasted peak load level of greater than 300 MW by 2018 (RR-EFSB-60).

b. 2015 Needs Assessment Chelsea/East Boston/Lynn Load Area Reliability Needs

Eversource stated that, based on the reliability and planning standards and criteria described above, the 2015 Needs Assessment determined that the existing transmission system serving the Chelsea/East Boston/Lynn Load Area is insufficient to maintain a reliable supply of electricity to customers (Exh. EV-2, at 2-13R, 2-15R). Specifically, the Company identified load interruption and low voltage criteria violations following certain contingencies of concern (id. at 2-13R).

The 2015 Needs Assessment found that over 300 MW of load in the Chelsea/East Boston/Lynn Load Area cannot be served in the event of a contingency involving the sequential loss of two area transmission lines (id. at 2-10R; Exh. EFSB-N-12). Eversource stated that such an N-1-1 contingency occurring under peak demand conditions would drop approximately 303 MW of load in the Chelsea/East Boston/Lynn Load Area by 2018, and 323 MW by 2023, based on the 2015 CELT Report (Tr. 9, at 1600-1601; RR-EFSB-3). The Company further indicated that following the N-1-1 contingency of concern distributed generation ("DG")

resources in the Chelsea/East Boston/Lynn Load Area would trip off-line, increasing the amount of load interrupted in the Chelsea/East Boston/Lynn Load Area (Tr. 1, at 45; RR-EFSB-3). The Company stated that this amount of consequential load loss is in excess of the 300 MW criterion established by ISO-NE in its Load Interruption Guideline, and that action is required to limit the amount of load at risk of interruption following the contingency of concern (Exh. EV-2, at 2-15R).[22]

Additionally, Eversource stated that the 2015 Needs Assessment identified numerous low voltage violations in the Chelsea/East Boston/Lynn Load Area following certain N-1 and N-1-1 contingencies (Exh. EV-2, at 2-13R). According to the Company, relocation of the existing 115 kV capacitor bank within the Chelsea Substation (work planned outside of the scope of the Project) would address some, but not all, of these low voltage violations (id. at 3-1R).

Eversource stated that the Project would resolve the potential for an N-1-1 interruption of supply to customers in the Chelsea/East Boston/Lynn Load Area, and would also resolve all of the remaining low-voltage criteria violations (id. at 3-3R). Furthermore, Eversource argued that construction of the Project was recommended by ISO-NE in its 2015 Greater Boston Area Transmission Solutions Study ("Solutions Study") (id. at 2-10R; RR-EFSB-17(1)). Specifically, the Solutions Study selected a new 115 kV transmission line between the Mystic and Chelsea Substations to address the potential for greater than 300 MW of load interruption in the Chelsea/East Boston/Lynn Load Area (Exhs. EV-2, app. 2-5 (Confidential) at 65, 72, 108; EFSB-PA-23). Eversource stated that during the development of the Solutions Study, the

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22 The Company stated that National Grid has the potential to restore power to approximately 40 to 45 MW of customers in the Chelsea/East Boston/Lynn Load Area following the N-1-1 contingency of concern using manual distribution switching (Exh. EFSB-N-13). According to the Company, this manual switching would take approximately six hours to complete and would therefore be insufficient to comply with the Load Interruption Guidelines (id.; Tr. 1, at 75). The Company also identified planned National Grid distribution projects involving automatic transfer schemes and new distribution feeder ties that would provide additional modest post-contingency relief (Exh. EFSB-N-17). The Company indicated that these projects are not expected to be completed until 2020, and that the system would still not be in compliance with the Load Interruption Guidelines following their implementation (id.; Tr. 1, at 75).

Company made ISO-NE aware of the proposed East Eagle Substation and the Company's plans to address additional distribution needs within the load pocket (see Section II.C.2.b, below) (Exh. EFSB-PA-23). ISO-NE subsequently confirmed that the proposed Project (including the New Lines and East Eagle Substation) was identified as the lowest cost solution for addressing both the transmission and distribution system needs of the Chelsea/East Boston/Lynn Load Area, and was therefore included in its Solutions Study models, as well as in its ongoing studies for Greater Boston Proposed Plan Applications approval (RR-EFSB-17(1)).

2. Company Distribution Substation Capability Assessment

Similar to the reliability and planning standards and criteria set forth by NERC, NPCC, and ISO-NE, the Company has established planning criteria applicable to its distribution substations (Exh. EV-2, at 2-11R). Eversource's Bulk Distribution Substation Assessment Procedure, SYS PLAN-010, outlines the criteria and methods the Company uses to assess the capability of its bulk substation and distribution facilities (id.). SYS PLAN-010 states that Eversource must develop plans to ensure that: (1) each electrical distribution bus has at least two available means of supply (primary and secondary); (2) upon loss of one supply source, customer electric service is automatically restored; and (3) the number of bulk distribution power buses with no power source as a result of a single transmission system contingency is limited (id.). Additionally, SYS PLAN-010 states that, under normal operating conditions and configurations ("N-0"), substation transformer loads should not exceed 75 percent of their normal rating, and that following an N-1 contingency involving the loss of a bulk substation transformer, substation transformer loads should not exceed their LTE rating (id.).

a. Company Load Forecast Methodology for Chelsea Substation

The Company developed an independent forecast of local peak electricity demand for the purposes of testing and evaluating the capacity of its Chelsea Substation within the Chelsea/East Boston/Lynn Load Area (Exh. EV-2, at 2-11R to 2-12R). Eversource stated that it developed this forecast by regressing historical peak demand data for its local distribution company, the Boston Edison Company, against regional historical economic data provided by Moody's

Analytics, Inc. and THI values compiled by Eversource (id.; Tr. 1, at 95-96; RR-EFSB-9).[23] Eversource stated that once the peak demand forecast was established, the Company then made adjustments to reflect forecasted contributions from projected incremental EE and DG resources for the operating region (a total reduction of 5.1 MVA in 2018, growing to 10 MVA in 2024) (Exhs. EV-2, at 2-12R; EFSB-N-5).[24] Adjustments were also made to reflect any significant (multiple MVA) new customer connection requests that had been received by the Company (referred to as "step loads") that had not already been accounted for as part of normal growth (Tr. 1, at 17-19; Tr. 10 at 1643-1644; RR-EFSB-9). According to the Company, four such step load customers have requested electrical service from Eversource by 2018 in the area served by the Chelsea Substation (Exh. EV-2, at 2-14R; RR-EFSB-5). These customers include a new residential development and a new Federal Bureau of Investigation building in Chelsea (totaling approximately 5.6 MVA), along with two new residential developments in East Boston (totaling approximately 6.4 MVA) (Exh. EV-2, at 2-14R). Using this forecasting methodology, Eversource determined that peak electricity demand at the Chelsea Substation under 90/10 weather conditions would be 143 MVA in 2016, growing to 149.9 MVA in 2024 (Exh. EFSB-N-5).

While different methodologies were used by ISO-NE and the Company to prepare the Chelsea/East Boston/Lynn Load Area and Chelsea Substation peak demand forecasts, respectively, the Company stated that a comparison between the Company's predicted 2018 and 2023 net load levels at the Chelsea Substation and the load forecast used by ISO-NE for the

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23 With regard to THI values compiled by the Company, Eversource stated that it compiled historical THI and temperature data for each of its operating regions, and based on the 90th percentile of historical THI or temperature data, calculated regional 90/10 weather conditions (Exh. EV-2, at 2-12R). Eversource then used this information in forecasting equations for the Company's peak demand forecast (id.).

24 The Company asserted that because DG facilities in the area are typically small, behind-the-meter generators, further modifications to the forecast to account for existing DG resources were not required; rather, the contributions of these resources were inherently reflected within the peak demand forecast (Exh. EV-2, at 2-12R).

Chelsea Substation showed reasonably close alignment (Tr. 9, at 1599-1600; RR-EFSB-14).[25] The Company further indicated that its load forecasting approach is consistent with ISO-NE practices (Exh. EV-2, at 2-12R).

In response to questions from staff, Eversource provided information on the actual and the 90/10 weather-adjusted historical peak demand at the Chelsea Substation for comparison with forecast demand at the Substation (Exhs. EFSB-N-4; EFSB-N-22(R-1); Tr. 1, at 120-124; RR-EFSB-9). Table 3, below, provides a summary of the actual summer peak demand levels observed at the Chelsea Substation between 2008 and 2015, with the peak-day weather conditions, and the weather-adjusted historical peak load levels.[26]

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25 Eversource indicated that, after adjusting the ISO-NE forecast to remove allocations of system-level resources (e.g., demand response), there is an approximately 6 MW difference between the Company's forecast and the ISO-NE 2015 Needs Assessment demand forecast in 2018, and a 0.33 MW difference in 2023 (RR-EFSB-14).

26 In response to questions from staff and intervenors, Eversource provided information on the accuracy of its Chelsea Substation load forecast over the 2008 to 2015 period (Exh. CF-EV-44; RR-EFSB-6). According to the Company, forecasts for the Chelsea Substation were generally within plus or minus five percent of the weather-adjusted actuals, with the exception of the years 2009 and 2015, when the Company's forecast deviated as much as twelve percent from the weather-adjusted actual demand due to unusual weather conditions experienced in those years (RR-EFSB-6).

Table 3. Chelsea Substation Historical Peak Demand and Weather Conditions as Presented by the Company

Year	Actual Summer Peak Load (MVA)	90/10 Weather-Adjusted Summer Peak Load (MVA)	Actual Peak Day Temperature	Actual Peak Day THI
2008	92.8	94.1	83	77
2009	116.9	123.6	91	82
2010	120.5	123.7	90	81
2011	123.3	123.5	98	85
2012	119.3	123.9	96	83
2013	123.7	124.7	98	85
2014	117.1	124.5	91	82
2015	111.7	119.1	90	80

Sources: Exh. EFSB-N-22(R-1); RR-EFSB-6.

Eversource asserted that due to unusual weather conditions in 2015 and the difficulties associated with providing 90/10 weather-adjusted loads at a substation level, their estimated weather-adjusted peak demand at the Chelsea Substation was understated for 2015 (RR-EFSB-5; RR-EFSB-6). Instead, the Company stated that it is reasonable to assume that a peak demand similar to that observed at the Chelsea Substation in 2013, when actual weather conditions were slightly less severe than 90/10 conditions, will be reached again in the future (RR-EFSB-5; RR-EFSB-6).[27] Accordingly, the Company argued that it must plan for such an eventuality (RR-EFSB-5; RR-EFSB-6).

b. Chelsea Substation Capacity Need

Eversource stated that, due to increasing summer peak demand, the existing supply of electricity to the area served by the Chelsea Substation is inadequate (Exh. EV-2, at 2-14R; Tr. 1, at 105-109). The Company stated that in 2013, under N-0 conditions, peak demand exceeded 75 percent of the Chelsea Substation's normal rating, in violation of its SYS PLAN-010

[27] The Company's selection of 2013 as its base forecast year also excludes 2014 data, when actual weather conditions were warmer than 2015, but still less severe than 90/10 conditions (Exh. EFSB-N-22(R-1); RR-EFSB-6). The Siting Board notes that the Company's weather adjusted loads for 2013 and 2014 are nearly identical.

requirements (Exhs. EV-2, at 2-15R; EFSB-N-8).[28] The Company also stated recent requests for electrical service from four large step loads in the area served by the Chelsea Substation demonstrate continued growth in demand, such that, under 2016 peak load conditions, the area demand for electricity would create overloads under post-contingency conditions at the Chelsea Substation (Exhs. EV-2, at 2-14R; EFSB-N-9). Specifically, the Company stated that an N-1 contingency involving the loss of one of the transformers at the Chelsea Substation would result in post-contingency transformer loads in excess of the substation's 135 MVA LTE rating during peak load conditions (Exh. EV-2, at 2-2R, 2-14R).[29] The Company indicated that the system configuration does not allow transfer of any customers supplied by the Chelsea Substation to a neighboring substation following a contingency to address such an overload (Exh. EFSB-N-10; Tr. 1, at 108-109). The Company forecasted that by summer 2016 the Chelsea Substation 135 MVA LTE rating would be exceeded by 8 MVA following an N-1 contingency, increasing to an exceedance of 14.9 MVA by summer 2024 (Exh. EV-2, at 2-14R). In such an event, at least 8 MVA/14.9 MVA of local load would be dropped to preserve substation equipment (id.; Tr. 2, at 275).

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[28] The Company stated that in accordance with SYS PLAN-010, the normal rating of a substation is assessed at the transformer level, rather than the total substation level (Exhs. EV-2, at 2-11R; EFSB-N-8). According to the Company, demand on the Chelsea Substation Transformer 110C exceeded 75 percent of its normal rating of 46.9 MVA on July 19, 2013, when demand on the transformer reached 47.4 MVA (Exh. EFSB-N-8). Channel Fish argues that not all of the transformers exceeded 75 percent of their normal ratings and therefore the total Chelsea Substation meets criteria (CF Reply Brief at 24-25). In response, the Company reiterates that the standard applies at the transformer level (Company Reply Brief at 8).

[29] Following loss of a transformer at the Chelsea Substation, load at the Substation would be automatically supplied by two (rather than three) of the Chelsea Substation transformers through the action of an automatic bus restoral (ABR) scheme (Exh. EV-2, at 2-14R; Tr. 1, at 110-111). The Company stated that the resulting thermal loading on the remaining transformers would cause LTE violations under peak demand conditions (Exh. EV-2, at 2-14R).

D. Positions of the Parties

1. Channel Fish

Channel Fish argues that Eversource failed to demonstrate a need for the additional distribution capacity that the proposed East Eagle Substation would provide (i.e., the Company's second need argument; see Section II.C.2, above) (CF Brief at 1).[30] Specifically, Channel Fish argues that electrical demand at the Chelsea Substation has already peaked – at 122.5 MW in 2013 – and that demand has since (by 2015) fallen by over 13 MW (id. at 15-16, citing EFSB-N-2).[31] Channel Fish rejects the Company's position that the recent decline is explained by unusually cool summer weather for two reasons: (1) according to Channel Fish, Eversource itself stated that "a number of factors" besides weather caused the decline, including advances in EE and changes in customer usage; and (2) in Channel Fish's opinion, weather alone would not explain the large year-over-year decline that occurred in 2014 (CF Brief at 16, citing Tr. 10, at 1642; EFSB-RR-4; RR-EFSB-7). Channel Fish argues that Eversource has not convincingly demonstrated that these decreases in demand are only temporary in nature (CF Brief at 16). Channel Fish further asserts, referencing ISO-NE's demand forecast, that electrical demand at the Chelsea Substation will not exceed the substation's LTE rating at any point within the forecast period through 2023 and that, as such, ISO-NE did not identify the proposed East Eagle Substation as a necessary system improvement (CF Brief at 16-17; CF Reply Brief at 22-23; citing Exhs. EFSB-N-18; EFSB-N-19; CF-1;[32] RR-EFSB-2; RR-EFSB-7). Moreover, Channel

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30 Jacobs indicates support for the positions taken by Channel Fish and specifically adopts the arguments made by Channel Fish with respect to Eversource's failure to meet the requirements of G.L. c. 164, §69J (Jacobs Reply Brief at 2).

31 Based on the numbers provided by Channel Fish, it appears that Channel Fish is using the system coincident peak demand at the Chelsea Substation forecast by ISO-NE as the basis for its arguments, rather than the local substation peak demand forecast by the Company, and as such the values are not strictly comparable. See Table 3.

32 Channel Fish used the same naming convention for the Information Requests it issued to Eversource (Exhs. CF-1 through CF-56) and the 24 exhibits that it offered into evidence during the proceeding (CF-1 through CF-24). To distinguish these two types of exhibits, Channel Fish's Information Requests to Eversource, and Eversource's responses to them,

Fish argues that Eversource's load forecasting methodology may "double count" some new load as, first, part of underlying modeled economic growth and, second, again in identified step load additions (CF Brief at 19-20, citing Tr. 10, at 1651-1652; RR-EFSB-5). Finally, Channel Fish argues that Eversource's load forecasting methodology is "inaccurate by design" due to the use of a 90/10 weather assumption, which recognizes that actual peak demand will not meet the forecast in nine out of ten years (CF Brief at 19). Based on the foregoing, Channel Fish questions the accuracy and reliability of Eversource's load forecasting model, and submits that the Siting Board should find Eversource's load projection unreliable (id. at 18-21).

2. Company Response

Eversource argues that it has used reasonable system planning criteria to determine that new substation capacity is needed, and that the Company has relied on SYS PLAN-010 to establish the need for several other projects recently approved by the Department (Company Reply Brief at 3-5, citing NSTAR Electric Company, D.P.U. 15-02, at 8 (2015) (Hopkinton); NSTAR Electric Company, D.P.U. 14-03, at 8 (2015); NSTAR Electric Company, D.P.U. 13-177/178, at 13, n.9 (2015) (NSTAR Seafood Way); NSTAR Electric Company, D.P.U. 13-64, at 8 (2014); NSTAR Electric Company, D.P.U. 13-126/13-127 (2014)). Eversource reiterates that in July 2013, load on Chelsea Substation Transformer 110C exceeded 75 percent of the transformer's normal rating, exceeding SYS PLAN-010 limits, and that it expects demand at the Chelsea Substation to exceed the substation's LTE rating in the future due to anticipated load growth (Company Reply Brief at 8-11). Eversource argues that, contrary to Channel Fish's assertions, its forecast in this proceeding is reviewable, reliable, and appropriate (id. at 5, 10-14, citing Tr. 10, at 1634, 1638, 1641, 1644-1647, 1651; RR-EFSB-4; RR-EFSB-5; RR-EFSB-6; RR-EFSB-7; RR-EFSB-9; RR-EFSB-60).

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are cited to in this Decision as "CF-EV-1," "CF-EV-2," etc. Exhibits offered into evidence by Channel Fish remain labelled as "CF-1," "CF-2," etc.

E. Analysis and Findings on Need

In the 2015 Needs Assessment, the Working Group assessed the transmission system serving the Greater Boston Area for compliance with planning standards and criteria established by NERC, NPCC, and ISO-NE. The Working Group identified the potential for consequential load loss in excess of 300 MW in the Chelsea/East Boston/Lynn Load Area by 2018 following an N-1-1 contingency, as well as the potential for post-contingency low voltage violations in the area following certain N-1 and N-1-1 contingencies of concern. These represent significant reliability risks. The Siting Board recognizes the responsibilities and expertise of ISO-NE, and accords considerable weight to the 2015 Needs Assessment and its findings. Furthermore, the 2015 Needs Assessment and the Company's arguments regarding the Chelsea/East Boston/Lynn Load Area regional need are uncontested in this case. The Siting Board finds that the Company's use of N-1 and N-1-1 planning criterion is reasonable and appropriate, and that Eversource's existing transmission system in the Chelsea/East Boston/Lynn Load Area does not meet these criteria. See also Walpole-Holbrook at 8-17, and Mystic-Woburn at 8-18.

Eversource's own reliability assessment of the Chelsea Substation follows the Company's SYS PLAN-010, which prescribes substation reliability planning standards and criteria that the Siting Board has previously found to be reasonable and appropriate.[33] Eversource's assessment demonstrated that, in 2013, actual peak demand at the Chelsea Substation exceeded the Company's planning standards for acceptable substation pre-contingency thermal ratings (which is assessed at the individual transformer level) and that, by 2016, under forecast summer peak demand conditions, at least 8 MVA of load would be at risk of interruption following a contingency at the Chelsea Substation. The amount of load at risk of interruption would increase to at least 14.9 MVA by 2024. The Siting Board finds that

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[33] Transmission owners are responsible for assessing the capability of their local substations to meet customer demand, and as such an assessment of the capacity of the Chelsea Substation was not within the scope of the 2015 Needs Assessment, nor was a solution to add additional substation capacity in East Boston (e.g., the East Eagle Substation) specifically recommended by ISO-NE in the 2015 Solutions Study.

the Company's use of its SYS PLAN-010 standards is reasonable and appropriate, and that the existing Chelsea Substation does not meet Company standards.

The Company's assessment of need relied on two different demand forecasts. The first was used to establish demand in the Chelsea/East Boston/Lynn Load Area, and was adopted by the Company from ISO-NE's 2015 Needs Assessment. The second load forecast was used to establish the local summer peak demand for electricity at the Chelsea Substation, and was developed by the Company. Channel Fish takes issue with the Company's load forecasting method at the substation level, and contends that the Company's forecast is unreliable. For the reasons discussed below, the Siting Board concludes that Channel Fish's arguments are unpersuasive, and that the Company's Chelsea Substation forecast is appropriate for use in this proceeding.

In its arguments, Channel Fish relies on the ISO-NE 2015 Needs Assessment for Chelsea Substation peak load information. The record shows that the 2015 Needs Assessment was designed to assess the reliability of electrical supply to the broad Greater Boston Area. Channel Fish's reliance on the ISO-NE forecast is inapposite because the ISO-NE forecast was based on system-wide coincident peak data and an allocation of system-level resources appropriate to the study of a broader geographic region. The Company's Chelsea Substation forecast reflects local non-coincident peak demand, which is the more relevant level that an individual substation must be capable of supplying to ensure reliable service. Whether ISO-NE's 2015 Needs Assessment shows demand at the Chelsea Substation exceeding the Substation's 135 MVA LTE is not a determinative test. Rather, a substation-specific assessment is more relevant, and was appropriately undertaken by the Company.

With respect to Channel Fish's argument that electrical demand at the Chelsea Substation has already peaked, the record shows that yearly peak loads occur under a variety of conditions, and that the peak load in 2015 was unusual due to its occurrence in September. Furthermore, in any particular year, neither actual peak loads nor weather-adjusted peak loads will exactly match forecast loads. The Siting Board accepts that peak loads under unusual circumstances can have low predictive value (e.g., inaccurately characterizing trends). Therefore, contrary to Channel Fish's assertions, the apparent decline in load from 2013 to 2015 cannot be relied upon to

demonstrate a real decline in underlying demand in the Chelsea area. Excepting the 2015 data, the record shows that weather-adjusted demand at the Chelsea Substation has been steady or slightly increasing since 2009.

With respect to Channel Fish's objection to the use of a 90/10 weather assumption for the forecast, New England utilities have used 90/10 weather assumptions as the basis for transmission system planning for many years, use of 90/10 weather contributes to reliability under stressed conditions, and the Siting Board has accepted forecasts prepared on this basis.

Finally, Channel Fish argues that four step loads identified by the Company (totaling approximately 12 MVA) are double-counted in the Substation demand forecast on the basis that these increases are simultaneously considered by Eversource as individual additions and by Moody's Analytics generically in the underlying economic forecast. The record shows that the step load additions by 2018 are larger than the predicted underlying growth in electrical demand at the Chelsea Substation in the same years, and therefore the Siting Board concludes that the step load increases are not double-counted.

Incorporating non-coincident peak demand, 90/10 weather assumptions, and four step loads, and excluding the apparent outlier of the actual 2015 peak demand, the Company projected peak demand at the Chelsea Substation of 143 MVA in 2016, which exceeds the capacity of the substation (135 MVA). The Siting Board notes that 2013 weather-adjusted peak demand at the Chelsea Substation (approximately 125 MVA), plus the known step loads (12 MVA), but excluding any other load growth, would still result in a total peak load in excess of the Chelsea Substation capacity.

Overall, the Company has provided sufficient information to permit a general understanding of the two forecasting methods used, and the Siting Board finds that the Company's forecasts are reviewable, appropriate, and reliable for use in this proceeding to evaluate the Company's assertion of need.

The Siting Board concludes that, for the Chelsea/East Boston/Lynn Load Area, there is a risk of: (1) an excessive amount (over 300 MW) of consequential load loss; and (2) inadequate post-contingency voltage performance. The Siting Board further concludes that the Chelsea Substation: (3) has pre- and post-contingency capacity constraints; and (4) poses an increasing

risk of post-contingency load shedding beginning in 2016. On the basis of both an identified regional need and an identified substation-specific need, the Siting Board finds that additional energy resources are needed to maintain a reliable supply of electricity in the Chelsea/ East Boston/Lynn Load Area.

III. 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.[34] 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. Mystic-Woburn at 18; Salem Cables at 17-18; NSTAR Electric Company, EFSB 10-2/D.P.U. 10-131/10-132, at 29 (2012) ("Lower SEMA").

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 alternatives combining substation and transmission investments ("transmission alternatives").[35]

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[34] G.L. c. 164, § 69J also requires an applicant to present "other site locations." This requirement is discussed in Section IV, Route Selection, below.

[35] Eversource also evaluated a no-build approach. However, this approach did not address the identified reliability need (Exh. EV-2, at 3-1R to 3-2R).

1. Non-Transmission Alternatives

With regard to the identified regional need, Eversource stated that DG, DR, and EE would not be effective solutions for the contingencies of concern (Exhs. EV-2, at 3-15R; EFSB-PA-15(R-1)). Eversource stated that following one of the identified N-1-1 contingencies, customers located within the Chelsea/East Boston/Lynn Load Area would be wholly disconnected from the transmission system (Exh. EFSB-PA-15(R-1)). Eversource stated that such an event would cause DG resources to trip offline in compliance with standards set by the Institute of Electrical and Electronics Engineers ("IEEE"), and therefore DG resources would be unable to support customer load (id.). Similarly, the Company stated that EE and DR do not provide energy to customers in the absence of any other source of electrical supply (id.). Furthermore, the Company stated that maintaining adequate voltages in the Chelsea/East Boston/Lynn Load Area following an N-1-1 contingency would require a load reduction of approximately 74 MW (about 23 percent of total area load), which according to Eversource is too great an amount to achieve from DG, EE, and DR, based on the Company's actual recent experiences with locationally targeted demand reduction programs (id.). Accordingly, the Company removed these options from further consideration.

The Company also considered the development of large-scale generation to address the identified load interruption and low voltage needs (Exh. EV-2, at 3-17R to 3-18R). According to the Company, over 300 MW of quick-start generation connected to the 115 kV transmission system in the Chelsea/East Boston/Lynn Load Area would be required, and in order to address the identified need, such generation (in the absence of black-start capability) would have to operate continuously after an initial transmission line outage (regardless of economic merit) in order to be instantaneously available after a second outage (id.). Eversource identified significant concerns with the reliability and feasibility of such an option, including issues with frequency control within what would then be an isolated load area; Eversource also anticipated difficulties finding a site for such generation (id.; Tr. 1, at 148). Based on these considerations, as well as an estimated engineering, procurement, and construction cost of over $300 million for the generation facility, the Company removed this option from further consideration (Exhs. EV-2, at 3-18R; EFSB-PA-21).

Considering only the identified Chelsea Substation need, the Company considered the potential for increasing DG, EE, DR, and energy storage and determined that 11.8 MW of net load reduction in 2019, and 14.9 MW in 2024, would be required to meet the identified local capacity need (Exh. EFSB-PA-17). According to the Company, approximately 45 MW (3.8 times the necessary net load reduction) of solar PV resources connected to the Chelsea Substation would be required during the typical 4:00 p.m. to 6:00 p.m. peak period by 2019, increasing to approximately 57 MW by 2024, in order to address the local N-1 capacity shortfall (id.).[36,37] The Company estimated a need for approximately 10 to 15 MW of incremental EE reductions to address the identified N-0 and N-1 capacity needs at the Chelsea Substation – a roughly 11 percent reduction in peak demand at the substation (id.; RR-EFSB-11).[38] As with the regional need, the Company stated that DG or EE development of this magnitude would be unachievable in such a small geographic area, and is therefore not a feasible alternative to the Project (Exhs. EV-2, at 3-15R; EFSB-PA-17; RR-EFSB-10; RR-EFSB-11). Eversource also stated that because DR resources are dispatched by ISO-NE on a load zone basis, ISO-NE does not have a system for dispatching DR in response to the specific needs of the Chelsea Substation, and therefore DR resources cannot be targeted to address the identified capacity need (Tr. 1, at 129-131).

Finally, the Company indicated that it had evaluated a 12 MVA, 72-megawatt-hour battery storage system (Exh. EV-2, at 3-16R). Eversource estimated that such a system would

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36 Approximately 39 MW of solar PV would be required to address the identified N-0 issues (RR-EFSB-11).

37 The Company indicated that the hourly output of solar PV does not align well with hourly electrical demand, so that while on a peak-demand day, substation load may remain over 90 percent of the daily peak until 9:00 p.m., output from solar PV resources at that hour would be of practically no value in addressing capacity needs (Exh. EFSB-PA-17).

38 In contrast, Eversource stated that its state-wide EE goal is a reduction in peak demand of two percent per year, for a three-year cumulative reduction of 600 MW (RR-EFSB-10).

cost somewhere between $48 million and $168 million over 20 years (id.).[39] Eversource indicated that several 12 MVA battery storage systems would be required to address the capacity need; that even such an arrangement would only provide power for a period of six hours, which could be insufficient in the event of a transformer outage at the Chelsea Substation; and that these systems would likely need to be replaced after a 15- to 20-year lifetime (id.; Exh. EFSB-PA-17). Based on this information, Eversource concluded that a battery storage alternative would be more costly and less reliable than the East Eagle Substation component of the Project (Exh. EV-2, at 3-16R).

2. Transmission Alternatives

Eversource assessed five transmission alternatives to address the identified need (Exhs. EV-2, at 3-3R to 3-15R; EFSB-PA-26).[40] The Company used a two-step approach in developing these alternatives: first, Eversource identified substation alternatives to address the need for additional capacity at the Chelsea Substation; and second, the Company identified alternative transmission configurations that would supply the expanded substation infrastructure while addressing the post-contingency loss of load and low voltages in the Chelsea/East Boston/Lynn Load Area (Exh. EV-2, at 3-1R, 3-3R). The transmission alternatives identified by Eversource are as follows:

- Solution 1 (the Project plus connecting distribution feeders): Two new underground 115 kV transmission lines from Chelsea Substation to Mystic Substation looping through a new East Eagle Substation in East Boston (Exh. EV-2, at 3-4R).

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39 Eversource obtained price estimates for energy storage facilities from five storage system suppliers (Exh. EV-2, at 3-16R). Four of the price estimates ranged from $48 million to $68 million; the fifth price estimate specified an annual cost of $8.4 million for 20 years (id.).

40 Additionally, the Company requested from National Grid an assessment of the viability of constructing a new 12.4-mile transmission line from Wakefield Junction to the Chelsea Substation; due to the extensive length and impact of such an alternative, Eversource did not further consider this option (Exh. EV-2, at 3-7R).

- Solution 2: One new underground 115 kV transmission line from Chelsea Substation directly to Mystic Substation, in addition to two new underground 115 kV transmission lines from Mystic Substation to a new East Eagle Substation, and associated distribution feeders (Exhs. EV-2, at 3-7R).
- Solution 3: One new underground 115 kV transmission line from Chelsea Substation directly to Mystic Substation, in addition to two new underground 115 kV transmission lines from Chelsea Substation to a new East Eagle Substation, and associated distribution feeders (Exh. EV-2, at 3-8R).
- Solution 4: One new underground 115 kV transmission line from Chelsea Substation directly to Mystic Substation, in addition to the expansion of the Chelsea Substation, and associated distribution feeders (Exh. EV-2, at 3-9R).
- Solution 5: One new underground 115 kV transmission line from Chelsea Substation directly to Mystic Substation, in addition to the construction of a new 115/14 kV substation on a Company-owned parcel in Chelsea, and associated distribution feeders (Exh. EFSB-PA-26).

Further detail on each of these five transmission alternatives is provided below.

a. The Proposed Project (Solution 1)

As described in Section I.A, the Project would include a new, approximately 16,800-square-foot, 115/14 kV substation on currently vacant Company-owned property on East Eagle Street in East Boston (Exh. EV-2, at 3-4R). The Substation would include 115 kV gas-insulated switchgear ("GIS") equipment, six 115 kV circuit breakers, two 37/50/62.5 MVA 115/14 kV transformers, and associated 14 kV switchgear (id.). The firm capacity of the Substation would be 75 MVA, with the potential for future expansion to 110 MVA if necessary (id.).[41] The East Eagle Substation would be served by two new 115 kV underground transmission connections – one from the Mystic Substation (approximately 3.2 miles long) and

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[41] The Company stated that in order to accommodate a wider range of future load growth scenarios, it proposes to construct the East Eagle Substation with the foundation and underground duct bank facilities necessary to accommodate the addition of a third 115/14 kV transformer (Exh. EV-2, at 3-4R). Eversource stated that the incremental cost of installing the foundation and duct bank at this time would be approximately $50,000, roughly half the cost of installing them at a future date (Exh. EFSB-PA-7). Eversource stated that if and when a third transformer is required, the Company would "petition the Siting Board as necessary to allow the installation" (Exh. EFSB-G-19).

one from the Chelsea Substation (approximately 1.5 miles long) (id.; RR-EFSB-54(S-1)(R-1)(1)).

According to the Company, approximately 1.7 miles of the proposed underground transmission lines would be installed within existing conduits, consisting of the Chelsea Creek Crossing, which runs approximately 1,660 linear-feet under Chelsea Creek, and the Eastern Avenue Duct Bank, which runs approximately one linear-mile from the exit of the Chelsea Creek Crossing in Chelsea to the Company's Chelsea Substation (Exhs. EV-2, at 1-8R, 5-149). The Company stated that some work would also be required at the Chelsea and Mystic Substations to connect these new transmission lines, including the installation of terminal cable structures and relaying equipment (Exh. EFSB-PA-8). Finally, in addition to the Project facilities for which the Company has sought Siting Board approval, the Company would install approximately 1.5 miles of new distribution conduit containing 3.6 miles of new distribution feeders in East Boston to make use of the new East Eagle Substation capacity (id. at 1-1R; RR-EFSB-54(S-1)(R-1)(1)).

Eversource stated that in order to compare the cost of the Project on a consistent basis with other transmission alternatives considered, the Company established conceptual grade (minus 25 percent to plus 50 percent) cost estimates for both the transmission and distribution investments required (RR-EFSB-64). These estimates were subsequently updated when the Company established its planning grade estimates for the Project (minus 25 percent to plus 25 percent) (RR-EFSB-54(S-1)(R-1)). Cost estimates for the transmission alternatives assessed remained at a conceptual level (Company Supp. Brief at 3).[42] On this basis, the Company estimated the cost of the Project at $149.1 million (id.).

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[42] The Company's 115 kV transmission line cost estimates ranged between approximately $12.2 million and $13.0 million per mile (RR-EFSB-41(S-1)(R-1)(1). The Company's distribution cost estimates calculate to approximately: (1) $12.5 million per conduit mile for Solutions 1, 2, and 3; (2) $21.2 million per conduit mile for Solution 4; and (3) $18.0 million per conduit mile for Solution 5 (Exh. EFSB-C-10; RR-EFSB-54(S-1)(R-1)(1)).

b. Solution 2

Solution 2 would consist of a new 75 MVA East Eagle Substation and associated distribution expansion (as described above for Solution 1),[43] as well as a new underground 115 kV transmission line from the Mystic Substation directly to the Chelsea Substation, and two new underground 115 kV transmission supply lines from the Mystic Substation to the East Eagle Substation (for a total of approximately 10.2 miles of new 115 kV transmission) (Exhs. EV-2, at 3-7R; EFSB-PA-14; RR-EFSB-54(S-1)(R-1)(1)).[44] Eversource stated that Solution 2 would require additional work beyond that proposed for the Project at both the Mystic and Chelsea Substations in order to connect the three new 115 kV transmission lines proposed, including construction of an elevated platform above the existing GIS equipment at the Mystic Substation to accommodate the necessary GIS expansion (Exhs. EV-2, at 3-7R; EFSB-PA-8; Tr. 9, at 1603-1604). Eversource estimated the cost of Solution 2 at $211.8 million (RR-EFSB-54(S-1)(R-1)(1)).

c. Solution 3

Solution 3 would consist of a new 75 MVA East Eagle Substation and associated distribution expansion, as well as a new underground 115 kV transmission line from the Mystic Substation directly to the Chelsea Substation (as described above for Solution 2), along with two new underground 115 kV transmission supply lines from the Chelsea Substation to the East Eagle Substation (for a total of approximately 6.9 miles of new 115 kV transmission lines)

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[43] Eversource noted that under Solutions 2 and 3, the East Eagle Substation would differ slightly from the proposed Project in that only two 115 kV circuit breakers (rather than six) would be required due to the radial nature of the transmission connection proposed (Exh. EV-2, at 3-8R; Tr. 1, at 152).

[44] The Company's assessment of Solution 2 assumed the same route between the Mystic and East Eagle Substations as proposed for Preferred Route for the Project; however the Company stated it is unknown at this time whether there is sufficient space within city streets to accommodate the two proposed transmission lines (Exh. EV-2, at 3-11R).

(Exh. EV-2, at 3-8R, 3-11; RR-EFSB-54(S-1)(R-1)(1)).[45] According to the Company, work at both the Mystic and Chelsea Substations would be required to connect the three proposed new lines, including the installation of an elevated platform above existing air-insulated switchgear at the Chelsea Substation (Exhs. EV-2, at 3-8R; EFSB-PA-8(1); Tr. 9, at 1604). Eversource estimated the cost of Solution 3 at $213.1 million (RR-EFSB-54(S-1)(R-1)(1)).

d. Solution 4

For Solution 4, rather than construct a new substation in East Boston, the Company would expand the existing Chelsea Substation (Exh. EV-2, at 3-9R). The Company would also construct a new approximately 3.8 mile-long underground 115 kV transmission line from the Mystic Substation directly to the Chelsea Substation (id.; RR-EFSB-54(S-1) (R-1)(1)).[46] This solution would increase the capacity of the Chelsea Substation by 48 MVA, and would require approximately 2.9 miles of new distribution conduit ("conduit miles") and approximately 20.3 miles of new distribution feeders ("feeder miles") to connect customer load in East Boston (Exh. EV-2, at 3-13R; Tr. 2, at 300-301; RR-EFSB-54(S-1)(R-1)(1)).[47] As with the other solutions proposed, connection work would be required at both the Mystic and Chelsea Substations (Exhs. EV-2, at 3-9R; EFSB-PA-8(1)). The Company stated that, as with Solution 3, Solution 4 would require the construction of an elevated platform above existing air-insulated switchgear to accommodate new substation equipment due to space constraints at the Chelsea

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45 Similar to Solution 2, the Company's assessment of Solution 3 did not consider whether or not there is sufficient space within city streets to accommodate the two transmission lines proposed between the Chelsea Substation and the East Eagle Substation (Exh. EV-2, at 3-11R).

46 Eversource stated that the 3.8-mile-long transmission line would follow a similar route to the Preferred Route for the Project, however at the Chelsea Creek Crossing, rather than crossing into East Boston, the transmission line would continue along the Primary Route to the Chelsea Substation via Willow Street, Cottage Street and Eastern Avenue, before entering the Chelsea Substation Station at Willoughby Street (RR-EFSB-64).

47 According to the Company, expanding the Chelsea Substation would increase the number of distribution lines exiting the substation from 30 to 46 (Exh. EV-2, at 3-14R).

Substation (Exhs. EV-2, at 3-9R; EFSB-PA-8(1); Tr. 2, at 260). In addition, the Company identified concerns with the feasibility of constructing both the necessary distribution feeders and the new 115 kV transmission line between the Mystic and Chelsea Substations (Tr. 1, at 161-162). The Company stated that there is not enough space in the existing electrical egress from the Chelsea Substation to accommodate both sets of facilities (id.).[48] Due to this high level of congestion, as well as the greater number of distribution feeders required, the Company indicated that per-mile distribution costs would be substantially higher for Solution 4 than they would be under Solutions 1, 2, or 3, and estimated the total cost of Solution 4 at $172.9 million (Exh. EV-2, at 3-14; Tr. 2, at 240-243, RR-EFSB-54(S-1)(R-1)(1)).

e. Solution 5

In response to questions from staff, the Company developed a fifth transmission alternative, identified herein as Solution 5.[49] For this alternative, the Company would construct a new 75 MVA substation, with the same components as proposed for the East Eagle Substation, on a Company-owned parcel of land approximately one half mile north of the existing Chelsea Substation on Crescent Avenue in Chelsea (the "Crescent Avenue Site") (Exhs. EFSB-PA-26; EFSB-C-17; CF-48(1); RR-EFSB-65).[50] A new approximately 4.5-mile-long underground 115 kV transmission line would be constructed to connect the Mystic Substation to the Crescent Avenue Site, and then to connect the Crescent Avenue Site to the Chelsea Substation (RR-EFSB-54(S-1)(R-1)(1); RR-EFSB-65). As with the other solutions proposed, connection

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48 Eversource stated that congestion constraints would continue to exist after exiting the Chelsea Substation and would make routing the additional distribution feeders to East Boston very difficult (Exh. EFSB-PA-10; Tr. 1, at 162-164).

49 The Company described Solution 5 as a "conceptual approach," and stated that it had not performed any of the required engineering to develop Solution 5 (RR-EFSB-65).

50 The Company stated that the Crescent Avenue Site is comprised of two contiguous parcels owned by the Company, one at 196 Crescent Avenue, and a second adjacent property on Vila Street, all in Chelsea (Exh. EFSB-PA-13; RR-EFSB-65). Together, the two parcels have a total area of approximately 0.42 acres (Exh. EFSB-PA-13).

work would be required at both the Mystic and Chelsea Substations (RR-EFSB-62(1)). Additional distribution feeders from the Crescent Avenue Site to East Boston would also be required (RR-EFSB-65). According to the Company, distribution feeders from the Crescent Avenue Site to the Chelsea Creek Crossing would use the same route proposed for Solution 4 along Eastern Avenue, requiring the construction of approximately 3.5 miles of new distribution conduit and approximately 23.9 miles of new distribution feeders (id.; RR-EFSB-54(S-1)(R-1)(1)). Eversource estimated the cost of Solution 5 at $181.9 million (RR-EFSB-54(S-1)(R-1)(1)).

f. Company's Assessment of the Transmission Alternatives

The Company's assessment of the five transmission alternatives began with a comparison of the Project and Solutions 2 and 3, all of which would involve construction of a new substation in East Boston, but would differ in terms of the associated transmission supply (Exh. EV-2, at 3-9R to 3-10R). Eversource considered the Project the best option of the three because, while the three options would provide a similar level of reliability, the Project would involve the least amount of transmission line construction (id.; RR-EFSB-54(S-1)(R-1)(1)).[51] According to the Company, the Project offers significant cost savings and lower environmental impacts because underground construction is expensive and the Project has less underground transmission construction than Solutions 2 or 3 (Exhs. EV-2, at 3-10R; EFSB-PA-24; RR-EFSB-12; RR-EFSB-54(S-1)(R-1)(1); RR-EFSB-65). The Company asserted that Solution 2 would cost approximately 42 percent more than the Project, and Solution 3 would cost approximately 43 percent more than the Project (RR-EFSB-12; RR-EFSB-54(S-1)(R-1)(1)). Additionally, both Solution 2 and Solution 3 would have greater environmental impacts compared to the Project for all categories of environmental factors that were considered (RR-EFSB-65(2)). Based on its assessment, the Company eliminated Solutions 2 and 3 from further consideration.

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[51] The Project would require two lines totaling approximately 4.8 miles, while Solutions 2 and 3 would require three transmission lines totaling approximately 10.2 miles and 6.9 miles, respectively (RR-EFSB-54(S-1)(R-1)(1)).

Next, the Company compared the Project to Solutions 4 and 5, in which additional substation capacity would be developed in Chelsea rather than in East Boston.

i. Comparison to Solution 4

With respect to Solution 4, for which the additional substation capacity would be installed at the existing Chelsea Substation, the Company asserted that the Project is superior from a reliability and cost perspective, while Solution 4 would have less potential for environmental impacts (Exh. EV-2, at 3-13R to 3-15R). The Company concluded that the Project is superior to Solution 4 due to the greater reliability benefits provided and lower project cost (id. at 3-15R; Company's Reply Brief at 29). The Company's assessment of Solution 4 is described below.

(A) Reliability and Cost

According to the Company, the Project would add more substation capacity to the system than Solution 4, would be better positioned to support load growth in East Boston in years beyond those forecast, and would avoid the need for an unusually complex substation design and the associated risks of customer outages (Exh. EV-2, at 3-13R to 3-14R; Tr. 1, at 153-154).

Eversource stated that there is limited land available at the Chelsea Substation, with most of the site encumbered with existing substation infrastructure and the necessary clear zones around such equipment (Exh. EV-2, at 3-13R; Company Reply Brief at 26). According to the Company, because of this space constraint and the electrical design of the existing substation, the addition of a fourth transformer would provide only 48 MVA of additional capacity, rather than the 75 MVA, at minimum, of incremental capacity provided by the Project (Exh. EV-2, at 3-13R; Tr. 1, at 110-113, Tr. 2, at 300-301; RR-EFSB-13). Additionally, Eversource stated that the expansion of the Chelsea Substation would require a more complex design (e.g., an elevated platform for new GIS equipment above existing energized equipment) necessitating a longer construction period and resulting in a greater risk of customer outages relative to construction of a new substation (Exh. EV-2, at 3-13R).

The Company stated that due to utility congestion in the streets surrounding the Chelsea Substation, construction of the distribution feeders required to support Solution 4 would be significantly more complex and costly compared to those needed for the Project (Exhs. EV-2, at 3-14R; EFSB-C-15; Tr. 1, at 162-163). Eversource stated that there is only enough room in the existing electrical egress from the Chelsea Substation to accommodate the proposed new 115 kV transmission line, which would create difficulties for the Company when trying to install the necessary new distribution feeders (Tr. 1, at 161-162). Furthermore, the congestion and close proximity of so many distribution feeders in a single path of electrical egress would result in mutual heating, and a corresponding reduction in the carrying capacity of each feeder (Exh. EV-2, at 3-14R). As a result, the Company would need to transfer load off of the existing distribution feeders, further increasing the cost and complexity of Solution 4 (id. at 3-14R).[52]

Finally, Eversource stated that the Project would be better positioned to support load growth in East Boston than Solution 4, placing the new substation capacity in East Boston, closer to the customers the Company intends to supply (Exh. EV-2, at 3-13R; Tr. 1, at 170). Eversource stated that Solution 4 would require approximately 20.3 miles of distribution cable, compared to approximately 3.6 miles required in association with the Project (RR-EFSB-54(S-1)(R-1)(1)). Eversource stated that the shorter distribution feeder lengths proposed under the Project would reduce the risk of power outages and would decrease energy losses along the feeders (Exh. EV-2, at 3-13R).

Taking the increased complexity of Solution 4 into consideration, Eversource estimated the cost of this solution at $172.9 million – 16 percent more than the Project[53] – and stated that

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52 Eversource stated that there is sufficient room in the proposed electrical egress from the East Eagle Substation to avoid any mutual heating concerns in association with the Project (Tr. 2, at 290).

53 In its Reply Brief, the Company states that Solution 4 would be "nine percent more expensive than constructing the East Eagle Street Substation..." (Company Reply Brief at 29). Staff calculated that based on the latest cost figures provided by the Company, the cost differential would be (($172.9 million - $149.1 million) / $149.1 million), or 16 percent.

this estimate represented a "lower bound" estimate for the cost of Solution 4 (RR-EFSB-54(S-1)(R-1)(1); Tr. 2, at 282).

(B) Environmental Impacts

Comparing the environmental impacts of the Project and Solution 4, the Company stated that the potential impacts from the construction of the transmission and distribution lines associated with the two options would be similar, but that on balance Solution 4 would have a lower potential environmental impact because it would not require the construction of a new substation, but rather expansion of an existing one (Exhs. EV-2, at 3-14R; CF-EV-46).

Table 4, below, provides a summary of the Company's assessment of the potential environmental impacts associated with the transmission line components of the Project and Solution 4. Environmental impacts associated with the construction of the distribution feeders proposed in association with the Project and Solution 4 were not provided by the Company, as the routing for distribution feeders associated with Solution 4 was highly uncertain (RR-EFSB-65(2); Tr. 2, at 264-265, 291-292).

Table 4. Comparison of the Environmental Impacts of the Transmission Line Components of the Project and Solution 4 as Presented by the Company

Solution	Number of Nearby Receptors[54,55]				
	Housing Units	Commercial / Industrial Buildings	Sensitive Receptors	Historic & Archaeological Resources	MassDEP Listed MCP Sites
Solution 1 (Project)	386	220	8	34	73
Solution 4	358	218	6	32	65

Source: RR-EFSB-65(2).

According to the figures in Table 4, the Company asserted that construction of the transmission line components of Solution 4 would result in lower environmental impacts across the breadth of the environmental impact categories assessed by the Company (RR-EFSB-65).

Eversource argued that while specific information on the number of nearby receptors impacted by the distribution feeder construction associated with Solution 4 was not available, a high level comparison with the impacts of the proposed Project could be made by comparing the total length of transmission and distribution construction required under each transmission alternative (Exh. CF-EV-46). According to the Company, Solution 4 would require a similar amount of total transmission and distribution line construction as the Project – approximately 6.7 miles of new conduit for Solution 4, vs. 6.3 miles of new conduit for the Project – resulting in similar environmental impacts between the two transmission alternatives (id.; Exhs. EFSB-C-21; EFSB-C-22; RR-EFSB-54(1)(S-1)(1)).

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54 Environmental impacts numbers presented are solely for the transmission components of the Project and Solution 4, and do not consider the additional distribution feeder lengths proposed or substation construction, which would impact additional receptors (Exh. CF-EV-46; RR-EFSB-65(2)).

55 Eversource stated that there are no MassDEP Wetlands, Natural Heritage Estimated or Priority Habitat, Outstanding Resource Waters, or Certified Vernal Pools along either of the transmission routes proposed for the Project or Solution 4 (RR-EFSB-65(2)).

With respect to substation construction, Eversource stated that there would be greater environmental impact associated with the new East Eagle Substation compared to expansion of the Chelsea Substation because there would be a change in land use at that site (i.e., a new substation to be constructed where there is no substation today) (Exhs. EV-2, at 3-14R; CF-EV-46). However, the Company stated that the work required to expand the Chelsea Substation would not be insubstantial, doubling the height of the existing facility and increasing the visual profile at the substation (Exh. CF-EV-46). In comparison, Eversource stated that the proposed East Eagle Substation would be more easily screened and would have a relatively lower visual profile (id.).

ii. Comparison to Solution 5

Eversource stated that the Project is superior to Solution 5 from a reliability, cost, and environmental perspective (RR-EFSB-65). The Company's assessment of Solution 5 is described below.

(A) Reliability and Cost

Eversource stated that as with Solution 4, Solution 5 would involve the development of additional substation capacity in Chelsea rather than in East Boston (RR-EFSB-65). According to the Company, a new substation on the Crescent Avenue Site would have the same electrical design as the proposed East Eagle Substation, and would provide an equal increase in substation capacity (id.; Tr. 10, at 1636; RR-EFSB-54(1)(S-1)(1)). However, the Company stated that, as with Solution 4, Solution 5 would result in a less reliable solution than the Project, in part because Solution 5 would require approximately 23.9 miles of new distribution feeders, compared to the approximately 3.6 miles that would be required for the Project (Tr. 9, at 1610-1611; RR-EFSB-54(S-1)(R-1)(1); RR-EFSB-65). According to the Company, these longer feeder lengths would increase the exposure of the distribution the system to outages and increase distribution system losses (RR-EFSB-65). Additionally, Eversource stated that the distribution feeders required to support Solution 5 would take a similar route to those proposed under Solution 4, resulting in significant congestion along a single path of egress on Eastern

Avenue towards the Chelsea Creek Crossing (id.). According to the Company, the congestion and close proximity of these distribution feeders would result in mutual heating and a corresponding reduction in the feeders' carrying capacity (id.). Thus, Eversource stated that additional distribution system work would be required to move load off of the existing feeders onto new feeders, further increasing the complexity of this transmission alternative (id.).

Eversource estimated the cost of Solution 5 at $181.9 million, approximately 22 percent more than the Project (RR-EFSB-54(1)(S-1)(1)). Eversource stated that this estimate was conservative, as the distribution system costs included did not reflect known additional costs, such as the need to cross an active railroad located north of the Chelsea Substation (id.; Exh. EFSB-C-14; RR-EFSB-65).

(B) Environmental Impacts

Comparing the environmental impacts of the Project and Solution 5, the Company stated that the Project is superior to Solution 5 on the basis of the total miles of in-street conduit installation required, and the density of commercial/industrial and residential uses in the immediate vicinity of the Crescent Avenue Site (RR-EFSB-65).

Table 5, below, provides a summary of the Company's assessment of the potential environmental impacts associated with the transmission line components of the Project and Solution 5, which the Company characterized as "similar" (id.). As with Solution 4, detailed environmental impacts associated with the construction of the distribution feeders proposed in association with the Project and Solution 5 were not provided by the Company, as the routing for the distribution feeders associated with Solution 5 was highly uncertain (id.).

Table 5. Comparison of the Environmental Impacts of the Transmission Line Components of the Project and Solution 5 as Presented by the Company

Solution	Number of Nearby Receptors[56,57]				
	Housing Units	Commercial / Industrial Buildings	Sensitive Receptors	Historic & Archaeological Resources	MassDEP Listed MCP Sites
Solution 1 (Project)	386	220	8	34	73
Solution 5	358	230	8	32	65

Source: RR-EFSB-65(2).

According to the figures in Table 5, the Company asserted that construction of the transmission line components of Solution 5 would result in equal or greater environmental impacts compared to the Project with respect to commercial/industrial buildings and sensitive receptors, and lesser impacts compared to the Project with respect to housing units, historical and archaeological resources, and MassDEP-listed Massachusetts Contingency Plan ("MCP") sites (RR-EFSB-65). Eversource stated that construction of the distribution feeders required in association with the Project and Solution 5 would add to the environmental impacts identified in Table 5 (id.). According to the Company, while specific distribution feeder routes have not been developed, approximately 3.5 miles of additional distribution conduit would be required for Solution 5 (id.; RR-EFSB-54(1)(S-1)(1)). Thus, in total, Solution 5 would require approximately 1.7 miles more transmission and distribution conduit construction than the Project (RR-EFSB-54(1)(S-1)(1); RR-EFSB-65). Eversource concluded that the environmental impacts

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56 Environmental impacts numbers presented are solely for the transmission components of the Project and Solution 5, and do not consider the additional distribution feeder lengths proposed or substation construction, which the Company stated would impact additional receptors (RR-EFSB-65).

57 Eversource stated that there are no MassDEP identified Wetlands, Natural Heritage Estimated or Priority Habitat, Outstanding Resource Waters, or Certified Vernal Pools along either of the transmission routes proposed for the Project or Solution 5 (RR-EFSB-65).

associated with the transmission and distribution components of Solution 5 would be greater than the Project due to this additional in-street work (Exhs. EFSB-C-21; EFSB-C-22; RR-EFSB-65).

With respect to substation construction, the Company stated that the Crescent Avenue Site is located next to seven commercial/industrial units and 13 multi-family residential units (consisting of high density apartment buildings and condominium style housing), whereas the proposed East Eagle Substation site is adjacent to two commercial/industrial units and twelve multifamily residential units (consisting of two- to three-level apartment buildings) (RR-EFBS-65). Additionally, Eversource stated that while the East Eagle Substation would be located approximately 233 feet away from the closest residence, the Crescent Avenue Site would be located within 50 to 75 feet of a number of residences along Vila and Spencer Streets (Exhs. EFSB-LU-1(1); CF-EV-48(1); Company Reply Brief at 31). The Company stated that the fenceline of the Crescent Avenue Site would also directly abut sidewalks on Vila Street and Crescent Avenue, whereas the East Eagle Substation would be set back from existing adjacent roadways and sidewalks (RR-EFSB-65).

Finally, the Company indicated that no portions of the Crescent Avenue Site are proximate to water or waterfront areas, while portions of the Project transmission lines and Substation would be located within buffer zones to water resource areas (Exh. EFSB-W-1; Tr. 4, at 757-758).

C. Positions of the Parties

1. Channel Fish

Channel Fish argues that either expansion of the existing Chelsea Substation (Solution 4) or installation of a new substation at the Crescent Avenue Site (Solution 5) would be superior to the Project, as detailed below (CF Brief at 23, 33).

a. Reliability and Cost

Channel Fish argues that both Solution 4 (which would provide 48 MVA of incremental capacity) and Solution 5 (which would provide 75 MVA of incremental capacity) would satisfy

the capacity needs of the Chelsea Substation (CF Reply Brief at 26-27).[58] Channel Fish asserts that the 48 MVA increase in capacity from Solution 4 is sufficient, and better tailored to meet area needs than the 75 MVA increase in capacity provided by the Project (CF Brief at 23; CF Reply Brief at 27). Channel Fish also argues that the Chelsea Substation would provide the greatest opportunity for future expansion, as the Chelsea Substation site is approximately seven times larger than the proposed East Eagle Substation site and, in Channel Fish's opinion, has available land (CF Reply Brief at 27, citing Exh. CF-2). Channel Fish asserts that this unoccupied land could be used to accommodate a fourth transformer without the need for any complicated substation design (CF Brief at 31). Channel Fish argues further that the distribution feeder lengths required under Solutions 4 and 5 would be typical for an urban environment and similar to the length of existing distribution lines running from the Chelsea Substation to East Boston, and thus should be of comparable reliability (CF Reply Brief at 29-30, citing Tr. 3, at 535-536). Additionally, Channel Fish states that the Project would require longer transmission line construction than Solutions 4 and 5, which Channel Fish argues is typically more complex and expensive to install than distribution (CF Reply Brief at 29-30, citing RR-EFSB-65; Tr. 2, at 234-236).

Channel Fish challenges the Company's cost estimates for the Project, and for Solutions 4 and 5, arguing that the estimates were untimely and that they contain numerous errors and unexplained adjustments (CF Supp. Brief at 2). Channel Fish further asserts that discrepancies between the Company's claims regarding the need for the construction of an elevated platform at the Chelsea Substation, as well as what Channel Fish characterized as unnecessary and inflated distribution feeder costs, call in to question the validity of the cost estimates provided by the Company (CF Brief at 31-33, 35-37; CF Supp. Brief at 9-10). According to Channel Fish, rather than basing its cost estimates on sound engineering practices, the Company disingenuously reduced the cost of the Project and increased the costs of

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[58] As discussed above in Section II.D, Channel Fish does not agree that the Company has demonstrated a need for any additional substation capacity, but for the sake of argument, accepts the Company's load forecast in its discussion of general reliability here (CF Brief at 23-24).

Solutions 4 and 5 to dissuade the Siting Board from approving the alternatives (CF Brief at 29-32, 35-37; CF Supp. Brief at 2, 11).

Channel Fish identified the following points as "among the most glaring deficiencies" in the Company's cost estimates, and submits that Eversource has failed to prove by substantial evidence that the proposed Project is the lowest-cost alternative (CF Supp. Brief at 2-3).

- A $17.8 million discrepancy between the stated cost of expanding the Chelsea Substation and the Company's actual itemized costs for said expansion;
- Disparate treatment of common cost elements, whereby certain elements (e.g., "materials") were assigned lower estimates for the Project than for Solutions 4 and 5;[59]
- Reliance on unfinished, dissimilar projects in support of current cost estimates, as well as failure to consider any projects that involved construction of an elevated platform when estimating the cost of Solution 4;
- An eight-figure cost reduction made after the Project's planning-grade cost estimate was complete, precipitated by instructions from Company senior management to "aggressively" lower the estimate to avoid the Siting Board "re-open[ing] the record;" and
- Manipulation of total cost estimates by decreasing the dollar allowance for construction contingencies associated with the Project, while simultaneously increasing them for Solutions 4 and 5.

(CF Supp. Brief at 2).

Channel Fish argues that these issues are particularly significant because any cost difference between the Project and Solutions 4 and 5 "falls easily within the estimates' stated 25% margin of error" (CF Supp. Brief at 3).

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[59] In addition to the example of "materials" costs, Channel Fish argues that the Company failed to substantiate its use of disparate cost estimates for the distribution feeders associated with the Project and Solutions 4 and 5 (CF Brief at 36, citing RR-EFSB-65; Tr. 10, at 1660).

b. Environmental Impacts

Channel Fish argues that either Solution 4 or 5 would be preferable to the Project from an environmental impact perspective (CF Brief at 26-29, 33-34). Channel Fish argues that the Project, including all lines and the Substation, would impact a greater number of housing units and MCP sites than either Solution 4 or 5, and would impact an equal or greater number of sensitive receptors (CF Reply Brief at 28, citing RR-EFSB-65(2)).[60] Additionally, Channel Fish asserts that the Project would impact a greater number of commercial/industrial buildings than Solution 4, though fewer than Solution 5 (CF Reply Brief at 28, citing RR-EFSB-65(2)). Thus, Channel Fish argues that the Company's claim that the Project would have less impact on residents, businesses, and sensitive receptors is incorrect (CF Reply Brief at 27-28).

Channel Fish also raises a number of specific concerns regarding the environmental impacts and constructability of the proposed East Eagle Substation site, which it argues would be avoided if either Solution 4 or Solution 5 were implemented (CF Brief at 26-29, 33). These concerns are described below.

i. Water-related Impacts

As further described below, Channel Fish argues that the proposed East Eagle Substation would have greater water-related impacts than expansion of the Chelsea Substation or construction of a new substation at the Crescent Avenue Site, either of which would avoid water-related impacts due to their inland locations (CF Brief at 24, 26-27, 33).

Channel Fish states that the proposed East Eagle Substation site would be located within a 100-foot wetlands buffer, and that the Substation's northern boundary would be twelve feet away from the mean high-water line (id. at 26, citing Exhs. EFSB-V-1(1); EFSB-Z-10(1)). Channel Fish asserts that, given the Substation's proximity to the Chelsea Creek, there is a substantial likelihood that the Substation will be impacted by the effects of storm surges and

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60 Channel Fish notes that while there are 13 residences located within 300 feet of the Crescent Avenue Site compared to twelve residences within 300 feet of the proposed East Eagle Street Substation site, no in-street construction on residential roads would be required in association with Solution 5 (CF Brief at 34).

rising sea levels (CF Brief at 26). Channel Fish acknowledges that the Company undertook "some steps" to account for this concern by proposing to build the Substation at an elevation of 19.42 feet relative to mean lower low water ("MLLW"), but argues that the risk was not entirely alleviated (id. at 27, citing Exh. EFSB-W-5; Tr. 8, at 1382).

Additionally, Channel Fish notes that in November 2015, the U.S. Army Corps of Engineers ("USACE") issued a public notice of its intent to perform "an emergency streambank protection project" ("Streambank Project") along the northeast portion of the City Parcel (CF Brief at 42, citing Exh. CF-13). Channel Fish argues that the purpose of the Streambank Project is to stabilize the shoreline in this area to prevent exposure and damage to a 140-year-old combined sewer outflow ("CSO") that runs underground along the property line separating the City Parcel and Channel Fish (CF Brief at 26, 43-44). Channel Fish states that the fenceline of the East Eagle Substation would be within approximately two feet of the CSO easement, and argues that the Company has not received any confirmation from the USACE that the proposed Substation would not interfere with its project or endanger the stability of the CSO (id. at 43, citing Tr. 7 at 1148, 1165, Tr. 9, at 1503-1504; RR-EFSB-51). Channel Fish further states that the Streambank Project includes work to restore salt marsh habitat that was historically present in the Chelsea Creek (CF Brief at 44, citing Exh. CF-13 at 2). Channel Fish argues that the Company has failed to demonstrate that the Substation would not adversely affect restored salt marsh habitat (CF Brief at 44).

Finally, Channel Fish states that the East Eagle Substation would be located on filled tidelands subject to MassDEP jurisdiction under G.L. c. 91 ("Chapter 91"), in a Designated Port Area ("DPA"), and in a City of Boston waterfront manufacturing district (CF Brief at 24). Channel Fish asserts that: (1) Chapter 91 codifies the Commonwealth's desire to "preserve and protect the rights in tidelands of the inhabitants of the commonwealth by ensuring that the tidelands are utilized only for water-dependent uses or otherwise serve a proper public purpose"; (2) state regulations created DPAs to promote "commercial fishing, shipping, and other vessel-related activities associated with water-born commerce, and of manufacturing processing, and production activities…"; and (3) the City of Boston Zoning Code protects water-dependent businesses operating in waterfront districts by establishing buffers and expressly forbidding the

placement of substations in these areas (id. at 44-45). Thus, Channel Fish argues that the proposed site is not an appropriate location for a new substation (id. at 23-24, 42-46).

ii. Safety

Channel Fish argues that there are a number of unique safety risks associated with the proposed East Eagle Substation (CF Brief at 24, 33, 38-39). Channel Fish states that the City of Boston plans to develop a soccer field immediately to the west of the proposed Substation site (id. at 39). Channel Fish claims that the placement of a substation in such close proximity to a soccer field is unprecedented and should not be approved (id.).[61] Channel Fish argues that safety risks are exacerbated by the Company's plans to use a short fence around roughly half of the Substation's perimeter, which Channel Fish asserts would be scalable (id. at 40-41).

Additionally, Channel Fish states that the Substation would be located approximately 30 feet from the Channel Fish building, where ammonia is used, and within 300 feet of a Sunoco fuel depot (Tr. 5, at 791; CF Brief at 41, citing Tr. 5 at 790).[62] Channel Fish asserts that the close proximity of the proposed Substation to these facilities creates a risk of large-scale explosions that could "decimate the surrounding community and cause multiple fatalities" (CF Brief at 41). Channel Fish argues that substations are considered "highly probable ignition sources," and for that reason should be separated from buildings using ammonia systems by a distance of at least 100 feet, and from tank farms by a distance of 250 to 350 feet (id. at 41-42, citing Tr. 5, at 791-793). Channel Fish argues that the Company fails to abide by these guidelines here, and asserts that it is "telling that Eversource has never before placed a substation within 30 feet of any anhydrous ammonia refrigeration plants," and that the Siting Board should not permit the Company to do so here (CF Brief at 42).

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61 Channel Fish states that none of Eversource's existing substations are located as close to a playing field as the East Eagle Substation would be (CF Brief at 40, citing Tr. 10, at 1677-1683; RR-EFSB-66).

62 Channel Fish stated that there could be up to 9,000 pounds of ammonia at its facilities (Tr. 5, at 790).

iii. Magnetic Field Impacts

Channel Fish argues that interference from electric and magnetic fields ("EMF") associated with the operation of the Substation would negatively impact its business, as further described in Section V.C. 4, below (CF Brief at 45). Channel Fish asserts a magnetic field increase of one to two milligauss ("mG") from an external source such as the Project would present a "substantial risk" of adversely affecting its equipment (id. at 47). Channel Fish asserts that magnetic field impacts to its operations would be avoided if Solution 4 or 5 were implemented (id. at 24; CF Reply Brief at 28, 30).

iv. Availability of the Proposed Substation Site

Channel Fish states that in February 2016, the City of Boston's Department of Public Works ("DPW") announced plans to transport and store the deconstructed Northern Avenue Bridge on the City Parcel (CF Brief at 27, citing Exh. CF-15).[63] Channel Fish states that the DPW's plans show portions of the bridge will be stored on the proposed Substation site (CF Brief at 27). Channel Fish acknowledges claims by the Company that the City will in fact not store materials on the portion of the City Parcel owned by Eversource, but argues that regardless of whether or not bridge components are stored directly on the Substation site, the size and scope of the bridge storage project would impede, or outright preclude, construction of the Substation until after the bridge is removed (CF Brief at 28, citing RR-EFSB-52).

Channel Fish also asserts that Eversource's ownership of the proposed Substation site is subject to legal challenge (CF Brief at 28). Channel Fish asserts that the City of Boston acted in violation of its public bidding requirements during Eversource's acquisition of the site, and that the legal remedy for such a violation is invalidation of the property disposition (id. at 28-29, citing Exh. EFSB-CF-3(S-1)(1) at 2, 51, 81, 222, 731, 1199). Channel Fish argues that no such legal uncertainty exists for the Company's Chelsea Substation site (CF Brief at 29).

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63 The Northern Avenue Bridge is a bridge that spans the Fort Point Channel between Atlantic Avenue and Boston's Seaport District and is no longer in use.

v. Tree Removal

Channel Fish states that construction and operation of the East Eagle Substation would require the removal of 35 trees in and around the City Parcel (Exh. EFSB-V-10(1); Company Brief at 108; CF Reply Brief at 29). According to Channel Fish, no trees would need to be removed if the Company implemented Solution 4 or 5 (CF Reply Brief at 29, citing Exh. CF-2; CF-EV-48(1)).

2. Company Response

Contrary to Channel Fish's position, the Company maintains that Solutions 4 and 5 would be less reliable and more expensive than the Project (Company Reply Brief at 25-33). Eversource asserts that expansion of the Chelsea Substation has formidable construction impediments, noting that: (1) the Company's expert, its Director of Substation Engineering, testified that there would be inadequate space at the Chelsea Substation to accommodate the fourth transformer and ancillary equipment required under Solution 4; and (2) the routing of the necessary distribution lines under Solution 4 would have adverse impacts on existing infrastructure and would present significant, potentially insurmountable, engineering challenges (id. at 26-28, citing Tr. 3, at 539-542; RR-CF-14(1)). Additionally, the Company argues that although it has developed only a concept for the distribution component of Solution 4, it is clear that the Chelsea Substation is more remote from the load in East Boston (driving a need for longer feeders), and that a substantially greater number of distribution lines would be required (Company Reply Brief at 28). Eversource argues that although detailed engineering has not been completed, due to the construction challenges associated with this alternative, Solution 4 would be more expensive than the Project (id. at 29). For these reasons, as well as those described in Section III.B.2.f.i, above, the Company argues that Solution 4 is a clearly inferior option (id.).

With respect to Solution 5, the Company argues that, contrary to Channel Fish's position, the Crescent Avenue Site is not a more advantageous location for the Project (id. at 30). Eversource maintains that the Crescent Avenue Site would not be suitable for the Project because it would require longer feeders than the proposed Project and would not be as well positioned to supply load growth in East Boston (id.). According to the Company, the major drawback

associated with Solution 5 is the impact and cost associated with the extensive distribution infrastructure that would be required to move power south from the Crescent Avenue Site to East Boston (id.).

Eversource contests Channel Fish's criticisms of its cost estimates for the transmission alternatives, arguing that Channel Fish has misconstrued the record evidence and failed to recognize the complex and iterative nature of cost estimating (Company Supp. Reply Brief at 1-7). Eversource maintains that its estimates are reliable, consistent with Siting Board precedent, and more than adequate for the Board's informed review and decision (Company Supp. Brief at 9).

Contrary to Channel Fish's position, Eversource asserts that there is no discrepancy in its cost estimate for the Chelsea Substation expansion (Company Supp. Reply Brief at 2). Eversource states that it used a "bottoms up" (sic) analysis to prepare the updated Solution 4 cost estimate, and that this updated analysis *in combination with* certain additional itemized costs accounts for the total increase in the cost of the alternative (id., emphasis added). Eversource argues that differences in the complexity and length of the distribution feeder expansions required under the transmission alternatives, as well as differing assumptions for assignment of costs to cost categories (rather than any actual difference in the costs themselves), are responsible for what Channel Fish characterizes as a "[d]isparate treatment of common cost elements" (id. at 2-3). Eversource states that it developed its cost estimate for the Project using information collected from a variety of sources, including historical company experience, and argues that although the costs of its Seafood Way and Electric Avenue substation projects are not yet final, it is appropriate to use contract bids and other available information from these contemporaneous projects to inform its cost estimates for the Project (id. at 4). Eversource states that, in contrast, due to its unconventional design, cost information from comparable projects was not available for the elevated platform required under Solution 4, and as such other sources of information were used (id.).

Eversource argues that the large volume of documents and email correspondence produced in this proceeding does not reveal any nefarious motive on behalf of the Company, but rather illustrates "the sharing of ideas and active engagement in the deliberative process"

undertaken by the Company to produce reliable cost estimates, and a "complete and thoughtful review" of project cost estimates by the Company's senior management (Company Supp. Reply Brief at 5-6). Eversource further argues that the use of different contingency factors for the Project and Solutions 4 and 5 is reasonable and appropriate given the different level of information available for the various alternatives (id. at 7). Finally, with respect to the confidence level of the cost estimates provided, Eversource notes that the range associated with its Project cost estimates is narrower than that of the alternatives – i.e., plus or minus 25 percent for the Project versus plus 50 percent/minus 25 percent for the alternatives (Company Supp. Brief at 7-8).

Eversource also disagrees with Channel Fish's arguments regarding the suitability of the Substation site (Company Reply Brief at 18). With respect to the potential for damage due to storm surge and rising sea levels, the Company states that it undertook a flood elevation study for the Substation site, and argues that based on this study, placing Substation equipment at a minimum elevation of 22 feet above MLLW would cover expected sea level rise over the life of the Project coincident with a 0.2 percent annual chance flood event (id. at 24). As such, the Company argues there is no factual basis for Channel Fish's allegation that there is a substantial likelihood that the Substation would be affected by storm surges and rising sea levels (id.). In response to Channel Fish's arguments relating to shoreline erosion, Eversource states that while the City Parcel abuts Chelsea Creek, the Substation site itself does not abut the shoreline (id. at 22). Eversource maintains that the Project would not exacerbate shoreline erosion, but rather would result in an improvement to stormwater runoff management on a site that currently lacks stormwater management controls (id. at 39-40). Additionally, Eversource argues that both the City of Boston (the sponsor of the Streambank Project) and the USACE are aware of the proposed East Eagle Substation, and that the USACE has not voiced any concerns regarding the Company's proposal (id. at 22). Regarding Channel Fish's argument that the Project would interfere with planned salt marsh habitat restoration within Chelsea Creek, Eversource submits that the scope of the restoration project has changed such that no restoration work in the vicinity of the Substation site is included (id. at 38-39). Regarding the CSO, Eversource maintains that it has designed the Substation such that no part of the Substation, including the fence, would be

within the City of Boston's easement for the CSO (id. at 39, n.23). The Company argues that as a result, the Substation would have no impact on the City's ability to maintain or repair the sewer, and that the City of Boston has expressed no reservations with regard to the location of Substation relative to the CSO (id.).

The Company maintains that the Substation's location in a waterfront manufacturing district does not make the site inappropriate (Company Reply Brief at 18-19). Eversource argues that the Legislature enacted state law specifically for the purpose of allowing the Siting Board and the Department to exempt needed energy infrastructure from the operation of restrictive and prohibitive zoning bylaw and ordinance provisions (id. at 18, citing Section 6 of Chapter 665 of the Acts of 1956 for Boston, and G.L. c. 40 A § 3 for all other cities and towns). Eversource asserts that the construction of needed energy facilities for the good of all citizens of the Commonwealth (in balance with the consideration of local interests such as those of Channel Fish) is precisely the reason zoning exemptions are available to public service corporations (Company Reply Brief at 18). With respect to Channel Fish's argument about City of Boston zoning requirements, Eversource notes that the City supports the requested zoning exemptions (id. at 18-19, citing Exh. EFSB-Z-7(S1)). Furthermore, regarding the Substation's location on filled tidelands and in a DPA, Eversource argues that MassDEP has determined that the Project is a water-dependent use project and therefore neither of these factors represents an impediment to the Project (Company Reply Brief at 19).

Responding to Channel Fish's claims that the location of the East Eagle Substation site represents an undue safety risk, the Company maintains that the Substation is designed to create a safe environment for both electrical equipment and the surrounding neighborhood (Company Reply Brief at 36-37).[64] Eversource argues that there is ample record evidence demonstrating that no safety hazard would be created as a result of the Substation's proximity to a soccer field (id. at 19-21, 36). The Company maintains that: (1) analysis of EMF from the Substation demonstrates that there would be no impacts to players and spectators at the proposed soccer

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[64] See Section V.C.3. below, for further details on the Company's plans to ensure safe construction and operation of the proposed Project.

field; (2) the Substation would have solid walls around exposed electrical equipment and would be enclosed with a protective, non-conductive covering over the top of the transformers;[65] and (3) that there would be no way for individuals to scale the fence around the Substation in an attempt to recover any stray balls that may enter the facility (id. at 20-21). Additionally, Eversource submits that it is important to recognize the City of Boston's involvement in establishing the proposed East Eagle Substation location within the City Parcel, as well as the active involvement of City of Boston agencies throughout various phases of the Substation development (id. at 19-20). According to the Company, the City of Boston has not expressed any safety concerns relating to the proximity of the proposed Substation and its planned soccer field (id. at 20).

Regarding the location of the Substation next to a facility containing ammonia, Eversource states that, according to Channel Fish, a required separation of 100 feet applies when a facility has at least 10,000 pounds of ammonia (Company Reply Brief at 36, citing Tr. 5, at 790). Eversource states that even if the Substation were subject to such a requirement, Channel Fish's facility does not meet the 10,000-pound threshold (Company Reply Brief at 36). Eversource characterizes Channel Fish's assertions that the proximity of the Substation to a Sunoco fuel depot would create the risk of large scale explosions as "fear mongering at best" (id. at 22-23). Eversource argues that the design of the Substation ensures it is not an ignition risk, submitting that the Substation would be: (1) constructed in accordance with all applicable safety codes; (2) surrounded by a protective, non-conductive covering; and (3) designed to conduct stray current (e.g., a lightning strike) to ground in a manner that would prevent any potentially hazardous arcing (id.).

Responding to Channel Fish's arguments that EMF from the Project would negatively impact its business, Eversource states that its EMF assessment demonstrates that, with two transformers in operation, magnetic field levels at the closest portion of the Channel Fish

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65 As discussed further in Section V.C.3, below, Eversource stated that the non-conductive covering over the top of the Substation transformers would be angled slightly so that if an errant soccer ball were to clear the approximately 25-foot tall wall in this area it would roll backwards towards the soccer field (Tr. 3, at 428-430; RR-EFSB-79(1) at 4).

building would be only slightly above 1.0 mG (Company Reply Brief at 40).[66,67] Eversource submits that Channel Fish has acknowledged that this magnetic field level would not result in adverse impacts, and therefore bases its assertion on the "unproven proposition" that operation of the Substation would result in magnetic field levels greater than those predicted by the Company (id., citing Exh. CF-9, exh. C, at 1). Eversource argues that the mere positing of an adverse impact does not represent substantial evidence of an impact that requires mitigation or that can be the basis of the Siting Board's disapproval (Company Reply Brief at 40).[68] Eversource submits that Channel Fish has no documented evidence supporting its claim that low-level power-frequency magnetic fields will or are likely to cause interference problems with Channel Fish's equipment (Company Reply Brief at 43). Eversource concludes that Channel Fish's concerns regarding the magnetic field impacts of the Project are "hypothetical and baseless" (id. at 44).

Finally, regarding the availability of the Substation site, Eversource states that the City of Boston has no existing rights to use the Company's property to store components of the deconstructed Northern Avenue Bridge, and that the City has confirmed it will not do so (Company Reply Brief at 23). Moreover, Eversource argues that the proposed storage of the bridge components elsewhere on the City Parcel would coincide with the Company's use of the Substation site for only a short period of time (id.). Eversource disagrees with Channel Fish's assertion that its ownership of the Substation site is "legally tenuous," and argues that, regardless of the ownership status, resolving third-party real estate disputes is beyond the Siting Board's

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66 Eversource characterizes a magnetic field level of one mG as "negligible" (Company Reply Brief at 40).

67 See Section V.C.4. below, for further details on the Company's assessment of the magnetic field impacts of the Project and proposed mitigation.

68 Eversource submits that "substantial evidence" is defined under G.L. c. 30A § 1(16) as evidence that "a reasonable mind might accept as adequate to support a conclusion," and that the Supreme Judicial Court has stated that mere speculation or theoretical notions, which are not supported by the record, do not comprise substantial evidence (Company Reply Brief at 40).

authority, and that the Board has no basis for relying upon the outcome of a speculative lawsuit as a rationale for rejecting the Project (id. at 25).

D. Analysis and Findings on Project Approaches

As described above, the Company identified a number of potential alternative approaches to meeting the identified need. The Company's assessment showed that an NTA alone, or in combination with other alternatives, would be either insufficient and/or significantly more expensive to implement than the Project. Accordingly, the Siting Board finds that these options do not merit further consideration in this instance. The Siting Board continues to expect that Eversource will strongly encourage its customers, both existing and new, to take full advantage of EE programs.

With regard to the transmission alternatives assessed, the Company showed that the Project would provide a similar level of reliability, at a lower cost, and with less environmental impact than Solutions 2 or 3. Accordingly, the Siting Board finds that these options do not merit further consideration in this instance.

With respect to the reliability of Solutions 4 and 5 as compared to the Project, the Siting Board agrees with the Company that, generally, it is prudent to develop new electrical substations in close proximity to the load they are intended to serve. In this case, the comparatively remote location of the Chelsea Substation and the Crescent Avenue Site from growing customer demand in East Boston, and the corresponding need for the construction of a large number of relatively long distribution feeders, makes Solutions 4 and 5 less reliable than the Project.[69] Additionally, the record shows that due to the highly congested nature of the underground utilities in the area around the Company's Chelsea Substation and Crescent Avenue Site, implementation of Solution 4 or 5 would have an adverse impact on existing distribution

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[69] While the Project would require approximately one mile of additional transmission compared to Solution 4, this greater transmission requirement is small in comparison to the approximately 16.7 miles of additional distribution feeders required in association with Solution 4.

infrastructure, decreasing the carrying capacity of the existing distribution feeders, and increasing the cost and complexity of the solution.

Further, for Solution 4, in terms of the Substation capacity added by a transmission alternative, all else equal, the Siting Board views a solution that provides a larger increase in capacity as a more robust and flexible alternative. While both solutions would provide sufficient capacity to meet forecast demand, in this case, the 75 MVA increase in substation capacity provided by the Project (compared to a 48 MVA increase provided by Solution 4) would allow the proposed transmission investment to reliably serve customers under a greater range of possible future load growth conditions, and would provide increased flexibility to the transmission and distribution system. Finally, the Siting Board accepts the expert testimony of John Zicko, the Company's Director of Substation Engineering, regarding the availability of space within the Chelsea Substation and the design of the electrical facilities required to install a fourth transformer on the site. Accordingly, the Siting Board concurs with the Company that implementation of Solution 4, in comparison to the Project, would require Eversource to undertake a more complex effort that is more vulnerable to construction contingencies. Therefore, for the reasons noted above, the Siting Board concludes that the Project would provide greater reliability than either Solution 4 or 5.

Channel Fish has expressed concerns with the validity of the Company's cost estimates. First, regarding the timeliness of the Company's revised costs, as noted in Section I.B.2.b, above, updated cost information was provided in response to a record request made during the evidentiary hearings in this proceeding, and thus the Company's revised estimates are an appropriate addition to the record. Nevertheless, the Siting Board notes that provision of planning grade cost estimates earlier in this proceeding would have facilitated a more efficient and timely evaluation of the Company's transmission alternatives.

The record shows that Eversource performed a bottom-up analysis to establish the costs of the transmission alternatives, and that the Company reasonably relied on comparable project costs, where such information was available. The record further shows that the Company has applied varying levels of contingency for different components of the three transmission alternatives. The Siting Board accepts these differences as reasonable in light of the varying

degree of confidence associated with the cost of various transmission alternative components. The Board further accepts that by its nature the cost estimating process is iterative, and estimates may undergo extensive internal review and revision prior to finalization. An extensive internal review process will tend to result in higher quality cost estimates. The Board reminds Eversource that the provision of timely, high quality, and reliable cost estimates is essential for effective review of project alternatives.

Regarding transmission and distribution costs, in prior cases where cost comparisons for project alternatives have been presented, project proponents have typically relied on generic per-mile estimates. The record shows that, in this case, the Company used similar dollar per-mile cost estimates for the transmission line component of the Project, Solution 4, and Solution 5 (with cost estimates as high as approximately $13.0 million per cable mile for the Project, and as low as $12.7 per cable mile for Solution 4). However, the Company's distribution cost estimates calculate to approximately $12.5 million per conduit mile for the Project, $21.2 million per conduit mile for Solution 4, and $18 million per conduit mile for Solution 5. There is a question as to whether the use of disparate per-mile cost estimates for distribution conduit is warranted here.[70] Siting Board staff calculates that if consistent distribution costs of $12.5 million per conduit mile were used across all three alternatives, the Project would be approximately equal in cost to Solution 4, and approximately nine percent less expensive than Solution 5.[71] However, this comparison omits consideration of the likely technical difficulties associated with the distribution feeders required under Solutions 4 and 5.

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70 The Company's justification for disparate distribution cost estimates was that it anticipated a high level of congestion and the need for multiple distribution feeders under Solutions 4 and 5; however, the Company had not conducted engineering estimates for these alternatives to confirm its anticipated conditions.

71 Under such a scenario, the cost of the distribution component of Solutions 4 and 5 would be approximately $36 million and $44 million, respectively (rather than the Company's estimate of $61.2 million and $62.7 million, respectively). As a result, the total cost estimate for Solution 4 would be approximately $148 million and the total cost estimate for Solution 5 would be approximately $163 million. In comparison, the Company's estimated cost for the Project including associated distribution feeders is $149.1 million.

Considering both uniform distribution costs and the Company's estimate, the evidence on balance indicates that the Project would likely cost less than Solution 4 or Solution 5.

A significant body of evidence has been presented on the relative environmental impacts of the Project and Solutions 4 and 5. The Siting Board appreciates the efforts of the parties in this proceeding to fully develop the record in this regard. The record shows that construction of the transmission line components of the Project would result in impacts to a greater number of housing units, commercial/industrial buildings, sensitive receptors, historic and archaeological resources, and MassDEP-listed MCP sites than Solution 4, and a greater number of housing units, historical and archaeological resources, and MCP sites than Solution 5. The record also shows that the disparity between the environmental impacts of the alternatives is somewhat reduced when the impacts associated with distribution construction (for which specific route information is not available) are considered. With respect to the substation component of the Project, the Siting Board concludes that development of the East Eagle Substation would result in greater environmental impacts than expansion of the existing Chelsea Substation as proposed under Solution 4. The Siting Board also concludes that, while the specific impacts that would result from construction of the East Eagle Substation and from construction of a new substation on the Company's Crescent Avenue Site would differ, taken together the extent of the impacts would be similar.[72]

Based on the enhanced reliability and likely lower cost of the Project compared to Solutions 4 and 5, the Siting Board finds that the overall benefits of the Project outweigh the environmental advantages of the alternatives described above.[73] Therefore, having reviewed non-transmission and transmission alternatives, the Siting Board finds that the Project is superior

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[72] Regarding the availability of the proposed Substation site, the record shows that the City of Boston has no plans to store bridge components on the Company-owned portion of the City Parcel. Furthermore, Channel Fish's assertion that the City of Boston violated public bidding requirements is not an issue within the scope of this proceeding. We note that Channel Fish has not asserted that there is any pending litigation on this issue.

[73] See Section V below, for details on the mitigation measures proposed by the Company to minimize the environmental impacts associated with construction and operation of the Project.

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.

IV. 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. Walpole-Holbrook at 31; Mystic-Woburn at 26; Boston Edison Company d/b/a NSTAR Electric, EFSB 04-1/D.T.E. 04-5/D.T.E. 04-7 (2005) ("Stoughton/Boston") 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. Transmission Route Selection Process

Based on its conclusion that two 115 kV cables installed within the streets of Everett, Chelsea and East Boston, between (1) the Mystic Substation and the proposed East Eagle Substation, and (2) the proposed East Eagle Substation and the Chelsea Substation, would be the best alternative to meet the identified need, the Company undertook a process to identify potential routes for the Project (Exh. EV-2, at 4-1).

The Company first demarcated two study areas, the Mystic-East Eagle Study Area and the East Eagle-Chelsea Study Area (id.; Exh. EFSB-RS-1).[74] Within each study area, the Company first identified existing utility infrastructure that could be used to carry the proposed New Lines (Exh. EV-2, at 4-1). The Company identified the Chelsea Creek Crossing, consisting of three sets of conduits which travel from East Eagle Street and Condor Street in East Boston, via the Chelsea Creek, and terminate at Marginal Street and Willow Street in Chelsea; the Chelsea Creek Crossing can be used for both lines (id. at 4-5).[75] The Company also identified the Eastern Avenue Duct Bank in Chelsea, which consists of two duct banks travelling approximately one mile from the termination of the Chelsea Creek Crossing, along Willow Avenue, Cottage Street, Eastern Avenue, and Willoughby Street to the Chelsea Substation (id.).[76]

The route selection analysis process was conducted using the same methodology for both the Mystic-East Eagle and East Eagle-Chelsea Lines (Exh. EV-2, at 4-39). The Company

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74 The Mystic-East Eagle Study Area is defined by Route 99/Broadway to the west; Route 16 and an MBTA railroad to the north; Eastern Avenue/Marginal Street and the Grand Junction railroad right-of-way to the east; and Condor, Terminal, and Medford Streets to the south (Exh. EV-2, at 4-2). The East Eagle-Chelsea Study Area is defined by Hawthorne Street and Broadway to the west; Crescent Avenue to the north; Eastern Avenue to the east; and Marginal Street to the south (id. at 4-5).

75 The Chelsea Creek Crossing was installed in 2011; two duct banks are currently used for distribution while the remaining duct bank can accommodate either distribution or transmission cables (Exhs. EV-2, at 4-5; EFSB-RS-2). The Company stated that it has assessed the design and condition of the crossing and it is suitable for the proposed Project (Exhs. EV-2, at 4-5; EFSB-RS-2). The total cost of the entire Chelsea Creek Crossing was $24.9 million; the approximate incremental cost of the portion to be used for the proposed Project is $4.5 million (Exh. EFSB-RS-4).

76 The Eastern Avenue Duct Bank was completed in 2015 (Exh. EFSB-G-12; RR-EFSB-69). The occupied duct bank serves distribution and the available duct bank can accommodate either distribution or transmission cables (Exh. EV-2, at 4-5). The total cost of the Eastern Avenue Duct Bank was $7.2 million; the approximate portion of the total cost of the duct bank to be used for the proposed Project is $4.3 million (Exh. EFSB-RS-5).

screened out several possible routes based on feasibility concerns (id. at 4-9).[77] The route segments that were not screened out were combined into "candidate routes" and assessed in more detail by applying a set of environmental and constructability criteria, and evaluating conceptual cost estimates (id. at 4-6, 4-23). The Company explained that it prefers direct routes over circuitous routes, since shorter routes generally have less environmental impact, involve less construction disruption, and are generally less expensive and easier to maintain, as well as the use of established ROWs (id. at 4-6; Exhs. EFSB-RS-1; Jacobs-1).

The Company developed six candidate routes for the Mystic-East Eagle Line,[78] and three candidate routes for the East Eagle-Chelsea Line (Exh. EV-2, at 4-19, 4-48 to 4-49). To evaluate the relative environmental impacts of these routes, the Company developed twelve criteria (seven environmental and five constructability) as follows: (1) residential land uses; (2) commercial/ industrial land uses; (3) sensitive receptors; (4) historic and archeological resources; (5) potential for traffic congestion;[79] (6) number of public shade trees; (7) potential to encounter subsurface contamination during construction; (8) the length of the route; (9) existing road width; (10) existing utility density; (11) number of hard angles; and (12) number of railroad crossings (id. at 4-23 to 4-32).

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77 The Company screened out certain routes in the preliminary assessment for the Mystic-East Eagle Line including a route using railroad alignments, a submarine route, routes with additional crossings of the Mystic River and Upper Harbor, and routes utilizing other roadways in Chelsea and Everett (Exh. EV-2, at 4-9 to 4-19). The Company screened out certain routes in the preliminary assessment for the East Eagle-Chelsea Line including the use of the Grand Junction railroad right-of-way and roadways in Chelsea (id. at 4-40 to 4-49).

78 Of the six routes, one was a variation of Route A (the Primary Route), Variation A-1 along Bow Street; and one was a hybrid route consisting of Route A and Route B, the Hybrid A/B Route (Exh. EV-2, at 4-37).

79 Factors that the Company used in determining the score for traffic congestion included: existing traffic volumes; presence of major commuting routes; roadway widths; number of travel lanes; existence and utilization of parking; and number and frequency of MBTA routes and service (Exh. EFSB-RS-9).

The Company used a ratio scoring technique with the route with the highest potential impact receiving a "1" and the other routes assigned a ratio score based on their comparative relationship to that route (Exh. EV-2, at 4-29). The Company then weighted the criteria to reflect the relative importance of each criteria (id. at 4-29). The Company stated that in order to assign a weight reflective of the impact, it solicited input from officials from each city, the Island End Business Group, and the public (id. at 4-32). The criteria of residential land uses, commercial/industrial land uses, and potential for traffic congestion were each assigned a triple weight; sensitive receptors, existing road width, and existing utility density were each assigned a double weight; and the remaining criteria were each assigned a weight of one (id. at 4-33). The Company then developed a cost for each of the candidate routes based on a generic cost-per-mile of $10 million for an underground 115 kV line (id. at 4-37R).

The Company provided further explanation of some of the criteria that relate to construction disruption. The Company explained that access to abutter's properties was considered as part of the residential and commercial/industrial land use categories, based on the assumption that the more residences and business that abut a route, the more potential for impacts due to temporary traffic, access, or parking disruption; street closings; noise, and/or dust (Exh. Jacobs-3). In order to analyze traffic impacts, the Company obtained existing traffic information from city departments or through public documents for proposed or ongoing projects that were available during the period of the route selection analysis, as well as conducted field reconnaissance (Exh. Jacobs-5).

The weighted score and projected cost of each of the candidate routes for the Mystic-East Eagle Line is shown below in Table 6.

Table 6. Mystic-East Eagle Candidate Route Scoring

Routes	**Route Length** (miles)	**Ratio Score** (raw)	**Ratio Score** (weighted)	**Environmental Score Rank**	**Cost** (millions)
Route A	3.23	7.25	12.37	1	$32.3
Variation A-1 (Bow Street)	3.23	7.39	12.76	2	$32.3
Hybrid A/B	3.80	7.94	13.45	3	$38.0
Route B	3.59	10.16	18.15	5	$35.9
Route C	3.51	9.86	17.40	4	$35.1
Route D	3.99	10.62	19.04	6	$39.9

Sources: Exh. EV-2, at 4-38R; RR-VRT-2(2).

The Company stated that for the Mystic-East Eagle Line, it selected Route A as the Primary Route because it is superior to the alternative routes based on environmental impacts and constructability, as well as the lowest cost (Exh. EV-2, at 4-39). The Company stated that all routes are similar with regard to reliability (id. at 4-38). The Company acknowledged that Route A is an important trucking route with a high volume of traffic, but asserted that the roads on the route are wide and that traffic management can effectively maintain the flow of traffic (id. at 4-39). Variation A-1 (Bow Street) was selected as a Noticed Variation to the Primary Route (id.).[80]

The Company stated that it selected Route B as its Noticed Alternative Route due to its geographic diversity and the determination that it is constructible (Exh. EV-2, at 4-39). For the Mystic-East Eagle Line, the Primary Route and the Noticed Alternative Route only overlap on a portion of Alford Street in the vicinity of the Mystic Substation and both use the Chelsea Creek Crossing (id. at fig. 4-7). The Company explained that although Route C would be lower cost than Route B and scored better than Route B with regard to environmental and constructability impacts, Route C significantly overlaps the location of Route A (id. at 4-39; RR-VRT-2(2)). Specifically, the Company explained that Route B provides an alternative to the 1.6-mile overlap

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80 The Company subsequently determined that Variation A-1 is not feasible as there was insufficient room to physically install transmission facilities in Bow Street due to existing MWRA infrastructure (Tr. 2, at 360; Tr. 9, at 1495).

along Beacham, Robin, Dexter, and Alford Streets that exists between Route C and Route A, therefore it is the alternative proving the most geographic diversity (Exh. EFSB-RS-12; Company Brief at 66). The Company further noted that it selected Route B as it could be combined with Route A to produce the Hybrid A/B Route and therefore could be considered as a potential option (Tr. 3, at 394, 395; Company Brief at 66).[81] In addition, the Company pointed out that although the score of the Hybrid A/B Route is close to other routes from an environmental perspective, it is the second highest cost (Tr. 3, at 397).

For the East Eagle-Chelsea Line, Route 1, the Primary Route, received the best score for environmental and constructability, and is the lowest cost alternative (Exh. EV-2, at 4-57R, 4-58). The Company therefore concluded that Route 1, utilizing the existing Eastern Avenue Duct Bank, would result in lower environmental impacts and lower cost than the alternatives (id., at 4-51 to 4-58). The Company selected Route 2 as the Noticed Alternative Route since it ranks second in terms of environmental impact and cost, is constructible, and is geographically distinct (id. at 4-58). For East Eagle-Chelsea Line, the Primary Route and the Noticed Alternative Route only overlap exiting the Chelsea Substation, on a portion of Willow Avenue in the vicinity of the Chelsea Creek Crossing, and both use the Chelsea Creek Crossing (id. at fig. 4-7).

C. Substation Site Selection Process[82]

The Company stated that the selection of the East Eagle Substation site and the location of the New Lines on the City Parcel were governed by the terms of a land swap with the City of

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81 The Hybrid A/B Route would include a short stretch, on Spruce Street, that was not described as part of Route A or Route B (Tr. 3, at 396). All four business owners on this street received notice of the Project because they are within 300 feet of Route A or Route B (id.; RR-EFSB-72).

82 The Substation alone would not be a "facility" subject to Siting Board review under G.L. c. 164, § 69J. However, the Substation site selection process is discussed in its own section (Section IV.C, below) because the Substation is a component of the Project for which the Company considered a number of alternative sites. In addition, the Substation is the subject of the Company's requested zoning exemptions, discussed in Section VII, below.

Boston (Exhs. CF-EV-6; EFSB-RS-21). The Company and the City of Boston conducted a real estate transaction in 2011 whereby the City-owned East Eagle site was traded for Eversource-owned property at 365 Prescott Street – property that the City wanted to use to locate the new East Boston Branch of the Boston Public Library (Exhs. CF-EV-6; EFSB-RS-21; EFSB-Z-10(1) at 18).[83,84] According to the Company, the City of Boston did not offer any other sites and indicated the possibility that it would use eminent domain to acquire the Prescott Street property if an agreement was not reached (Exh. CF-6; Tr. 3, at 401-404; Tr. 12, at 2006). Although the Company proposed to locate the Substation adjacent to the Chelsea Creek Crossing (on the west side of the City Parcel), the City rejected this proposal and the Company was directed to the current location, the east side of the City Parcel (Exhs. CF-EV-25; CF-EV-49; Tr. 12, at 2005, 2062-2064). The Company stated that the City of Boston required that the Substation be located near the eastern lot line – adjacent to the Channel Fish property – and provided design input to ensure that the City would transfer as small a portion of the City Parcel to the Company as possible (Tr. 12, at 2007-2008).

The Company explained that the City of Boston would not grant an easement across the City Parcel to connect the proposed East Eagle Substation to the Chelsea Creek Crossing, because the City wanted to preserve the rest of the City Parcel for future development (Exhs. EFSB-RS-16; EFSB-RS-19; CF-EV-49).[85] Therefore, no on-site direct connection exists from the proposed Substation to the Chelsea Creek Crossing easement, which is located on the west side of the City Parcel, and instead the interconnection would travel south along a new Substation access driveway, west along East Eagle Street and north along Condor Street to connect to the Chelsea Creek Crossing (Exhs. EV-2, at Fig. 5-3; EFSB-RS-19). The Company

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83 The Company had identified the Prescott Street location as the original site for a proposed East Boston substation (Tr. 12, at 1998).

84 The East Boston Branch of the Boston Public Library opened on Prescott Street in 2013 (Exh. EFSB-Z-10(1) at 18).

85 The City of Boston has plans to develop the site with a police station, public works facility, and a soccer field (see Section V.C.1**,** below) (Exh. EFSB-RS-19; RR-EFSB-24; Tr. 12, at 2007).

stated that it last met with the City of Boston in December 2015; however, it has not specifically revisited the issue of routing the line with the City of Boston since 2011 (Exh. EFSB-RS-19**;** Tr. 3, at 415).[86]

A Chapter 91 Waterways License from the MassDEP is required for the proposed East Eagle Substation and the application was submitted on November 19, 2014 (see Section V.C.5, below) (Exh. EFSB-Z-10). Since the East Eagle Substation is proposed within filled tidelands, an alternative site analysis to examine potential sites outside of jurisdictional tidelands is required by MassDEP regulations (Exh. EFSB-Z-10(1) at 18; Tr. 3, at 408). The East Eagle Substation Chapter 91 alternative site analysis used the following criteria to evaluate potential sites: (1) an East Boston location; (2) site size greater than or equal to 0.4 acres; (3) site must be undeveloped and developable; and (4) site must be outside of filled tidelands (Exh. EFSB-Z-10(S).

The Company noted that it typically prefers 40,000 to 43,000 square feet for a substation site, but that given the realities of operating in a densely populated urban setting, this is not always possible (Exhs. EFSB-RS-20; CF-47). The Company indicated that the use of the smaller East Eagle Substation site (approximately 17,000 square feet), would provide less buffering to surrounding uses and would require special considerations such as securing laydown space for future maintenance (Exh. EFSB-RS-20).

Two additional sites in East Boston were identified in the alternative site analysis: (1) the Frankfort Street Parcel; and (2) the McClellan Highway Parcel (Exh. EFSB-Z-10(1) at 19). The Company stated that the Frankfort Street Parcel, owned by the Roman Catholic Church, is located next to a school, in a densely populated neighborhood (id.). The Company concluded that the noise and visual impacts, as well as an additional one-mile transmission line

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86 The Company provided a diagram of the possible location of a direct interconnection from the proposed Substation to the Chelsea Creek Crossing using an existing on-site manhole across the City Parcel (RR-EFSB-26(1)). The diagram was based on the City of Boston concept plan for the City Parcel as a basis for the route, which could be placed under the proposed public works yard and parking area (id.)

connection, rendered the site unsuitable (id.; Tr. 3, at 409; Tr. 4, at 730).[87] The Company also concluded that the one-mile distance from the McClellan Highway parcel to the Chelsea Creek Crossing would require additional costs to build the transmission and distribution lines to interconnect to the existing transmission and distribution systems, and therefore render the site inferior to the East Eagle Substation site (Exh. CF-EV-5; Tr. 3, at 401, 409; Tr. 4, at 731). Further, the estimated $3 million sale price of the privately-owned site made the McClellan Highway site economically infeasible (Exh. EFSB-Z-10(1) at 19).

D. Positions of the Parties

1. Intervenors

Jacobs asserts that alternative routes for the Mystic-East Eagle Line were not properly or adequately investigated before selecting the Primary Route (Jacobs Brief at 2). Jacobs states that the primary route selected for the Mystic-East Eagle Line would impact her commercial property as well as numerous other businesses and properties along Williams and Beacham Streets (id. at 1). Jacobs asserts, for example, that the Company did not conduct traffic studies which would determine the volume and type of traffic – such as truck and tractor trailer (id. at 3, 4; Exh. EFSB-VRT-1). The Company also did not determine the impact of construction on abutting businesses or perform analysis of the sub-surface soil conditions for contamination (Exh. EFSB-VRT-1). Jacobs contends that it appears that the Company's sole consideration in selecting its Primary Route was selecting the shortest route based on the incorrect assumption that the shortest route would cost the least and cause the least disruption (Exh. Vernhunt-1, at 2; Jacobs Brief at 3, 4).

Jacobs asserts that the Company did not adequately study the Hybrid A/B Route, even though it had the second best score (RR-VRT-2(1), RR-VRT-2(2); Jacobs Brief at 1).[88] Jacobs

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87 The Company indicated that the Prescott Street parcel was also approximately one mile from the Chelsea Creek Crossing (Tr. 3, at 415).

88 The Hybrid A/B Route had the second best score after Eversource eliminated a variation along Bow Street in Everett (Variation A-1) (RR-VRT-2(1), RR-VRT-2(2); Jacobs Brief at 3).

states that the Hybrid A/B Route avoids: (1) historic land-fill areas; (2) areas of known contamination, including manufactured gas sites; (3) areas vulnerable to sea-level rise; and (4) conflicts with major wholesale businesses serving all of New England (Jacobs Reply Brief at 5). Jacobs argues that the Company should be required to thoroughly investigate the impacts of the Hybrid A/B Route and compare it to the Primary Route, and that if the Siting Board does not require use of the Hybrid A/B Route, the Board should impose a series of conditions on the Company with regard to the Primary Route (see Section V.C.2**,** below) (Jacobs Brief at 2).

Channel Fish asserts that under G.L. c. 164 § 69J a petitioner must show that it considered a reasonable range of alternatives and that the Company has failed to meet that requirement (CF Brief at 21). Specifically, Channel Fish states that: (1) the Company did not consider any alternative sites prior to making a final decision to acquire and build at the proposed East Eagle Substation site, and (2) at least two alternate sites that Eversource already owns are clearly superior to the proposed site, on balance, in terms of minimizing adverse impacts while providing superior reliability at a cost within the Company's estimated margin of error of the Project (id.).

Channel Fish presented its understanding of the history of the "land swap" agreement with the City of Boston which resulted in the acquisition of the Substation site in 2011, and asserts that the Company did not attempt during the period of negotiations with Boston (2007 to 2011) to identify any alternative substation sites (id. at 22, citing Exh. EFSB-CF-3(S-1)(2), at 252; Tr. 3, at 548-552). Channel Fish asserts that the analysis conducted in 2014 to identify other parcels in East Boston was only conducted to satisfy a requirement for the MassDEP Chapter 91 license application (Tr. 3, at 553; CF Brief at 22). Channel Fish further notes that this analysis for suitable property by its very nature excluded the very type of land – filled tidelands – where the Company seeks to locate the East Eagle Substation (CF Brief at 22).

2. Company Response

The Company argues that its route selection process was robust, with a well-designed set of twelve environmental and constructability criteria that were applied evenly to each candidate route (Company Reply Brief at 59, 60). With regard to criticism concerning the evaluation of the

potential for traffic congestion and trucking access, the Company notes that it evaluated potential traffic impacts for each route by considering factors such as existing traffic volumes (where available), presence of major commuting routes, roadway widths, number of travel lanes, existence and utilization of parking, and the number of MBTA bus routes and bus frequency (id. at 62). Further, with regard to criticism concerning impacts to abutters, the Company maintains that it took abutter impacts into account by considering the number of commercial and/or industrial units along each route that could be affected by temporary construction impacts (id. at 63). The Company asserts that its route selection process resulted in the selection of Route A (the Primary Route) as the preferred route in conformance with applicable standards of review, and that regardless of whether Route B or the Hybrid A/B Route had been selected as the Noticed Alternative Route, the record is clear that Route A is superior to both routes (id. at 59, 63). Therefore, Company asserts that it has not overlooked or eliminated any routes that might be superior (id.).

With regard to site selection of the Substation, the Company argues that the Siting Board is not required to engage in a process of elimination to determine the best substation site (Company Brief at 98, citing Martarano, 401 Mass. at 265). The Company asserts that the Siting Board and the Department have repeatedly held that a petitioner is not required to demonstrate that its preferred project site is the best possible alternative, nor must a petitioner consider and reject every possible alternative site presented (Company Reply Brief at 15). Nonetheless, the Company explained that it did consider alternatives to the proposed Substation site (id. at 17). First it undertook a thorough analysis of adding a transformer at the Chelsea Substation site (Company Brief at 16). The Company asserted that it also reviewed alternative sites both prior to and after the City of Boston's expression of interest in acquiring the Prescott Street site (Tr. 12, at 2003-2004, 2058; Company Reply Brief at 16). Finally, the Company pointed to its analysis of alternative sites as part of its Chapter 91 Application to MassDEP (Exh. EFSB-Z-10(1); RR-CF-10; Company Reply Brief at 17).

E. Analysis and Findings on Route Selection

As described by the Company, the route selection analysis began with a decision on the substation endpoints, which governed the route selection process. As discussed in Section III.D, above, the Company determined, and the Siting Board concurs, that based on reliability and cost, the Project is best served by locating a new substation in East Boston, and connecting an East Boston substation both to the Mystic Substation, and to the Chelsea Substation. The Company therefore based its route selection process on a study area that encompassed two distinct new transmission line interconnections, the Mystic-East Eagle Line and the East Eagle-Chelsea Line. The Company used the same route selection method for the Mystic-East Eagle Line and the East Eagle-Chelsea Line and both took advantage of existing infrastructure (the Chelsea Creek Crossing and the Eastern Avenue Duct Bank, respectively) in order to minimize environmental impacts. As the Primary Route for both transmission lines, the Company selected the routes that scored the best with regard to environmental impacts, cost, and reliability.

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 issues, land use issues, community impact issues, cost, and reliability. Mystic-Woburn at 31; Salem Cables at 39; 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. Mystic-Woburn at 31; Salem Cables at 39; Boston Edison Company, EFSC 89-12A, at 34-38 (1989).

Here, the Company developed numerous criteria, which it used to evaluate the routing options. These criteria generally encompass the types of criteria that the Siting Board has found previously to be acceptable. The Company also developed a quantitative system for ranking routes based on compilation of weighted scores across all criteria. This is a type of evaluation approach the Siting Board has also found previously to be acceptable. Salem Cables at 39; IRP at 45; Stoughton/Boston at 43-45.

Jacobs has asserted that with regard to the East Eagle-Mystic Line, the Company did not adequately investigate traffic impacts, or reflect certain impacts in its choice of criteria, such as

subsurface soil conditions or construction impacts on businesses. As noted, the Company did develop numerous criteria in order to evaluate the routes, and applied a well-established and generally acceptable methodology to score the routes. Contrary to Jacobs' assertions, the Company included traffic impacts and the potential to encounter subsurface contamination. Further, construction impacts on businesses are inherently reflected in traffic as well as other criteria used in the Company's scoring analysis, such as the count of commercial/industrial land uses.

The Siting Board notes that at the stage in the project development process when the route and site selection process is undertaken, there may be criteria evaluated using information that will be refined further in the process of determining adequate mitigation. The Siting Board agrees with Jacobs that traffic impacts and the impacts on businesses along both the Primary and Noticed Alternative Routes are highly integral to analyzing the proposed Project. As discussed below in Section V.C**,** the Siting Board reviews the specific impacts in detail, analyzes any Company proposed mitigation, and conditions approval on any additional mitigation deemed necessary to minimize traffic and other environmental impacts. In sum, the Siting Board finds that the Company has 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.

With regard to geographic diversity of the Company's Noticed Alternative Route, the Siting Board notes that the Company appropriately identified a study area that would encompass all viable siting options, given the limitations imposed by an interconnection between the East Eagle and Mystic Substations and the East Eagle and Chelsea Substations, as well as the use of existing infrastructure. The Siting Board finds that the Company established two routes (the Primary Route and the Noticed Alternative Route) for the New Lines with some measure of geographic diversity.

Given the reliability benefits of locating the Substation in East Boston, discussed in Section III.D**,** above, constructing the Substation in East Boston is preferred; however, the availability of vacant parcels in a densely developed urban neighborhood is limited. The Company and the City of Boston engaged in a land swap within East Boston that resulted in the

proposed substation being confined to the eastern portion of the City Parcel, instead of the initially preferred Prescott Street site. The City of Boston did not offer any other sites to the Company, and in fact strictly prescribed the location within the City Parcel. The alternatives analysis presented to the MassDEP for the Chapter 91 license for the substation site was, by its nature, not as robust as a typical route analysis usually reviewed by the Siting Board. Nonetheless, it generally confirmed that there are not any readily available, superior sites in East Boston. Therefore, the Siting Board accepts the Company's selected location for the East Eagle Substation.

F. Conclusion

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.

V. ANALYSIS OF PRIMARY AND NOTICED ALTERNATIVE ROUTES

In this section, the Siting Board analyzes the Primary and the Noticed Alternative Routes, 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. Walpole-Holbrook at 38; Mystic-Woburn at 33; Stoughton/Boston 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 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

The total length of the Primary Route is 4.8 miles, consisting of the Mystic-East Eagle Line at approximately 3.2 miles and the East-Eagle Chelsea Line at approximately 1.5 miles (of which approximately 1.3 miles is in existing conduit) (Exh. EV-2, at 1-8R; RR-EFSB-54 (S-1)(R-1)(1)). The Primary Route for the Mystic-East Eagle Line begins at the Company's Mystic Substation in Everett and proceeds north on Alford Street/Route 99 for approximately 1,200 feet to Dexter Street (Exh. EV-2, at 5-43). Turning right on Dexter Street, the Primary Route proceeds along Dexter and Robin Streets until it intersects with Beacham Street (id.). Turning right on Beacham Street, the Primary Route proceeds southeast approximately 4,800 feet along Beacham and Williams Streets into Chelsea (id.). East of Pearl Street, Williams Street becomes Marginal Street and the Primary Route continues for approximately 3,100 feet to Willow Street (id.). Turing left on Willow Street, the Primary Route travels north approximately 230 feet to a vacant parking lot near Willow and Suffolk Streets (id. at 5-10, 5-43). In the parking lot, the Primary Route connects to the existing Chelsea Creek Crossing, and travels

approximately 1,600 feet under the Chelsea Creek and the adjacent shoreline to the west side of the City Parcel in East Boston (id. at 5-10). Traveling south on Condor Street for 170 feet, then east on East Eagle Street for 480 feet, the Primary Route reaches the east side of the City Parcel where it continues 160 feet north within the parcel to the proposed East Eagle Substation site (id.).

The Primary Route for the East Eagle-Chelsea Line exits the proposed East Eagle Substation and proceeds along the same path as the Primary Route for the Mystic-East Eagle Line to the vacant parking lot near Willow and Suffolk Streets in Chelsea (Exh. EV-2, at 5-131, 5-149). Exiting the parking lot, the Primary Route continues within the existing Eastern Avenue Duct Bank north on Willow Street for approximately 1,420 feet, east on Cottage Street for 900 feet, and then north on Eastern Avenue for approximately 2,160 feet (id. at 5-150). Turning left on Willoughby Street, the Primary Route proceeds 930 feet west to connect to the Chelsea Substation (id.).

2. Noticed Alternative Route

The total length of the Noticed Alternative Route is 5.9 miles, consisting of the Mystic-East Eagle Line at approximately 3.6 miles and the East-Eagle Chelsea Line at approximately 2.3 miles (Exh. EV-2, at 1-9R). The Noticed Alternative Route for the Mystic-East Eagle Line begins at the Mystic Substation in Everett and proceeds north on Route 99 (Alford Street in Boston and Broadway in Everett) for approximately one mile to Route 16 (Revere Beach Parkway) (id. at 5-43).[89] Proceeding east on Revere Beach Parkway, the Noticed Alternative Route turns right on Second Street and travels east towards Chelsea for just over one mile, before turning left on Chestnut Street in Chelsea (id.). After 550 feet on Chestnut Street, the Noticed Alternative Route turns right on Third Street, continuing onto Congress Avenue for approximately one-half mile to Willow Street (id.). Turning right on

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[89] Eversource stated that in order to continue north on Broadway to Revere Beach Parkway, the Noticed Alternative Route would leave the public way to pass beneath a set of railway tracks near Sweetser Circle before returning to the public way (Exh. EV-2, at 5-43, fig. 5-5, sheet 5).

Willow Street, the Noticed Alternative Route proceeds 290 feet to the existing Chelsea Creek Crossing, where it takes the same path as the Primary Route to the proposed East Eagle Substation site in East Boston (id.).

Exiting the proposed East Eagle Substation site, the Noticed Alternative Route for the East Eagle-Chelsea Line would take the same path as the Mystic-East Eagle Line to the vacant parking lot in Chelsea (Exh. EV-2, at 5-43, 5-150). Exiting the parking lot, the Noticed Alternative Route proceeds north on Willow Street for 290 feet, then east on Congress Avenue for approximately 880 feet (id. at 5-150). The Noticed Alternative Route then proceeds approximately 2,150 feet north on Highland Street (id.).[90] Turning left from Highland Street onto Gerrish Avenue, the Noticed Alternative Route proceeds approximately 800 feet west before turning right on Broadway and traveling north for approximately 480 feet, crossing the MBTA Newburyport/Rockport railroad tracks, and then continuing east on Crescent Avenue for 2,700 feet (id.). At Eastern Avenue, the Noticed Alternative Route turns south for 1,050 feet, crosses the MBTA railroad for a second time, and then heads west on Willoughby Street for 930 feet to connect to the Chelsea Substation (id.).

3. General Description of Project Construction

General construction methods for the Project would be similar for both the Primary and Noticed Alternative Routes. According to the Company, construction would be completed in four principal phases: (1) manhole installation; (2) trench excavation, duct bank installation, and initial pavement patching; (3) cable pulling, splicing, and testing; and (4) final pavement restoration (Exh. EV-2, at 5-2). The Company would conduct these four phases in sequence at each location; however, several phases of construction would likely be ongoing simultaneously

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90 Along the route of the Noticed Alternative Route, Highland Street is interrupted by a pedestrian stairway on the steep grade near Grove Street (Exh. EV-2, at 5-150). The Noticed Alternative Route continues on the alignment of Highland Street through this pedestrian area (Exh. EV-2, at 5-150).

in different portions of the route (id.).[91] In locations where the New Lines would be installed within existing conduits (i.e., along the Eastern Avenue Duct Bank and the Chelsea Creek Crossing), only the cable pulling, splicing, and testing phase would be required (id.; RR-EFSB-40). Eversource estimated Project construction would take approximately two years (Exh. EFSB-G-2(1)).

Eversource would install manhole vaults approximately every 1,500 to 2,000 feet along the route (Exh. EV-2, at 5-5). According to the Company, a total of nine new manhole vaults would be required along the Primary Route (RR-EFSB-44). A minimum of ten new manhole vaults would be required if the Noticed Alternative Route were selected, due to its greater length (RR-EFSB-44). Eversource stated that each manhole vault would take approximately five days to install (Tr. 10, at 1776-1777).

The underground duct banks for the Project would be constructed using open-cut trenching, where the Company would cut the pavement with a saw, excavate the trench to the required depth by backhoe, and then install conduit in approximately 200-foot segments; the road surface would then be restored for travel (Exh. EV-2, at 5-5 to 5-6).[92,93] A typical residence or business would see activities related to trench excavation, duct bank installation, and temporary pavement patching in the front of its home or business for roughly two to three weeks (id. at 5-6). Eversource indicated that the pace of construction may be slower in areas of higher existing utility density, where the Company encounters unanticipated obstructions, where the depth of the trench increases, or in areas with higher traffic volumes (id.). The Company expects

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91 The Company indicated that, in certain circumstances, final pavement restoration might precede cable installation (Exh. EV-2, at 5-2).

92 The Company identified two locations along the Noticed Alternative Route where a trenchless crossing method (e.g., jack-and-bore, or horizontal directional drilling) would be used to cross existing railroad tracks, rather than open-cut trenching (see Section V.C.1) (Exhs. EFSB-LU-7; EFSB-LU-15).

93 In certain locations, part of the excavation would be done by hand to avoid disturbing existing utility lines or service connections (Exh. EV-2, at 5-5).

the duration of duct bank construction at a particular location could increase up to a total of approximately five weeks, depending on these additional factors (id.).

After conduit installation, sections of the solid-dielectric transmission cable would be installed within the conduits between consecutive manhole vaults, with a cable reel located at one manhole, and a cable puller located at the other (Exh. EV-2, at 5-8). Adjacent cable sections would then be spliced together inside the manhole vaults (id.). Eversource stated that cable pulling would typically take three eight-hour days for each pair of manholes, while cable splicing would typically take four to five extended work days (up to twelve hours each) to complete (id.; Exh. EFSB-NO-4).[94]

Finally, Eversource would restore roadway pavement permanently in accordance with the street restoration standards required by the Department in D.T.E. 98-22, as well as pursuant to any agreement made with the applicable municipality (Exhs. EV-2, at 5-2; EFSB-CM-16).[95,96] Eversource indicated that it would work closely with the public works departments of Chelsea, Everett, and Boston to determine the restoration requirements for all disturbed roadways and sidewalks (Exh. EV-2, at 5-7).

Substation work for the Project would take place over a roughly 18-month period (id. at 5-9; Exh. EFSB-G-9). Eversource stated that Substation construction would involve a minimal amount of site clearing and grading, excavation, placement of concrete, and the use of typical industrial construction practices (Exh. EV-2, at 5-238, app. 5-3, at 6-1). Following initial site preparation, the Company would construct the firewalls for the transformer bays (Exhs. EV-2, at 5-9; EFSB-V3(S1)(1)). Next, the Company would install the Substation's

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94 Eversource stated that splicing solid-dielectric cables does not require continuous 24-hour activity; rather, typical work hours for Project cable splicing would be 7:00 a.m. to 7:00 p.m. (Exh. EFSB-NO-4; Tr. 6, at 1003).

95 Section 9.16 of D.T.E. 98-22 states that "[t]he [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."

96 The City of Chelsea specifically requested that, as part of the Project, Eversource provide curb-to-curb repaving of streets affected by the Project (Exh. EFSB-G-8(S1)).

electrical and GIS equipment (Exh. EV-2, at 5-9). The Company would use heavy machinery intermittently throughout Substation construction (Exh. EFSB-NO-12).

C. Environmental Impacts

1. Land Use

a. Company Description

Eversource assessed potential land use impacts from the proposed New Lines by comparing: (1) "land use by land area" (acreage) of residential, commercial/industrial, and recreational land along each of the Primary and Noticed Alternative Routes; and (2) "density of land use" (counts per route) of residences, commercial/industrial buildings, and sensitive receptors along the Primary and Noticed Alternative Routes (Exh. EV-2, at 5-133 to 5-134). Eversource also provided a comparison of the number of historic resources, public shade trees, and river, highway, rail and other significant crossings along each of the routes (id. at 5-143 to 5-146; Exhs. EFSB-LU-7; EFSB-LU-15; RR-EFSB-36). Eversource stated that because the New Lines would be installed underground, there would be no permanent impacts to land uses along either the Primary or the Noticed Alternative Routes; however there may be temporary impacts during Project construction (Exh. EV-2, at 5-134, 5-224).

With respect to the proposed East Eagle Substation, Eversource presented information on the number of residences, businesses, and other uses in the vicinity of the Substation site, as well as potential future uses within the broader City Parcel (id. at 5-237 to 5-238; Exhs. EFSB-LU-1; RR-EFSB-26). A summary of the Company's assessment of land use impacts from the installation of the New Lines along the Primary and Noticed Alternative Routes, as well as construction of the proposed East Eagle Substation, is provided below.

i. Mystic-East Eagle Line

According to the Company, land uses along the Primary and Noticed Alternative Routes for the Mystic-East Eagle Line include a mix of residential, commercial/industrial, and recreational uses (Exh. EV-2, at 5-133 to 5-134). The Primary and Noticed Alternative Routes are both primarily in commercial and industrial areas; however, Eversource stated that a greater

proportion of the Noticed Alternative Route would consist of residential use (22 percent) compared to the Primary Route (6 percent) (id. at 5-134). Eversource noted that there is one residence within 50 feet of a proposed manhole vault along the Primary Route, which is located at the corner of Robin and Lynde Streets in Everett (Exh. EFSB-CM-4). Eversource was unable to provide specific information on manhole locations along the Noticed Alternative Route, because the Company had not completed this level of design (Exh. EFSB-NO-5).

Comparing the density of land uses along the Primary and Noticed Alternative Routes, the Company stated that the Noticed Alternative Route would pass a greater number of individual residences, businesses, sensitive receptors, and recreational facilities (Exh. EV-2, at 5-135). A summary of the Company's count of land uses abutting the Primary and Noticed Alternative Routes is provided in Table 7, below.

Table 7. Summary of Land Use Counts within 25 feet of the Mystic-East Eagle Line Primary and Noticed Alternative Routes

Land Use	Primary Route (3.2 miles)	Noticed Alternative Route (3.6 miles)
Residential Units	97	534
Commercial/Industrial Buildings	130	149
Sensitive Receptors	4	9

Source: RR-EFSB-36.

As shown in Table 7, the Noticed Alternative Route would pass a greater number of individual abutters in each of the categories assessed by the Company, compared to the Primary Route. As such, Eversource concluded that the Noticed Alternative Route would have more potential temporary construction impacts than the Primary Route (Exh. EV-2, at 5-135, 5-141 to 5-142; RR-EFSB-36).

The Company also provided a comparison of the number of historic and archeological resources, and public shade trees along the Primary and Noticed Alternative Routes (Exh. EV-2, at 5-143 to 5-145; RR-EFSB-36). Eversource anticipated no impacts to historic resources along either route, as the Company had submitted a Project Notification Form to the Massachusetts Historical Commission in 2015, and had received a "no effect" determination (Exhs. EV-2,

at 5-144; EFSB-LU-10). The Company did not anticipate a need to trim the branches of any public shade trees along either route, and committed to meeting with the local tree wardens in each municipality to determine best management practices (Exhs. EV-2, at 5-145; EFSB-LU-9; Tr. 6, at 946-947).

Eversource identified two significant water and transportation crossings along the Primary Route: (1) Chelsea Creek, where the Mystic-East Eagle Line would be installed within the existing Chelsea Creek Crossing; and (2) a railroad spur at Beacham Street, where an open-cut installation would be used (Exh. EFSB-LU-7). For the Noticed Alternative Route, the Company identified two railroad crossings (one underneath the Broadway overpass near Sweetser Circle, and one on Second Street near the Everett and Chelsea border) in addition to the Chelsea Creek crossing (id.; Exh. EV-2, fig. 5-5, sheets 4 and 5). Eversource stated that a trenchless crossing method (e.g., jack-and-bore or horizontal directional drilling) would be used to complete these railroad crossings, and indicated that this would be a more involved undertaking than the open-cut trenching method proposed for the Primary Route (Exhs. EV-2, at 5-5 to 5-6; EFSB-LU-7; EFSB-LU-15).

Based on the above analysis, Eversource contends that the Primary Route for the Mystic-East Eagle Line is preferable to the Noticed Alternative Route from a land use perspective (Exh. EV-3, at 5-135; Company Brief at 76).

ii. East Eagle-Chelsea Line

The Company performed a similar assessment of land uses along the Primary and Noticed Alternative Routes for the East Eagle-Chelsea Line; however, as discussed in Section V.B. above, the Primary Route for the East Eagle-Chelsea Line would take advantage of existing underground duct banks for the majority of the route,[97] whereas the Noticed Alternative Route would require significantly more duct bank construction (Exh. EV-2, at 5-150;

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97 Existing duct banks would be used from the East Boston side of the Chelsea Creek Crossing to the Chelsea Substation, which represents roughly 90 percent of the Primary Route of the East Eagle-Chelsea Line (Exh. EV-2, at 5-1 to 5-2, 5-10, 5-149 to 5-150).

RR-EFSB-40). Eversource identified thirteen receptors near manhole locations along the Primary Route where cable pulling, splicing, and testing activities would take place (RR-EFSB-40). An additional seven residences were identified along the portion of the Primary Route between the Chelsea Creek Crossing and the East Eagle Substation site where new duct bank would be required (Exhs. EV-2, at 5-10, 5-149, 5-221 to 5-222; EFSB-MF-5(R1)).[98] In comparison, Eversource identified 494 receptors along the Noticed Alternative Route, where all phases of Project construction would occur (RR-EFSB-40). Eversource asserts that, due to the presence of the existing Eastern Avenue Duct bank, the overall potential for land use impacts along the Primary Route is significantly lower than for the Noticed Alternative Route, and as such the Primary Route for the East Eagle-Chelsea Line would be preferable to the Noticed Alternative Route from a land use perspective (id.; Exh. EV-2, at 5-225; Company Brief at 90-91).

iii. East Eagle Substation

The proposed East Eagle Substation site is a 0.38-acre parcel of land owned by Eversource, located within a larger City Parcel at 338 East Eagle Street in East Boston (Exh. EV-2, at 5-237, fig. 5-1; Tr. 12, at 1999-2000). The Substation site is located on the eastern side of the City Parcel, abutting a small inlet of the Chelsea Creek and the Channel Fish property to the east, and surrounded by the City Parcel on all remaining sides (Exhs. EV-2, at 5-237 to 5-238; EFSB-LU-1; EFSB-Z-10(1) at 11). A small area of trees is present along the eastern side of the Substation site; these trees would be removed during Project construction (Exhs. EFSB-V-2; EFSB-V-10).

Chelsea Creek runs along the northern boundary of the City Parcel, with Condor and East Eagle Streets running along the western and southern edges of the parcel, respectively (Exh. EV-2, at fig. 5-19). Across Condor Street to the west of the City Parcel is an American

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98 The approximately 1,500 foot section of the New Lines between the Chelsea Creek Crossing in East Boston and the East Eagle Substation site is common to the Primary and Noticed Alternative Routes for both the East Eagle-Chelsea Line and the Mystic-East Eagle Line (Exhs. EV-2, at 5-10, 5-43, 5-221 to 5-222; EFSB-C-21).

Legion playground, which includes two basketball courts, a play lot, and a soccer/softball field (id. at 5-238, fig. 5-19). North of the American Legion playground is the Condor Street Urban Wild, which includes restored salt marshes, meadow grasses, and walking paths (id.). South of the City Parcel, across East Eagle Street, is a residential area composed primarily of triple-decker homes (id. at 5-238, 5-241). The Substation site is located approximately 233 feet from the closest of these residences (Exh. EFSB-LU-1(1)). In total, twelve residential buildings and four businesses are located within 300 feet of the Substation site; Channel Fish, a fish-processing operation, is the closest abutter, and its building is located 18 feet to the east of the property line (id.).

A wooden CSO drain structure dating from the late 1800s runs underground along the eastern property line of the Substation site between the proposed Substation fenceline and the Channel Fish property (Tr. 6, at 1083-1085; Tr. 8, at 1310-1311; RR-CF-13). The City of Boston Water and Sewer Commission owns an easement for this CSO, which is partially located on the Eversource property (Tr. 6, at 1083-1085; RR-CF-13). Eversource stated that future maintenance and repair activities related to this CSO were considered in the design of the Substation, such that no Substation structures would be located within the CSO easement, and the easement would remain outside of the Substation's fenced area (RR-CF-15). Furthermore, Eversource indicated that the type of equipment foundations it has elected to install would limit the risk of damage to the CSO during Substation construction (Tr. 8, at 1339-1343; RR-CF-16). Eversource stated that the City of Boston had not expressed any concerns with regard to the Substation's location relative to the CSO (RR-CF-15).

With respect to land uses on the remainder of the City Parcel, Eversource stated that, currently, the City Parcel is used for vehicle storage and salt storage by the Boston DPW, as well as school bus and temporary trailer parking (Exh. EV-2, at 5-237). The City of Boston salt shed is the largest existing structure on the parcel, and adjoins the southwest corner of the proposed Substation site (id. at 5-237, fig. 5-19; EFSB-RS-19(2)). In response to questions from Siting Board staff, Eversource provided information on City of Boston plans for future redevelopment of the City Parcel, including construction of a new East Boston police station, an emergency medical services ("EMS") building, a DPW office, and a soccer field (Exh. EFSB-RS-19(2)).

Eversource indicated that these plans have been in the development stage for a number of years, and that no specific timeline for project construction has been established (Tr. 3, at 419-421; Tr. 6, at 975-976). Figure 3, below, shows the City of Boston's proposed plans for the parcel (as prepared in 2011), which, according to Eversource, may be subject to change as the City continues its development process (Exh. EFSB-RS-19(2)); Tr. 6, at 977-978).

Figure 3. City of Boston Plans for Redevelopment of 338 East Eagle Street

See Exh. EFSB-RS-19(2).

As can be seen from Figure 3, should the City of Boston proceed with its redevelopment plans as currently proposed, the East Eagle Substation site would be located immediately adjacent to a soccer field and would continue to abut the City of Boston salt storage and parking areas (Exh. EFSB-RS-19(2)). Eversource stated that because the City of Boston had not finalized its redevelopment plans or schedule, and the Company was uncertain whether the proposed redevelopment would actually come to fruition, the Company did not address these potential future land uses in its Petition (Tr. 3, at 420). Nonetheless, the Company now proposes

to mitigate potential impacts to these future uses by incorporating design elements such as a 32-foot-tall wall at the corner of the Substation closest to the soccer goal, and an approximately 25-foot-tall wall topped with a mesh screen for the remainder of the Substation western boundary (see Sections V.C.3 and V.C.7) (Exh. EFSB-RS-19(2); Tr. 3, at 428-429, 431-433; RR-EFSB-25; RR-EFSB-79(1) at 4-6).

b. Positions of the Parties

i. Jacobs

With respect to the Primary Route of the Mystic-Chelsea Line, Jacobs argues that the land under Williams and Beacham Streets can be expected to settle under the combined weight of the concrete duct bank and heavy truck traffic, resulting in damage to existing buried utilities (e.g., gas, water, and sanitary lines) (Jacobs Brief at 6; Jacobs Reply Brief at 9). Jacobs expresses concerns regarding the impact damage to these utilities would have on abutting businesses, due to both interruptions in utility service, and disruptions caused by construction associated with necessary repairs (Jacobs Brief at 7). Jacobs submits that, should the Siting Board approve the Project along the Primary Route, the Company should be required to provide structural support for all utilities in the street, including utility connections to abutters, and that such supports should be left in place after construction is completed (id. at 10).

ii. Channel Fish

Channel Fish argues that Eversource failed in its Petition to disclose the City of Boston's planned redevelopment of the City Parcel, which includes a new soccer field (CF Brief at 39-40). Channel Fish asserts that the Company attempted to mislead the Siting Board with respect to the number of Eversource's existing substations abutting recreational areas (id. at 40). Specifically, Channel Fish states that, contrary to the Company's initial representations, Eversource has admitted that none of its existing Substations are as close to a playing field as the proposed East Eagle Substation would be to the proposed soccer field (id., citing Tr. 10, at 1677-1683; RR-EFSB-66). Accordingly, Channel Fish argues that there is no precedent for locating an electrical substation immediately adjacent to a playing field, and that it would be dangerous for the Company to do so in this case (CF Brief at 38-40). Furthermore, Channel Fish states that

Eversource failed to provide a good faith response on this subject, leading Channel Fish to question the veracity of the Company's representations throughout the proceeding (id. at 40).

Additionally, Channel Fish argues that the purpose of the USACE Streambank Project (see Section III.C) is to prevent damage to the CSO running along the eastern boundary of the Substation site (CF Brief at 43, citing Exh. CF-13 at 1). Channel Fish asserts that the Company has not received any confirmation from the USACE that the proposed Substation would not interfere with its Streambank Project or endanger the stability of the CSO (CF Brief at 43-44, citing Tr. 9, at 1503-1504; RR-EFSB-51).

c. Company Response

In response to Jacobs' concerns regarding buried utilities, Eversource states that the Company's contractors would be required to provide excavation support measures during construction to prevent damage to existing utilities (Company's Reply Brief at 67-68, citing Tr. 9, at 1429-1444). Eversource further states that working around existing utilities is a standard utility construction practice, and that the Company's contractors are well equipped to handle existing buried utilities, compaction, and working in areas of fill (Company's Reply Brief at 68, citing Tr. 9, at 1449). Eversource stated that its contactor is responsible for maintaining the integrity of all existing utilities, and that the contractor would be accountable for repairing and returning to service any utilities damaged due to Project construction (Tr. 9, at 1502).

Regarding Channel Fish's concerns with potential impacts to the City of Boston CSO, as discussed previously (see Section III), Eversource argues that the Substation would have no impact on the City's ability to maintain or repair the CSO (Company Reply Brief at 39, n.23, citing Tr. 9, at 1323; RR-CF-15). The Company further argues that neither the City of Boston nor the USACE have expressed any reservations with regard to the Substation's proposed location (Company Reply Brief at 22, 39, n.23, citing Tr. 9, at 1323; RR-CF-15).

d. Analysis and Findings

The record shows that the Primary Route of the Mystic-East Eagle Line passes fewer residences, commercial and industrial buildings, sensitive receptors, public shade trees, and

historic resources than the Noticed Alternative Route. Both routes would cross under the Chelsea Creek using the same existing conduit, but the Noticed Alternative Route would cross one additional rail facility. Altogether, there is less potential for construction-related impacts along the Primary Route compared to the Noticed Alternative Route. Additionally, the availability of the already-existing Eastern Avenue Duct bank greatly reduces the potential for land use impacts along the Primary Route of the East Eagle-Chelsea Line compared to the Noticed Alternative Route. Accordingly, the Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to land use impacts.

With respect to buried utilities along the Primary Route, the record demonstrates that existing utilities would be physically supported during Project construction, and that the Company would require its contractor to repair any damage to utilities that may result from Project construction. However, the Siting Board notes that it is the Company's ultimate responsibility to ensure that its contractor constructs the Project appropriately.

The East Eagle Substation would occupy a 0.38-acre Company-owned parcel of land, located within a larger City of Boston parcel at 338 East Eagle Street. The site has been previously disturbed, and limited tree removal would be required. A CSO is located along the eastern edge of the Substation site; the City of Boston has an easement for this CSO, which is partially located on the Company's property. The record shows that Eversource has designed the Substation to avoid any overlap of the Substation fenceline and the City's CSO easement, and that the Company would install equipment foundations that would be unlikely to cause damage to the CSO. With the implementation of these measures, potential impacts to the CSO would be minimized.

The proposed Substation's location within a larger City of Boston parcel provides a setback of over 200 feet from the nearest residential buildings. Channel Fish's building would be located approximately 18 feet east of the Substation site. Potential future uses of the City Parcel include Police, EMS, and City of Boston DPW buildings, as well as a soccer field. The record shows that the City's redevelopment plans have not been finalized, and that there is uncertainty as to when, and if, they will proceed. Nevertheless, these development plans are not purely speculative in nature, and potential future uses on the City Parcel are important land use

considerations. Eversource erred by failing to address the City's pending redevelopment plans in its initial Petition. These plans are an important consideration regarding the placement of the proposed Substation on the City Parcel. In addition, Eversource failed to provide Siting Board staff with an appropriate assessment of the proximity of electrical substations to recreational areas on its system when first asked to do so.[99] The Siting Board stresses that, in future facility proceedings, Eversource must include complete and accurate information on any known and credible proposed land use changes or development activity of potential significance located on abutting properties.

The record shows that if the soccer field is constructed as currently proposed by the City, it would be the closest recreational space to a substation on the Eversource system. Eversource has designed the facility to isolate the Substation from the adjacent proposed recreational use (e.g., by including an approximately 32-foot-tall screening wall between the soccer field and the Substation) (see Sections III and V.C.3).

As discussed in Section IV.C above, the City of Boston would not grant an easement across the City Parcel to connect the proposed East Eagle Substation more directly to the Chelsea Creek Crossing, which necessitates installation of the New Lines within East Eagle and Condor Streets. However, it appears possible that, even with the City's proposed development of the rest of the City Parcel, the New Lines could be placed under planned parking areas, with minimal disruption to planned development (see RR-EFSB-26(1)). Avoiding construction on East Eagle and Condor Streets would serve to minimize construction impacts to nearby residences and the surrounding neighborhood. Accordingly, the Siting Board directs the Company to enter into discussions with the City of Boston, focusing on the ability of the Company to relocate the East Eagle Substation on the City Parcel and to acquire an easement across the City Parcel, if necessary, for the installation of the New Lines, and to provide an update to the Board on the status of such discussions, (preferably, including a letter from the City of Boston regarding its

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99 Eversource corrected the errors in its assessment of the number of substations abutting recreational spaces through the submission of a revised assessment (see RR-EFSB-66).

position) within six months of this Final Decision, and prior to the commencement of any construction on the City Parcel.

Given the implementation of the mitigation measures proposed by the Company, the Siting Board finds that the land use impacts of the Project along the Primary Route would be minimized.

2. Traffic

e. Company Description

i. Primary Route

Eversource stated any underground transmission line project in a dense urban area would have traffic impacts, but that the impacts from the Project would be temporary and confined to the construction period (Exh. EV-2, at 5-135; 5-225; Company Reply Brief at 65). The Company recognizes that the Project route is heavily traveled and includes an elevated level of truck traffic (Exh. Jacobs-4; Tr. 11, at 1925). The Company stated that it would schedule Project construction work to avoid peak traffic hours and that it would comply with any municipal requirements regarding work hour restrictions (Exhs. EFSB-T-2(S-1); EFSB-T-5).

Based on weekday traffic counts for all vehicles, the Company concluded that peak traffic hours along the Primary Route generally reflect typical commuting patterns, with peaks from 7:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m., with a number of exceptions (Exh. EFSB-T-2(S-2)(1)).[100,101] The lowest vehicular traffic counts on weekdays occurred approximately from 6:00 p.m. to 6:00 a.m. (id.). With respect specifically to truck traffic, the traffic counts showed that truck traffic generally peaked between the hours of 9:00 a.m. to 3:00 p.m., and did not coincide with commuter traffic peaks (id.; Tr. 11, at 1935-1936). The Company noted that the highest daily truck traffic volumes along the Primary Route were on

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100 The Company measured traffic counts using an automatic traffic recorder at 21 roadway segments in January and February 2016 (Exh. EFSB-T-2(S-2)(1) at 1).

101 Based on the traffic counts for all vehicles, the peak hours in the vicinity of East Eagle Street are 7:00 a.m. to 8:00 a.m. and 3:00 p.m. to 5:00 p.m. (Exh. EFSB-T-2(S-1)(2); Tr. 10, at 1726).

Alford Street, Dexter Street, Robins Street, Beacham Street, Williams Street, and Marginal Street, with the highest daily amount (2,541) recorded on Beacham Street west of Behan Street (Exh. EFSB-T-2(S-1)(1).

The Company stated that it would maintain a minimum of one lane of alternating traffic during construction on most roadways (Exhs. EFSB-T-5; EFSB-T-7; Jacobs-3). However, some select activities or limited portions of work could potentially require temporary closure and detour of a Project roadway (Exhs. EFSB-T-5; EFSB-T-7; Jacobs-8). The Company anticipated that in areas with typical trenching, an eleven-foot wide work zone would be required; in areas with deep excavation to avoid existing utilities or at some intersections, an 18-foot wide work zone would be required (Exh. EFSB-T-8). For areas where vaults would be installed, or where trenchless construction becomes necessary,[102] a 20-foot wide work zone would be necessary (id.). The Company indicated that provision of an 11-foot travel lane is generally required, but that for roads with heavy truck traffic it would maintain a 12-foot minimum (Tr. 10, at 1715).

The Company would use steel plates to span open trenches for abutters requiring 24-hour access, and all open trenches would be plated after every work period to provide continual access during non-construction hours; the Company stated it could also provide temporary access by removing curbs or Jersey barriers (Exh. CF-29; Tr. 10, at 1761-1762).[103] The Company stated that in order to minimize impacts to abutters, it would deliver materials and equipment during off-peak traffic hours (Exhs. EFSB-T-3; Jacobs-3). Further, the Company stated it would require that the contractor remove construction equipment from the roadways at the end of a working shift to open up all possible lanes so as not to impede traffic (Tr. 6, at 1030; Tr. 10, at 1762).

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102 Trenchless crossings may be warranted due to utility density or unanticipated subsurface conditions; these conditions may be revealed as engineering advances or once construction is underway (Exh. EFSB-T-17; Tr. 3, at 533; Tr. 10, at 1746-1747).

103 For the portion of Beacham and Williams Streets (between Robin Street in Everett to Spruce Street in Chelsea), the Company identified 20 parcels, containing 30 businesses which are dependent upon these streets as their sole point of ingress/egress from their property (RR-VRT-4).

During this proceeding, the Company submitted a draft construction staging plan for the Mystic-East Eagle Primary Route (RR-VRT-7(1)). The Company's construction staging plan uses a survey base map that has been overlain by an aerial photograph of the route that shows the conduit line and manhole locations (Exh. EFSB-T-1; Tr. 10, at 1695-1696**).** The staging plan is used to evaluate the approximate amount of space needed for a work zone given the available roadway width and determines potential traffic options such as alternating traffic, two-way traffic, and street closures (Tr. 10, at 1696). The Company noted that it would develop the final construction staging plan based on input from stakeholders and those plans would form the basis for the development of temporary traffic control plans, as part of the street opening permit process (id. at 1689, 1705-1706; Company Reply Brief at 68). The Company stated that the staging plans would be reviewed by the cities of Chelsea, Everett and Boston, as well as impacted stakeholders along the Project route (Exhs. EFSB-T-3; Jacobs-3).

In addition, the Company stated that it would work with the municipalities, individual abutters, and business groups to develop and implement a traffic management plan ("TMP") to minimize traffic disruption and delay (Exhs. EV-2, at 5-252**;** EFSB-T-2(S-1)).[104] The TMP would be submitted for review and approval by Chelsea, Everett and Boston officials prior to construction (Exhs. EFSB-T-4; EFSB-T-14). The Company explained that the final TMP, including number of work crews, work hours and traffic control measures would be dictated by the municipalities as part of the street opening permit process (Exh. EFSB-T-14; Company Brief at 115).

The Company maintained that nighttime or weekend work is best implemented where a segment of a route typically experiences high traffic volumes or congestion during the day, where the adjacent land uses are primarily industrial or commercial, and where the municipality

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[104] The Project's TMP is the overall plan that specifies allowable and negotiated work hours within or outside of the public way, construction vehicle routing (if applicable), contractor staging areas for equipment and materials, sequence of construction, and any limitations on operations (Exh. EFSB-T-14). The TMP also includes public outreach for traffic management, as well as the temporary traffic control plans developed as part of the design and roadway permitting process to be implemented by the contractor (id.).

or agency that controls the road directs the Company to do nighttime construction (Tr. 10, at 1698-1700). The Company acknowledged that these three criteria apply to the segment of the Primary Route from Route 99 through Williams and Spruce Streets (id.).

Parking prohibitions would be implemented within the active construction zone and residents would be notified by flyers and doorhangers; however, the Company does not propose to provide alternative parking options (Exh. EFSB-T-10). The Company stated that staging plans, which include construction worker parking, have not yet been developed, and would be the responsibility of the contractor (Exh. EFSB-LU-12). The Company stated that the contractor would be required to provide parking for its workers that would not impact residential or business parking areas (Exh. EFSB-T-11).[105]

The Company met with the Everett, Chelsea, and Boston representatives to present the draft construction staging plan (RR-EFSB-68; RR-EFSB-68(S-1); RR-EFSB-70). The City of Everett recommended that the Company: (1) conduct work between 6:00 p.m. and 3:00 a.m. in non-residential locations to accommodate higher daytime trucking traffic volumes on (a) Dexter Street, (b) Robin Street from Dexter Street to Lynde Street, (c) Robin Street from Courtland Street to Beacham Street, and (d) Beacham Street from Robin Street to the Everett/Chelsea city line; (2) conduct work between 7:00 a.m. and. 3:00 p.m. on Robin Street from Lynde Street to Courtland Street, using alternating traffic for ductbank construction; (3) set the manhole on Robin Street near the Lynde Street intersection from 6:00 p.m. and 3:00 a.m. with work continuing to 3:00 p.m. to complete installation; and (4) subject to consultation with and agreement by the City of Everett, conduct work all hours on weekends, if necessary to expedite or recover schedule slippage (RR-EFSB-68(S-1)). In addition to the above scheduling, the City of Everett noted that the Company would be expected to provide safe bicycle passage during construction (RR-EFSB-68). The City of Everett does not have a formal winter moratorium, and allows work during the winter on a case-by-case basis (RR-EFSB-29).

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105 Mystic Substation and Chelsea Substation do not have areas available for construction worker parking or staging materials or equipment for transmission line construction (Exh. EFSB-T-19).

The Company reported that the City of Chelsea requested that work on Beacham Street and Williams Street from the Everett line to Spruce Street should be conducted during nighttime hours, after 6:00 p.m. (Tr. 10, at 1700-1701). With regard to Williams Street and Marginal Street from Spruce Street to Shawmut Street, the City of Chelsea recommended that construction occur during the day due to the residential nature of the area, and nighttime construction on Marginal Street from Shawmut Street to Willow Street (id. at 1700-1701, 1783). Chelsea officials indicated that the specific daytime hours would be determined as the Project is scheduled, and that further, some weekend work might be needed due to access constraints, such as in the vicinity of the Chelsea Courthouse (id. at 1700-1701, 1708). The Company indicated that the City of Chelsea does not have a formal winter moratorium and reviews street construction in the winter on a case-by-case basis; generally allowing it to the extent it can be managed in a way that does not interfere with management of snow (id. at 1709; RR-EFSB-29).

Portions of the Project located in the City of Boston are not contiguous and consist of roadways near Mystic Station (Alford Street) and the proposed East Eagle Substation (Exh. EV-2, at Fig. 1-1). The City of Boston recommended: (1) work on roadways in and around the East Eagle Street neighborhood be conducted between 9:30 a.m. to 3:30 p.m. Monday through Friday; (2) all work on Alford Street be conducted at night, from 7:00 p.m. to 6:00 a.m., and be coordinated with any work by Wynn Casino;[106] (3) work zones be limited to 150 feet maximum; and (4) that the Company prepare site-specific Temporary Traffic Control Plans for work on Alford Street and all manhole locations, and that all other work areas utilize typical traffic management details (Exh. EFSB-RR-70(1)). The City of Boston's winter moratorium on

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106 Eversource met with Wynn Casino to discuss coordinating the proposed Project and the casino project in Everett, with focus on the electrical duct work proposed for Alford, Dexter, and Robin Streets, which are located in Boston and Everett (Exh. EFSB-G-18(1)). Wynn's work includes adding turning lanes to Alford Street and full depth reconstruction of Dexter and Robin Streets, which includes street widening (id.). Wynn anticipates up to 2,000 workers per day at the casino construction site; and is considering all transportation modes (including barge, shuttle bus, train) to transport equipment and workers to the site (id.). Eversource and Wynn representatives agreed to coordinate respective construction activities (id.; Tr. 6, at 1021).

construction is in place from November 15 through April 15; a special permit is required to work during the moratorium (RR-EFSB-29).

The Company stated that it would be appropriate to notify residents and businesses 30 days prior to the start of construction with the intention of relaying intended construction start dates (Tr. 11, at 1959-1961). Further, once construction has begun, the Company would typically provide an update twice per month at most (id. at 1961). Also, Eversource stated that it has developed a website to provide up-to-date information on construction scheduling, road openings, and traffic around the Project; the Company would also provide a weekly construction schedule to each city, which could be published on their respective websites (Exh. EFSB-G-7).

i. Noticed Alternative Route

The Noticed Alternative Route for the East-Eagle Mystic Line is approximately 3.6 miles long versus 3.2 miles for the Primary Route (Exh. EV-2, at 5-136, 5-138). The Company stated that approximately 2.9 miles of this route is located along moderate to high traffic volume roadways, three of which are high volume – Revere Beach Parkway (Route 16), Broadway in Everett, and Second Street in Everett and Chelsea (id. at 5-138, 5-139). The Company asserted that, based on field observations, this route appears to experience a higher level of rush hour congestion than the Primary Route (id. at 5-138). The Company stated that historical MassDOT data collected along both routes show that there has been a higher volume of traffic along the portion of the Noticed Alternative Route from Mystic Station to Spruce Street, which travels along Second Street to Route 16, Broadway, and Alford Street to Mystic Station, compared to the Primary Route portion from Mystic Station to Spruce Street (Tr. 12, at 1983). Specifically, the Company pointed to the high volumes on Broadway (approximately 40,000 cars per day), and noted that Second Street from Spruce Street to Route 16, had slightly lower traffic counts versus the Beacham and Williams Street sections of the Primary Route, but that Robin and Dexter Streets had significantly lower traffic counts (id. at 1983-1984). The Hybrid A/B Route would also follow a portion of the Noticed Alternative Route, along Willow Avenue, Marginal Street, and Williams Street to Spruce Street (Exh. EV-2, Fig. 4-5).

The Company compared the portion of the Primary Route with the portion of the Noticed Alternative Route and Hybrid A/B Routes, traveling along different streets between Spruce Street and Mystic Station (Tr. 12, at 1985).[107] Similar to the Primary Route, the majority of the streets the Noticed Alternative and Hybrid A/B Routes travels on between Spruce Street and Mystic Station are also industrial and populated with truck traffic (Exh. EV-2, at 5-138, 5-139).

Based on its shorter length, fewer miles of narrow roadways and roadways with MBTA bus service, and fewer miles of roadways with high potential for congestion, the Company asserted that the Primary Route is preferable to the Noticed Alternative Route for the Mystic-East Eagle Line (id. at 5-140; RR-VRT-2). Further, given that the only activity associated with the installation of the Primary Route for the East Eagle-Chelsea Line would involve cable pulling and splicing at existing manholes versus in-street excavation for the Noticed Alternative Route, the Company asserted that the Primary Route is preferable to the Noticed Alternative Route for the East Eagle-Chelsea Line (Exh. EV-5-236R).

f. Positions of the Parties

i. Jacobs

Jacobs notes that Eversource did not conduct its traffic study of the Primary Route until one year after it filed its Petition, and conducted no traffic study of any alternative route (Tr. 3, at 495-496; Jacobs Reply Brief at 4). Further, Jacobs asserts that the MassDOT traffic counts presented by the Company regarding the Noticed Alternative/Hybrid A/B Route are over ten years old and not reliable (Tr. 12, at 1986). Jacobs notes that her property, like numerous other businesses in the vicinity, have Williams or Beacham Streets as their sole access, and further, that these streets provide critical access for truck and trailer traffic serving these businesses (Tr. 11, at 1857-1859; Jacobs Reply Brief at 6). Jacobs asserts that the obstruction of even one lane would limit property ingress and egress, and the lack of alternatives to access from Williams and Beacham Streets makes the Primary Route a particularly poor choice for Eversource road

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[107] These portions have 25 housing units versus 145 housing units, respectively, and 95 businesses versus 135 businesses, respectively (Tr. 12, at 1985).

work (Tr. 11, at 1861-1864; Jacobs Reply Brief at 6).[108] Jacobs cites testimony during hearings that described considerable traffic queuing with gridlock extending down Beacham and Williams Streets to the Tobin Bridge (Tr. 11, at 1838-1841, 1855-1856; Jacobs Reply Brief at 7). Specifically, on a number of occasions she directly observed the heaviest traffic from 4:30 a.m. (the time she arrived on-site) to 10:00 a.m., and steady truck traffic thereafter (Tr. 11, at 1841; Exh. EFSB-VRT-1). Further, Jacobs maintains that tractor trailer truck drivers often obstruct two lanes of traffic while backing their vehicles into business entrances (Tr. 11, at 1848).

Jacobs also notes that in conversations with area business owners, not one had heard from Eversource with regard to the proposed Project (id. at 1860). Jacobs asserts that notification of only property owners is an inadequate outreach method, that residents and lessees should also be notified, and that in-person discussion with the managers of businesses would be productive (id. at 1902-1904).

Jacobs concludes that the Project should not be allowed to use a route along Beacham and Williams Streets because some businesses require 24-hour access and only have a single point of access to their properties (Exh. EFSB-VRT-1). Jacobs argues that if the proposed Project is approved, such approval should be subject to conditions included in Eversource's TMP and Traffic Staging Plan (Exh. EFSB-VRT-1(d); Jacobs Brief at 8 to 11).[109] In addition, Jacobs

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[108] As an example of the type of business and related truck traffic on Beacham and Williams Streets, Mr. George Markos, owner of Yell-O-Grow Corporation, testified about his company on Beacham Street in Everett, and supported Jacobs' testimony about potential traffic disruption (Tr. 11, at 1802-1830). Yell-O-Grow is a food distributor with 100 employees (40 in the Everett facility), with both its own fleet of trucks entering and existing the facility, as well as outside deliveries to the facility (id. at 1802-1804). Mr. Markos stated that the deliveries occur Monday through Saturday between 4:00 a.m. to 2:30 p.m., with the period of 4:00 a.m. to 6:00 a.m. typically seeing 40 customer pick-ups and deliveries, using primarily 48- or 53-foot trailers (with an additional 15-foot cab/tractor) (id. at 1804-1806). Mr. Markos stated that the traffic queues up in both directions, from Beacham Street and from Williams/Marginal Streets (id. at 1817).

[109] Five businesses on Beacham Street and Williams Street presented testimony on the construction periods that would have the least negative impact on their business operations: (1) Eagle Diner (390 Beacham Street, Chelsea), 4:00 p.m. to 5:00 a.m.; (2) C&W Services (219 Williams Street, Chelsea), 7:00 p.m. to 5:00 a.m. when there is

asserts that all access roads leading to Beacham and Williams Streets must be kept clear for trucks and cars to prevent backups on Beacham and Williams Streets, with the most critical access roads being Spruce Street and Chestnut Street (Exh. EFSB-VRT-1(b)). Jacobs recommends the following conditions (Jacobs Brief at 8 to 11):

1. No winter construction.

2. Only night work, as the period of least negative impact would be if construction on Williams and Beacham Streets is limited to the period from 7:00 p.m. to 2:30 a.m. To permit time for set up and take down each evening, no work by Eversource or its contractors should be permitted prior to 6:30 p.m. or after 3:00 a.m.

3. Eversource should be required to ensure 24-hour emergency access for all abutting businesses.

4. When businesses along the Primary Route are open, two-way traffic (traffic in both directions) should not be blocked, narrowed or held up so that the businesses have uninterrupted access to their buildings.

5. In order to be kept appraised of all relevant developments, Eversource should be required to advise Jacobs and the Siting Board immediately following any meetings with the cities of Chelsea and Everett, the Wynn Casino, or business or community groups in either city, regarding the Project.

6. No staging on Williams or Beacham Streets, or on the Cross Streets. Due to road width and inadequate shoulders, construction materials and equipment, and workers' vehicles, must not be parked or stored on Williams or Beacham Streets, or on the cross streets. In addition, Eversource should be required to investigate alternatives to flatbed delivery of large items to prevent blockage of Williams and Beacham Streets.

7. Eversource should be required to inspect the construction site daily to ensure that all steel plating over open trench areas is in the proper location.

8. Eversource should be required to contact all abutters along the

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no risk of snow, no construction during the winter, 24-hour emergency access to site; (3) Baldor Boston (215 Williams Street, Chelsea), 7:00 p.m. to 2:30 a.m., 24-hour emergency access to site; (4) Ruma Fruit and Produce (210 Beacham Street, Everett), 6:00 p.m. to 6:00 a.m.; and (5) DG's Trading (219 Williams Street, Chelsea), 6:00 p.m. to 6:00 a.m. (Exh. EFSB-VRT-1(a)).

construction route (not just landowners): (1) before contractor bid packages are finalized; (2) a second time, not less than 30 days before construction is to begin to ensure that all businesses are aware of the Project and its timing; and (3) a third time, not more than 7 days before construction is to begin in the vicinity, to ensure that all businesses are aware of the precise dates and times when work will be taking place along Williams and Beacham Streets in the vicinity of their businesses.

9. Upon completion of the Project, Eversource should be required to repave Williams and Beacham Streets, curb-to-curb, with at least one foot of coverage over all buried utilities, using blacktop appropriate for heavy truck and trailer traffic.

10. There should be provisions in the Siting Board's Order that ensure that Eversource and its contractors abide by their promises and comply with all conditions imposed by the Board.

ii. Company Response

The Company asserts that the conditions requested by Jacobs are, for the most part, overly prescriptive and unnecessary, and opposes their inclusion in the Final Decision, in whole or in part (Company Reply Brief at 69). The Company asserts that because it is committed to working with municipal officials and abutters in developing its TMP, some proposed conditions – such as no winter construction, only night work, two way traffic access, and no staging on Williams and Beacham Streets or cross streets – could conflict with the final TMP and street opening permits (id. at 69 to 73). Furthermore, the Company argues that the TMP will address issues of 24-hour access and daily inspections (id. at 70, 72). The Company opposes conditions to: (1) investigate alternative delivery of large items as it asserts it would use appropriately sized-vehicles during approved work hours; (2) repave Williams and Beacham Street curb-to-curb as it would repair or replace pavement upon request of the applicable public works department pursuant to Department of Public Utilities street restoration standards; and (3) impose a monetary penalty for violating Siting Board conditions as well as TMP and traffic staging plan conditions as the existing statutory framework already allows the Board to exercise control over the Company to ensure that Eversource and its contractors abide by its promises and comply with conditions (id. at 72, 74-75). Finally, the Company complains that it would be burdensome to advise Jacobs and the Siting Board immediately after meeting with Chelsea, Everett, or Wynn and other business groups, but that it would be sufficient to rely on the Company's community outreach plan (id. at 72). Also, the Company asserts that it is not

necessary to be directed to contact all abutters along the route (not just landowners) before contractor bid packages are finalized, not less than 30 days before construction is to begin, and not less than seven days before construction is to begin in the vicinity, as it typically does some variation of this request (id. at 72-73).

g. Analysis and Findings

Based on the record and the information above, construction along both the Primary and the Noticed Alternative Routes would result in significant, though temporary, traffic impacts. Both routes are through densely populated urban roadways with significant commercial and industrial development that relies on truck traffic. The portion of the Primary Route from Spruce Street to the East Eagle Substation along Marginal Street is preferable to the portion of the Noticed Alternative Route from Spruce Street and Second Street to the East Eagle Substation through the interior of Chelsea[110] due to the density of the interior streets; which no parties have disputed. Therefore, the Siting Board focuses on comparing the Spruce Street to Mystic Station portion of the Primary and Noticed Alternative Routes ("Second Street/Broadway portion") (this portion is the same location for the Noticed Alternative and the Hybrid A/B Routes).

The Second Street/Broadway portion of the Noticed Alternative and Hybrid A/B Routes has a significant number of residences along highly trafficked roadways, making the option of nighttime construction undesirable. The Primary Route has fewer residential abutters and therefore construction during the nighttime may mitigate traffic impacts for abutters. While it is difficult to directly compare the impact of construction on areas that are both populated with businesses that rely on truck traffic, the Noticed Alternative Route and Hybrid A/B Route lack reasonable mitigation options, such as nighttime construction, as compared with the Primary Route. Therefore, on balance, the Siting Board finds that the Primary Route for the Mystic-East

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110 The Noticed Alternative Route portion referenced travels along Second Street, Chestnut Street, Third Street, and Congress Street to Willow Street, in Chelsea.

Eagle Line is comparable to the Noticed Alternative Route (and the Hybrid A/B Route) with respect to traffic.[111]

The record shows that traffic is a very significant construction impact for the Mystic-East Line due to the existing high traffic levels along densely developed urban roadways. Beacham and Williams Street business area, as well as Robin and Dexter Streets leading to this area, have extensive truck traffic, much of which consists of large tractor-trailers. As noted above, given the nature of the traffic patterns throughout Everett, Chelsea, and Boston, mitigation of traffic impacts of in-road excavation is appropriate and necessary.

The host municipalities have jurisdiction over street opening permits and would be active participants in the development of the TMP, including construction work hours and traffic control measures. The Company has been in contact with the cities of Everett, Chelsea, and Boston, and has received specific requests for scheduling from Everett and Boston, and a more generalized directive from Chelsea. Nonetheless, at this point in project development the TMP is not yet available. Therefore, based on the abundance of concerns of area businesses relating to the ingress and egress of oversized trucks, as well as the strong likelihood that truck queuing would be exacerbated, the Siting Board considers it appropriate to identify targeted mitigation in advance and for the Company to include these mitigation measures in the TMP.

As the record shows, Jacobs and other business owners have provided a comprehensive description of the workings of the Beacham and William Street business area with regard to wholesale operations and deliveries. The record demonstrates that the ability of these Everett and Chelsea businesses to operate is highly dependent on unimpeded access of trucks to each business's property. Therefore, it is especially important to rely on scheduling, coordinating, and communication between the Company (and its contractors), the cities, and the abutters to mitigate traffic impacts.

The Siting Board recognizes the concerns raised by Jacobs and the need to provide conditions to address a number of these concerns. First, as noted above, Everett and Chelsea

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[111] The East Eagle-Chelsea portion of the Primary Route consists mostly of existing conduit, greatly reducing the traffic impacts associated with conduit installation.

have, for the most part, provided the Company with their preferred construction schedules. The Siting Board notes that the hours recommended by Everett generally address the scheduling concerns of Jacobs (construction from 6:00 p.m. to 3:00 a.m.) by avoiding construction during the majority of truck delivery times. The City of Chelsea recommended that construction on Beacham and William Street to Spruce Street be conducted during nighttime hours beginning at 6:00 p.m., but did not provide an end time. Given the integrated nature of the Everett and Chelsea wholesale business district along both Beacham and Williams Street, an appropriate time to end construction along Beacham and Williams Streets in both Everett and Chelsea is 3:00 a.m.

The cities also prescribed construction during specific times at specific locations in order to minimize traffic impacts. Based on this input, the Siting Board directs the Company to limit construction to the following hours: (1) 6:00 p.m. to 3:00 a.m. Monday through Saturday on Dexter Street, Robin Street (with the exception of Lynde to Courtland where daytime construction is to be performed), Beacham Street and Williams Street; (2) daytime construction from 7:00 a.m. to 6:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. Saturday for Williams Street and Marginal Street from Spruce Street to Shawmut Street, with the exception of peak travel periods (see SectionV.C.6, below); (3) nighttime construction from Shawmut Street to Willow Street, hours to be determined by the City of Chelsea; (4) 9:30 a.m. to 3:30 p.m. Monday through Friday on roadways in and around the East Eagle Street neighborhood; and (5) 7:00 p.m. to 6:00 a.m. on Alford Street, which must be coordinated with any work by Wynn Casino.

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 Company is directed 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 approval from the Siting Board and shall provide the relevant municipality with a copy of any such request.

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 Board. The Company shall also send a copy to the Siting Board, within 72 hours of receipt, of any authorization for an extension of work hours by a municipality. 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 municipality, work that continues past such allowed hours, and must submit such record to the Board within 90 days of Project completion.

The Company has stated that it would endeavor to provide 24-hour emergency access and would remove construction equipment from all roadways at the end of each construction shift. Nonetheless, given the need for unfettered ingress and egress to all businesses and the densely populated streets throughout the Project area, the Siting Board directs the Company, as requested by Jacobs, to provide 24-hour emergency access to all abutting businesses. Further, the Siting Board directs the Company to provide two-way traffic access to the extent practicable, such that when businesses along the Primary Route are open for business, two-way traffic is not blocked.

The Company has not yet developed a staging plan for construction equipment storage and construction worker parking, as the Company notes it is the responsibility of the contractor. The Siting Board directs the Company to submit to the Siting Board a copy of the staging plan prior to commencement of Project construction. The staging plan should include a prohibition on equipment storage on roadways at the end of each work shift, and details of where construction equipment would be stored and construction workers would park for the duration of Project construction.

With regard to winter construction, the Siting Board agrees that during periods of snow and ice, construction could cause hindrance of snow plow operations or damage to snow plows by metal plates, constricted travel lanes, and need for snow removal. However, only Boston has a specified winter moratorium for in-road construction, although interim exceptions during favorable winter weather are permissible. The Siting Board directs the Company, during November 15 through April 15 to confirm with the cities on a weekly basis to receive approval to conduct work during this period.

The record shows that the Company would have an environmental monitor and construction supervisor at its construction site (see Section V.C.3, below). Daily inspections should already be a component of the Company's construction procedures given the nature of the Project. Given the importance of ingress and egress along the route, the Siting Board directs the Company to provide a twice-monthly report to all parties to this proceeding itemizing any and all complaints about construction practices and procedures, including proper location of steel plating, and the resolution of such items.

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 issues. Because the Project requires approximately 3.2 miles of in-street construction through three densely populated cities, 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 Everett, Chelsea, and Boston, to develop a separate, comprehensive outreach plan for the Project that incorporates the conditions listed above. 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 of upcoming construction.

The Siting Board also directs the Company to submit the final TMP to the Board and all other parties no less than one month prior to the commencement of construction, and to publish the TMP on the Company's Project website.

As discussed, communication and coordination are crucial to ensuring that all of the various abutters, both business and residential, are informed of all aspects of the Project. Given that some of the affected businesses and residents are likely not property owners, the Siting Board directs that any notifications include all abutting landowners and lessees. In addition, the Company shall notify all abutting landowners and lessees not less than 30 days before Project

construction begins, and again not less than seven days before construction is scheduled to begin directly adjacent to the affected property.

Finally, to mitigate Project impacts consistent with requests by the City of Chelsea and Jacobs, the Siting Board directs the Company to provide curb-to-curb repaving on all streets along the Mystic-East Eagle route following completion of the Mystic-East Eagle Line.

With the implementation of the above conditions, the Siting Board finds that traffic impacts from construction and operation of the Project along the Primary Route would be minimized.

3. Hazardous Waste and Safety

a. Company Description

The Company indicated that construction and operation of the Project would involve certain substances with the potential for negative environmental impacts if leaked or spilled, including oils, greases, equipment fuel, mineral oil dielectric fluid ("MODF"), and sulfuric acid in batteries (Exhs. EFSB-S-4; EFSB-S-5). Eversource stated that in the event that one of these substances is released into the environment, the Company's spill response plan would be activated immediately, and the spilled material would be cleaned and disposed of (Exhs. EFSB-S-3; EFSB-S-4).

Additionally, the Company stated that trench excavation in urban areas comes with an associated risk of encountering contaminated soils (Exh. EFSB-S-6). To assess this risk, Eversource collected information on active listed MassDEP MCP sites within 500 feet of the Primary and Noticed Alternative Routes (id.; Exh. EV-2, at 5-142). Eversource identified 55 active MCP sites along both the Primary and Noticed Alternative Routes for the Mystic-East Eagle Line (Exhs. EV-2, at 5-142; EFSB-S-6). Eighteen active MCP sites were identified along the Primary Route for the East Eagle-Chelsea Line, compared to 28 along the Noticed Alternative Route; however, as previously noted, no construction activities requiring soil disturbance would be needed from the Chelsea Creek Crossing to the Chelsea Substation if the Primary Route were selected for this line (Exhs. EV-2, at 5-230; EFSB-S-6). Eversource stated that if contaminated soils are encountered during Project construction, they would be managed

according to the utility-related abatement measure ("URAM") provisions of the MCP, which describes how contaminated soils must be handled during construction of underground utilities (Exh. EFSB-S-6; Tr. 6, at 1094-1095). A Licensed Site Professional ("LSP") would be responsible for ensuring the Company's contractor complies with any conditions contained in the URAM (Exh. EFSB-S-6; Tr. 6, at 1094-1095; Company Reply Brief at 71).

Eversource stated that solid waste generated during construction of the New Lines and the proposed East Eagle Substation would include packaging waste as well as demolition-type debris (Exh. EFSB-S-8). Solid waste would be recycled or disposed of in accordance with applicable regulations and would not be left on site (id.; Tr. 6, at 1090-1091).

The Company indicated that throughout Project construction, an environmental monitor would be employed to enforce compliance with all federal, state and local permitting requirements and Eversource policies (Exh. EV-2, at 5-251). Additionally, Eversource would require its construction contractor to designate a construction supervisor, or equivalent, who will be responsible for daily inspections and compliance with permit requirements and Eversource policies (id.). The Company's contractor would be required to submit a Project Safety Plan that meets Eversource's safety requirements, as well as those established by the U.S. Occupational Safety and Health Administration and other regulatory agencies (Exh. EFSB-S-1). The Company stated that the safety of workers and the general public would be protected during Project construction through the use of police details and work zone demarcation in public ways, as well as by fencing around the Substation site (id.).

With respect to the ongoing operation of the East Eagle Substation, Eversource stated that each of the proposed transformers would contain approximately 10,000 gallons of MODF, and, in the event of a release, any MODF would be captured within a concrete secondary containment structure under the transformers (Exh. EFSB-S-9). The Company proposed three linked containment sumps with a total combined capacity of 17,000 gallons for this purpose (id.). The containment sumps would utilize a system of imbiber bead drains, which would allow water to pass, but would expand to seal shut should the beads come into contact with MODF (id.). Additionally, Eversource stated that batteries containing sulfuric acid would be used at the

Substation, and committed to installing a spill containment and acid neutralization system for the battery area (Exh. EFSB-S-5).

Eversource stated that potential safety risks associated with the planned future development of a soccer field proximate to the Substation site were taken into consideration in the design of the East Eagle Substation (Tr. 3, at 428). According to the Company, the Substation was designed to meet or exceed all National Electric Safety code requirements, including the use of climb-resistant fencing, and the installation of solid walls around all exposed live electrical equipment (id. at 428, 431; Exh. EFSB-S-1). Additionally, Eversource stated that it would install a mesh screen made from non-conductive material, over the transformer bays (Tr. 3, at 428-429; RR-EFSB-25). The Company explained that this mesh screen would have a slight pitch towards the soccer field and would serve to protect electrical equipment within the Substation from errant soccer balls, while simultaneously preventing the loss of soccer balls into the inaccessible Substation (Tr. 3, at 428-429, 431-433).

b. Positions of the Parties

ii. Jacobs

Jacobs argues that Eversource has failed to properly assess the environmental risks associated with the proposed Primary Route of the New Lines (Jacobs Brief at 3). Jacobs asserts that the soil under significant portions of Williams and Beacham Streets in Chelsea consists of filled tidelands or other landfill, and is contaminated (id., citing Exh. EFSB-Z-10(1) at 32; VRT-7; VRT-8). Jacobs argues that construction activities that would disturb this soil pose a contamination risk to food industry businesses in the area (Jacobs Brief at 6). Additionally, Jacobs argues that Eversource has not undertaken a thorough study of soil conditions along alternative route corridors so that a proper comparison of the environmental risk associated with construction of the New Lines could be made (id.). As such, Jacobs argues that the Siting Board should either reject Eversource's Petition in its entirety, or at least reject the Company's use of the Primary Route (Jacobs Reply Brief at 2-3).

Jacobs submits that in the event that the Project is approved along the Primary Route, the Company should be required to conduct a full environmental analysis of the sub-surface soil

conditions along the route prior to the issuance of contractor bid packages, and that the Company should be required to adopt appropriate environmental mitigation procedures (Jacobs Brief at 8-9). Jacobs submits that the reports resulting from such environmental analyses should be provided to Jacobs and the Siting Board as soon as they are available (id.).

iii. Channel Fish

As discussed above in Section III.C.1.b.ii, Channel Fish argues that the proposed Substation site represents an undue safety risk to the East Eagle neighborhood due to its proximity to: (1) a proposed soccer field; (2) a jet fuel depot; and (3) Channel Fish's ammonia electronic sensors and ammonia storage (CF Brief at 38-42). Channel Fish argues that because of these safety concerns the proposed Substation site is inappropriate, and should not be approved by the Siting Board (id.).

Regarding the location of the Substation site next to a planned soccer field, Channel Fish asserts that the installation of an electric Substation in an area where members of the public would congregate is antithetical to the Commonwealth's policy to protect the health and safety of its citizens (id. at 38). Channel Fish further argues that safety risks associated with the Substation are exacerbated by the Company's plans to use a shorter (12-foot) porous fence[112] – which Channel Fish asserts would be scalable – around roughly half of the Substation's perimeter, rather than continuing the at least 25-foot-tall concrete and fiberglass screening wall around the entirety of the Substation (CF Brief at id. at 40-41, citing EFSB-V-3(S-1)(1); see RR-EFSB-79(1) at 7).

c. Company Response

In response to Jacobs' concerns relative to possible existing soil contamination, Eversource states that along any route, particularly in dense urban areas, construction activities may result in the excavation of materials that have been impacted by historical releases or former

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[112] Channel Fish asserts that the fiberglass fence proposed by the Company would be similar to a chain-link fence (CF Brief at 40).

land development practices (Company Reply Brief at 65-66). Eversource reiterates that if it were to encounter contaminated soils during construction of the Project, such soil would be managed pursuant to the URAM provisions of the MCP (id. at 66). Additionally, Eversource states that it has contracted with an LSP to assist with the management of soil along the Project route (id.). Finally, Eversource states that it has performed an initial pre-characterization of soils along the Primary Route – including three soil borings along Beacham Street – and that the soil was typical for an urban setting (id. at 66-67). The Company commits to undertaking additional soil pre-characterization along the Primary Route prior to the start of construction in order to obtain additional information on subsurface contamination and to support construction planning and construction-related soil management practices (id. at 66).

As discussed in Section III.C.2, above, Eversource disagrees with Channel Fish's arguments regarding the suitability of the East Eagle Substation site (Company Reply Brief at 18). The Company maintains that the Substation is designed to create a safe environment for both electrical equipment and the surrounding neighborhood (id. at 22-23, 37). The Substation would be constructed in accordance with all applicable safety codes, and would be designed to conduct stray current (e.g., a lightning strike) to ground in a manner that would prevent any potentially hazardous arcing (id.).

Eversource argues that construction of the Project would not pose a safety risk to individuals using the adjacent soccer field, as the Company has demonstrated that EMF from the Substation would have no impact on players and spectators at the proposed soccer field, that Substation equipment would be surrounded by solid walls as well as a non-conductive covering over the transformers, and entry to the Substation property would be prevented through the installation of a 12-foot non-scalable fence (id. at 20-21; RR-EFSB-79(1) at 5). The Company maintains that there would be no way for members of the public to gain access to the Substation, and indicated that the fiberglass fence (which Channel Fish has characterized as comparatively short) would be approximately five feet taller than Company's standard substation perimeter treatment (Exhs. CF-EV-50; EFSB-V-3(S1)(1); Company Reply Brief at 21).

d. Analysis and Findings

The record shows that both the Primary and Noticed Alternative Routes traverse urban environments, and as such, there is the potential for the Company and/or its contractors to encounter subsurface contamination during trench excavation. An equal number of active MCP sites were identified along the Primary and Noticed Alternative Routes for the Mystic-East Eagle Line. Fewer active MCP sites were identified along the Primary Route of the East Eagle-Chelsea Line compared to the Noticed Alternative Route. Furthermore, due to the presence of the existing Eastern Avenue Duct Bank, no soil-disturbing activities would be required between the Chelsea Creek Crossing and the Chelsea Substation if the Primary Route were selected, which further reduces the Company's risk of encountering contaminated soils along the Primary Route. The Company's plans for hazardous material and solid waste management, and for protecting the health and safety of the public, and individuals working on the Project, would be comparable whether the Project were constructed along the Primary Route or the Noticed Alternative Route. Consequently, the Siting Board finds construction along the Primary Route is preferable to the Noticed Alternative Route with respect to potentially hazardous material impacts, and comparable with respect to solid waste and safety impacts.

If the Company were to encounter contaminated soil during Project construction, it would manage such soils in accordance with the URAM provisions of the MCP. These measures, which would be monitored by an LSP, would minimize the risk of contamination to abutting businesses and residences. The contractor would be responsible for appropriate evaluation of soil as construction proceeds; there is no indication that additional analysis of sub-surface soil conditions prior to the issuance of contractor bid packages, as requested by Jacobs, is warranted. The Siting Board directs the Company, prior to the start of Project construction, to provide the Board and all parties copies of the results from soil pre-characterization activities performed by the Company or its contractor.

With respect to the Substation site, the record shows that Eversource has designed the East Eagle Substation to protect the safety of the public through its compliance with the National Electric Safety Code, including the installation of a non-scalable barrier around the perimeter of the Substation, and grounding facilities, as well as through the installation of a non-conductive

mesh screen over the transformer bays. These measures would block members of the public from accessing the Substation site, and guard against contact of any stray soccer balls from the planned soccer field adjacent to the Substation with electrical equipment.[113]

Conformance with the National Electric Safety Code will also protect against any potential flammability risks associated with nearby land uses. Approximately 20,000 gallons of MODF would be added at the Substation as a result of the Project. Control batteries containing electrolytes with sulfuric acid would also be required. The Company would install containment systems to protect against any accidental releases of these fluids. There is nothing in the record to support a conclusion that construction of the Substation, as proposed by the Company, would pose an undue safety risk to the East Eagle Street neighborhood.

The Siting Board recognizes that the Company has proposed comprehensive mitigation, discussed above. Based on the Company's proposed mitigation, the Siting Board finds that impacts from potentially hazardous material and solid waste and potential safety impacts associated with the Project along the Primary Route would be minimized.

4. Magnetic Fields

a. Background

Electrical transmission lines operating with 60-hertz ("Hz") alternating current create a 60-Hz alternating magnetic field proportional to the current in the lines (Exh. EV-2, app. 5-7(R), at 4). Some epidemiological studies have suggested a statistical correlation between exposure to magnetic fields and childhood leukemia. Mystic Woburn at 68; Salem Cables at 83; Sithe Mystic Development, LLC, EFSB 98-8, at 86-87 (1999). However, according to a 2007 World Health Organization ("WHO") report, "the evidence for a causal relationship is limited, therefore exposure limits based upon epidemiological evidence are not recommended, but some precautionary measures are warranted." Mystic Woburn at 68; Salem Cables at 83.

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[113] The Siting Board expects that Eversource and the City of Boston will coordinate during planning and construction of the proposed soccer field.

The Company noted that the United States has no federal standards limiting occupational or residential exposure to power-frequency magnetic fields (Exh. EV-2, app. 5-7(R), at 4). The Company identified a number of advisory limits, which it stated "should not be viewed as demarcation lines between safe and dangerous levels of EMF, but rather, levels that assure safety with an adequate margin of safety to allow for uncertainties in the science" (id.). Among the cited advisory limits referenced by the Company is a power-frequency magnetic field limit of 2,000 milligauss ("mG") from the International Commission on Non-Ionizing Radiation Protection ("ICNIRP") (id., app. 5-7(R), at 5).

In past decisions, the Siting Board has recognized public concern about power-frequency magnetic fields and has encouraged the use of low cost measures that would minimize magnetic fields along transmission rights-of-way. Mystic Woburn at 68, 70-71; Salem Cables at 88. In the present case, Channel Fish raised as an issue the potential impact of 60-Hz magnetic fields at levels around 1.0 mG on sensitive equipment.

b. Company Description

The Company modeled above-ground magnetic fields from existing conditions and from the New Lines under a number of representative installation scenarios, including: a single transmission line, representing the portion of the Project between the Mystic Substation and the Chelsea Creek Crossing (Scenario 1); a single transmission line located next to the existing distribution lines, representing the portion of the Project between Chelsea Creek Crossing and Chelsea Substation (Scenario 4); and two transmission lines and eight new distribution lines, representing the portion of the Project along East Eagle Street (Scenario 6) (Exh. EV-2, app. 5-7(R), at 7-8, 11-16). The Company indicated that its modeling was performed for year 2022 peak loads, using conservative assumptions that minimize cancellation of magnetic fields by adjacent conductors (id., app. 5-7(R), at 7, 18; NSTAR-PAV-2, at 7). These three scenarios accounted for over 90 percent of the length of the New Lines installation (Exh. EFSB-MF-5). Results of the Company's magnetic field modeling for these three scenarios are shown in Table 8, below.

Table 8. Modeled Magnetic Fields Above Installed Lines for Select Installation Scenarios

Transmission Line Configuration (see text above)	Magnetic field three feet above ground surface, 2022 load levels, at maximum value and at specified distances to either side of midline of transmission line, as applicable				
	50 feet away	20 feet away	Maximum	20 feet away	50 feet away
Scenario 1	1.9 mG	7.3 mG	71.3 mG	7.3 mG	1.9 mG
Scenario 4	1.7 mG	7.3 mG	54.3 mG	9.0 mG	0.7 mG
Scenario 6	3.5 mG	36.1 mG	51.8 mG	9.8 mG	1.6 mG

Source: Exh. EV-2, app. 5-7(R), at 11-16, 22.

The Company indicated that the maximum modeled magnetic field levels associated with the New Lines would occur above the portion of the Mystic-East Eagle Line located between the Mystic Substation and the Chelsea Creek Crossing (Scenario 1) (Exh. EV-2, app. 5-7(R), at 11-16, 22). Magnetic field levels here would reach 71.3 mG above the cables, dropping to 7.3 mG at a distance of 20 feet from the midline of the installation (id.).

In addition, the Company modeled magnetic fields above manholes vaults, where conductors would be deeper in the earth but more widely separated, as well as magnetic fields around the proposed East Eagle Street Substation (id., app. 5-7(R), at 7-8, 17-21; EFSB-MF-4; RR-EFSB-35). Eversource projected a maximum magnetic field of 148 mG above manhole vaults, with field strength decreasing to 26 mG at a distance of 20 feet (Exh. EFSB-MF-4(1)). Maps provided by the Company indicate that only one of the manhole vaults is located in a residential area (Exh. EFSB-CM-4(1); RR-EFSB-48).

With respect to magnetic fields at the East Eagle Substation, the Company's modeling showed that the maximum modeled magnetic field (160.2 mG) would occur within the Substation fenceline, above a point where the distribution and transmission lines intersect (Exh. EV-2, app. 5-7(R), at 21, fig. 4.3 notes). Outside of the Substation fenceline, magnetic field levels would drop significantly (id., app. 5-7(R), at 20, 21). The highest modeled magnetic

field at the closest wall of the neighboring Channel Fish building was slightly above 1.0 mG (Exhs. NSTAR-PAV-2, at 3; EFSB-MF-7(1)(R-1)).[114]

The Company noted that all calculated magnetic field values outside the fenceline of the proposed East Eagle Substation, including those predicted for the Substation access driveway and East Eagle Street, were below the value of 85 mG cited as a reference point in prior Siting Board decisions (Exh. EV-2, app. 5-7(R), at 22).[115] Overall, the Company concluded that "there is no expectation of adverse health effects due to the [magnetic field] impact from the proposed Eversource project" (id.).

Eversource stated that underground placement of Project transmission and distribution lines mitigates magnetic fields (Exh. EFSB-MF-9). The Company noted as well that the close spacing of the three phases of current in an underground installation creates a cancellation effect that diminishes the magnetic field around the cable, and enhances the diminution of field strength with distance (id.; Exhs. EFSB-MF-15; CF-EV-38). The Company maintained that additional measures to reduce magnetic field impacts, such as conveying the power at a higher

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114 As previously discussed, the Company indicated that beyond equipment proposed as part of the Project, the Substation site could accommodate a third transformer – which could be required for future load growth (RR-EFSB-35). The Company indicated that addition of a third transformer would increase magnetic fields, but that the Project's magnetic field at the edge of the Channel Fish building would remain below 5 mG (id.; RR-EFSB-35(1); RR-EFSB-35(1)(S-1)).

115 In its Petition, Eversource actually characterized the Siting Board's 85 mG reference point as a "guideline value," citing to GSRP (Exh. EV-2, app. 5-7(R), at 22). That 2010 decision relates a suggestion by petitioner Western Massachusetts Electric Company, a predecessor to Eversource, that levels below 85 mG are by precedent acceptable to the Siting Board. GSRP at 87. The Siting Board decision goes on to state that, contrary to that suggestion, the Board has *not* found "that by presenting an edge of right-or-way 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," adding (parenthetically) that previously accepted magnetic field levels are not a standard limiting acceptable impacts, and do not provide the principal basis for Siting Board evaluation of magnetic fields. GSRP at 87. Thus, while the figure of 85 mG may reasonably be cited by a party as a reference point, the GSRP Board decision does not support the Company's characterization of 85 mG as a Siting Board guideline.

voltage or adding ferromagnetic shielding, are not necessary for this Project, and that the underground placement of the New Lines provides sufficient mitigation (Exh. EFSB-MF-9).

Eversource indicated that magnetic fields created by the transmission lines would typically be the same on the Primary and the Noticed Alternative Routes at equivalent distances from the transmission lines because the typical duct configuration would be the same and current on the lines would be the same (Exhs. EV-1, at 6-30; EFSB-MF-1). In its consideration of land use, the Company stated that the Primary Route for the Mystic-East Eagle Line passes by 437 fewer residences, 19 fewer commercial/industrial buildings, and five fewer sensitive receptors than the Noticed Alternative Route (RR-EFSB-36). For the Primary Route for the East Eagle Street-Chelsea Line, the Company stated that the Primary Route passes approximately 136 fewer residences, 32 more commercial/industrial buildings, and seven fewer sensitive receptors than the Noticed Alternative Route (Exh. EV-2, at 5-230).

c. Positions of the Parties

Channel Fish operates a fish processing business adjacent to the Project (Exh. CF-8, at 1). The business consists of receiving, processing, freezing, salting, packing and shipping fish for human consumption, pet food, animal feed and bait (id. at 1-2). Channel Fish stated that its business operations are dependent on the continuous, uninterrupted functioning of electrical equipment, including a magnetic anomaly detector, a nuclear magnetic resonance device, and a refrigeration system (id. at 2). Its customers require fish that is 100 percent free of any foreign substance, and Channel Fish follows strict requirements for the fat and moisture content of its products (id. at 3). Channel Fish stated that improper functioning of its electrical devices would result in imperfections in the product delivered to customers, jeopardizing customer contracts and violating laws such as the Federal Food, Drug and Cosmetic Act (id. at 2-3; Channel Fish Brief at 46).

Channel Fish consultant Donald Haes, PhD, stated that it is essential to Channel Fish's business that it identify the presence of any foreign contaminants such as hooks, leader lines, and sinkers in fish (Exh. CF-9, exh. C, at 1). Dr. Haes stated that he measured existing 60-Hz magnetic fields at the Channel Fish facility and reported that at most locations, field strengths

were less than 8 mG, with a maximum of 250 mG near the building's main electrical supply (Exh. CF-9, exh. B, at 1). Dr. Haes reported a maximum magnetic field strength of 5 mG near the Channel Fish metal detector (id.).[116]

Channel Fish argues that the EMF modeling software used by Eversource has been shown to be inaccurate, and that Eversource has never validated its Substation EMF predictions with field testing (Channel Fish Brief at 49, citing Tr. 4, at 655; Channel Fish Reply Brief at 12, citing Exh. CF-2-10). Channel Fish argues that the Company failed to account for EMF frequency harmonics above the 60-Hz power system frequency (Exh. CF-9, exh. C, at 9; Channel Fish Brief at 50). Channel Fish argues that the Company failed to mathematically propagate the uncertainties associated with the predicted magnetic field values, asserting that the Company should perform a Monte Carlo analysis to obtain a distribution of expected electromagnetic interference values coincident with critical equipment at the Channel Fish facility (Exh. CF-9, exh. C, at 9). Additionally, Channel Fish asserted that Eversource needed to evaluate the potential electromagnetic interference from the addition of a third transformer at the Substation (id.).[117]

Dr. Haes asserted that magnetic fields above 2 mG present a substantial risk of adversely affecting the normal operation of unshielded sensitive equipment, citing a final environmental impact report prepared for a high-speed rail project in California (Exh. CF-9, exh. B, at 1, 2, 5).

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116 The Siting Board notes that Dr. Haes's tabulated data reflect a root mean square calculation (the square root of the arithmetic mean of the squares of a set of values) of magnetic fields strengths on three measurement axes, rather than the formula, illustrated in Dr. Haes' report, of calculating the vector sum by calculating the square root of the sum of squares [i.e., $\sqrt{((x^2+y^2+z^2)/3)} \neq \sqrt{(x^2+y^2+z^2)}$]; this substitution reduces Dr. Haes' reported magnetic field below what was measured on the strongest axis, as pointed out by Dr. Peter Valberg, witness for the Company (Exh. CF-9, exh. B, at 7, 13-19, 33; Exh. NSTAR-PAV-2, at 10).

117 Channel Fish witnesses also alleged potential problems from 60-Hz EMF interfering with broadcast radio signals and items such as key fobs (Exhs. CF-11, at 4, 8; CF Reply Brief at 12). These assertions were not accompanied by sufficient detail to distinguish the circumstances of the present case from other substations or other electrical equipment in industrial locations, and are not further evaluated here.

In addition, Dr. Haes asserted that magnetic fields from the proposed East Eagle Substation may exceed the Company's estimate (approximately 1 mG) for the Channel Fish facility by as much as a factor of ten, citing uncertainties, future Substation expansion, and 60-Hz frequency harmonics (Exh. CF-9, exh. C, at 1). He characterized the magnetic fields from the Substation as representing "an exponential increase" in Channel Fish's magnetic field exposure (id.). Dr. Haes, along with additional Channel Fish witnesses Dr. Eric Peterson and Mr. David Spako, commented similarly about potential electromagnetic interference from the Substation on product moisture content sensing equipment, as well as on sensors and valves of Channel Fish's ammonia refrigeration system (Exh. CF-11, at 3). Dr. Peterson and Mr. Spako additionally indicated a concern with radio frequency interference from power quality disturbances (Exh. CF-10, at 2-3).

d. Company Response

Eversource argues that while all projects may have theoretical concerns, such as potential magnetic field interference, "such conjecture" does not represent substantial evidence without the presence of supporting, credible facts negating the Company's expert testimony (Company Reply Brief at 41). The Company reiterates that, based on projected loads, the magnetic field at the edge of the Channel Fish building would be slightly above 1.0 mG, and magnetic fields from the Project would be lower than 1.0 mG inside the Channel Fish building (id. at 42, citing Exhs. EV-2, app. 5-7(R), at 22; EFSB-MF-7; EFSB-MF-7(1)).[118] According to the Company,

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[118] The Company argued that this modeling result is consistent with an analysis of substations and the EMF they produce by the National Institute of Environmental Health Sciences, which it quoted as concluding in 2002 that "[i]n general, the strongest EMF around the outside of a substation comes from the power lines entering and leaving the substation. The strength of the EMF from equipment within the substations, such as transformers, reactors, and capacitor banks, decreases rapidly with increasing distance. Beyond the substation fence or wall, the EMF produced by the substation equipment is typically indistinguishable from background levels" (Company Brief at 118, n.65, citing Exh. NSTAR-PAV-2, at 2-3). Also, the Company cited a 2002 U.S. National Institute of Environmental Health Sciences report as indicating that at a distance of one foot, for example, refrigerators, fluorescent lamps, electric tools, and many other appliances generate magnetic fields of 40 to 300 mG (Exh. EV-2, app. 5-7(Rev.) at 4).

the use of electricity in home and work environments produces power-frequency magnetic fields much higher than 1.0 mG in the near vicinity of operating electrical machinery (Exh. EV-2, app. 5-7(R), at 21). The Company argues that Channel Fish has provided no documentation that power-frequency magnetic fields from the Substation, or more generally power-frequency magnetic fields on the order of 2 mG – a level identified by Channel Fish – would or would be likely to cause interference problems with the specific equipment identified by Channel Fish (Company Brief at 119, n.66, citing Exh. NSTAR-PAV-2, at 2; Company Reply Brief at 43).[119]

Responding to Dr. Haes's assertion that magnetic fields from the Substation may exceed the Company's estimate, Eversource argues several points. First, the Company argues that its prediction of propagation of magnetic fields is accurate because its models are based on well-accepted laws of physics (e.g., Maxwell's equations) (Exh. EV-2, app. 5-7 (Rev.) at 6; Tr. 4, at 637-638; Eversource Reply Brief at 41, n.26). The Company argues that magnetic fields associated with future facility expansion are not relevant to Siting Board consideration of the Project because the Company is not seeking approval of such an expansion at this time (Exh. EFSB-G-19; Company Reply Brief at 47). The Company maintains that, in the power grid, harmonics of 60-Hz power are small in magnitude and so magnetic fields created by the harmonics would be minor (Exh. NSTAR-PAV-2, at 8; Company Reply Brief at 46). Finally, Eversource contends that Channel Fish's allegations and concerns regarding interference from power-frequency magnetic fields from the proposed Substation are hypothetical and baseless (Company Brief at 119, n.66, citing Exhs. CF-9; CF-10; NSTAR-PAV-2, at 2).

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[119] Channel Fish argues that an "experiment" undertaken by Dr. Haes, Dr. Peterson and Mr. Spako, which involved moving its magnetic anomaly detector to another location within its facility with higher magnetic field levels, demonstrated that the equipment was highly sensitive to magnetic fields (Channel Fish Brief at 52-53). Eversource argues that the experiment was devoid of any semblance of scientific method, noting issues such as an absence of written documentation, non-contemporary observations and measurements, and second-hand reporting by a third party (Company Reply Brief at 50-52, citing Tr. 5, at 786-788, 824-826). The Siting Board shares the Company's concerns with the methodological deficiencies in Channel Fish's experiment.

Considering the metal detector identified by Channel Fish as sensitive electronic equipment, i.e., susceptible to electromagnetic interference, Eversource witness Dr. Valberg indicated that the detector uses a 10,000 Hz to 1,000,000 Hz radio-frequency coil to induce an electric current in any ferrous or non-magnetic metals in the food materials processed by Channel Fish (Exh. NSTAR-PAV-2, at 4, 5). Dr. Valberg stated further that the operating manual for the metal detector refers to potential concerns with radio-frequency electromagnetic emitters, such as radio transmitters, inverters, and variable-speed drives (as well as walkie-talkie radios and fluorescent lights), which might create interference in the radio-frequency range used by the metal detector, far from the 60 Hz frequency of alternating fields associated with power transmission (id. at 5, 11; Exh. CF-2-9). Dr. Valberg indicated that the Substation switchgear and busbars would be gas-insulated, minimizing the potential for radio-frequency fields that can potentially emanate from corona discharges (Tr. 4, at 592-593, 597-598). Further, Dr. Valberg stated that he contacted a representative of the metal detector manufacturer, and was informed that the equipment would not experience interference from power-frequency magnetic fields up to at least 377 mG (Exhs. NSTAR-PAV-2, at 6; NSTAR-PAV-2(A)). Therefore, Eversource argues that there is no credible evidence that magnetic fields from the Substation would cause interference with what Channel Fish described as sensitive equipment within its facility (Company Reply Brief at 48).

Also, the Company argues that Channel Fish has not demonstrated that a Monte Carlo analysis of electromagnetic interference has ever been required in regulatory proceedings (Company Brief at 119, n.66; Company Reply Brief at 44).

Eversource argues that Channel Fish has not demonstrated that 115 kV substations generally have been identified as causing malfunction in the type of commercial electronic equipment Channel Fish has identified, nor has it identified any regulatory proceeding where the software used by the Company's EMF witness to project power-frequency magnetic fields has been judged to be deficient or incomplete (Company Brief at 119, n.66, citing Exh. NSTAR-PAV-2, at 2; Company Reply Brief at 43-44).

e. Analysis and Findings

A number of historical studies appear to show a statistical association between residential distances from transmission lines and human health effects. GSRP at 85. 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. In prior Siting Board decisions, the Board has recognized public concern about magnetic fields and has encouraged the use of practical and low-cost measures to minimize magnetic fields along transmission rights-of-way. Salem Cables at 88.

The record shows that magnetic field impacts for the Primary and Noticed Alternative Routes would be similar, although there are fewer residences along the Primary Route than the Noticed Alternative Route. Magnetic field levels along either route would be comparable to other underground transmission projects using the same technology that have been reviewed by the Siting Board. See Salem Cables at 85 to 87; New England Power Company d/b/a National Grid, EFSB 09-1/D.P.U. 09-52/09-53, 60 (2011) ("Worcester"). The Siting Board therefore finds that the Primary and the Noticed Alternative Routes are comparable with respect to magnetic field impacts.

The record shows that there are various theoretical ways to reduce magnetic fields from transmission lines, including changing the voltage or installing ferromagnetic shielding, but no low-cost means of reducing the magnetic fields applicable to the Project, beyond close positioning of the three phases, as proposed by the Company.

With respect to magnetic field impacts from the proposed Project on equipment at Channel Fish, the record shows that power-frequency alternating magnetic fields at 60 Hz would be the dominant influence, and that such Project impacts would be lower than typical magnetic fields in ordinary industrial environments. The record also shows that within the Channel Fish facility, power-frequency magnetic fields from the Project would be lower than typical existing fields created by existing equipment and wiring, as measured by consultants to Channel Fish.

The Siting Board accepts the standard modeling of magnetic fields used by the Company and the selection of conservative modeling assumptions to model upper-bound impacts. The modeling shows an induced magnetic field at the edge of the Channel Fish building of approximately 1 mG at peak load. The record shows that the Company's modeling used conservative assumptions for the critical variables including an assumption of peak power flow in the cables, and therefore a Monte Carlo analysis addressing likely coincident probabilities would be superfluous in this case. The occurrence frequency of various magnetic field levels lower than the predicted impacts is not needed for the Siting Board's evaluation. Considering the low level of modeled magnetic fields relative to the design specifications of the identified Channel Fish equipment, and considering frequency differences, an adverse effect of magnetic fields from the Project on Channel Fish's operations is unlikely.

The Siting Board finds that magnetic field impacts from construction and operation of the Project, using the Primary Route, would be minimized.

5. Wetlands and Waterways

a. Company Description

According to the Company, because the New Lines would be installed underground primarily within city streets and because the existing Chelsea Creek Crossing would be used to cross under the Chelsea Creek, no temporary or permanent impacts to wetlands or water bodies would result regardless of the route selected (Exhs. EV-2, at 5-145, 5-233; EFSB-W-1). Eversource stated that neither the Primary nor Noticed Alternative Route would located within wetland resource areas, but that both routes would be partially located within buffer zones to wetlands resource areas in the vicinity of the Chelsea Creek Crossing (Exh. EFSB-W-1; RR-CF-12(1)). The land on either side of the Chelsea Creek crossing is also subject to Chapter 91 jurisdiction; Eversource stated that it would apply to MassDEP for a minor modification to existing licenses for this portion of the route (Exhs. EV-2, at 5-145, 5-233, 5-256; EFSB-G-1; EFSB-W-4; Tr. 6, at 1078).

As described in Section V.C.1, above, the East Eagle Substation would be located south of the Chelsea Creek within the larger City Parcel (Exh. EV-2, at 5-245, fig. 5-9 sheet 1).

A portion of the Substation site would be located within the buffer zone to wetlands resources (Exh. EV-2, at 5-245 to 5-246; RR-CF-12(1)). Eversource indicated that there would be no impacts to wetland resource areas as a result of the Substation (Exh. EV-2, at 5-256). The Company would prepare a Stormwater Pollution Prevention Plan ("SWPPP") that outlines the control measures to be implemented during Project construction to prevent erosion and sedimentation from impacting adjacent waterways (Exh. CF-16; Company Reply Brief at 39). Construction of the Project would include the installation of stormwater management controls (e.g., an underground detention basin), improving groundwater recharge and control of sheet flow on a site that currently lacks any such controls (Tr. 6, at 1079-1082). Eversource stated that the use of clean construction techniques (i.e., not stockpiling any soil on site) would further minimize any water quality impacts to nearby waterways (Exh. EV-2, at 5-256). Eversource would file a Notice of Intent with the Boston Conservation Commission and would construct the Project in accordance with any conditions contained in the Conservation Commission's Order of Conditions (id.; Exhs. EFSB-G-1; EFSB-W-1; Company Brief at 70).

While no herbicides would be applied during Project construction, Eversource stated that following construction, growth of vegetation within the Substation would be prevented with bare-ground herbicide application (Exh. EFSB-LU-4). Eversource maintained that restricting herbicide use to within the Substation fenceline (where ground cover would consist of crushed stone) would limit the risk to nearby wetland resources (Exh. EFSB-LU-13). The Company further stated that all herbicides used at the Substation would be approved by the Massachusetts Department of Agricultural Resources for use in proximity to drinking water resources, which the Company believes would also ensure compatibility for use near wetland resources (id.).

The Company states that the East Eagle Substation would be located in filled tidelands and within the Chelsea Creek DPA. As such, the Substation requires a Chapter 91 License from the MassDEP (Exhs. EFSB-Z-10(1); EV-2, at 5-246; EFSB-W-4; RR-CF-12(1)).[120] The record shows that Eversource filed its Chapter 91 Application with MassDEP on November 19, 2014

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[120] Chapter 91 restricts the placement of non-water-dependent uses within tidelands. See G.L. c. 91, § 2; 980 CMR 9.32.

(Exh. EFSB-Z-10(1). On November 25, 2014, MassDEP issued a Determination that the Project is a Water-Dependent Use Project (Exh. EFSB-Z-10(2) at 1-8).[121] At the request of the Company, on January 9, 2015, the Chapter 91 application process for the Project was put on hold (Exh. EFSB-Z-10(3)).[122]

Finally, Eversource indicated that the Substation's design accounts for future sea level rise and severe storm impacts (Exh. EFSB-W-3). Eversource indicated that it had selected an elevation for the top of electrical equipment foundations that is higher than any anticipated flood levels (RR-CF-9(2) at 1-2). Specifically, the Company indicated that it calculated a design flood elevation for the Substation of 20.21 feet above MLLW by starting with the site's base flood elevation for a 500-year storm, 16.21 feet, sourced from a Federal Emergency Management Agency ("FEMA") Flood Insurance Study ("FIS"), and adding: (1) three feet of sea level rise over the 40-year design lifespan of the Project; and (2) an additional one foot cushion to raise equipment above flood elevations (Exh. EFSB-W-5; RR-CF-9(2) at 1-2). The Company then

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121 The Company asserts that the Project is a water-dependent use within the meaning of Chapter 91 on several grounds. The Company's central assertions are that the Project is an ancillary facility, and/or an accessory, to the Chelsea Creek Crossing, which is an existing MassDEP-approved water-dependent facility in the Chelsea Creek DPA (Exh. EFSB-Z-10(1) at 2, 6, 20-23). The Company also asserts that the Project "cannot reasonably be located further inshore" (id. at 2, 22). As discussed below, Channel Fish asserts that MassDEP erred in finding the Project to be a water-dependent use, and has filed comments objecting to the Determination in the MassDEP Chapter 91 proceeding (Exh. EFSB-Z-9(5)).

122 Eversource stated that because no state agency may issue a construction permit for any facility subject to G.L. c. 164 §69J until after the Siting Board has approved the petition to construct the facility, the Company would not normally begin the Chapter 91 licensing process until the Siting Board process was well under way (Tr. 8, at 1327-1329). In this case, however, the Company stated that it sought a determination on the water-dependency of the Project from MassDEP early in the process in order to determine whether the Project would be subject to Massachusetts Environmental Policy Act review ("MEPA") (id.).

selected a higher elevation, 22.00 feet above MLLW, for the elevation of the tops of electrical equipment foundations (Exh. EFSB-W-5; RR-CF-9(2) at 1-4).[123,124]

b. Positions of the Parties

As discussed previously, Channel Fish argues that the proposed Project is not a water-dependent use as defined under Chapter 91, notwithstanding MassDEP's November 25, 2014 Determination of water-dependency (CF Reply Brief at 14-16). Channel Fish asserts that the Substation's location within the Chelsea Creek DPA is contrary to the Commonwealth's desire to "preserve and protect the rights in tidelands of the inhabitants of the commonwealth by ensuring that the tidelands are utilized only for water-dependent uses or otherwise serve a proper public purpose" (CF Brief at 24, 44-45, citing G.L. c. 91 § 2). Channel Fish also argues that Eversource failed to consider whether construction of the Substation might exacerbate shoreline erosion along the Chelsea Creek, or adversely affect restored salt marsh habitat proposed by the Boston Redevelopment Authority ("BRA") in association with the USACE's Streambank Project (CF Brief at 43-44, citing Exh. CF-13 at 2; Tr. 7 at 1125-1126, 1165; Tr. 9 at 1520-1521, see Tr. 7, at 1122-1123).

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123 Eversource also provided information about the existing and proposed lowest elevation of the site, relative to the 500-year base flood level and historical data. According to the Company, the 500-year base flood elevation is, as noted, 16.21 feet; the highest water level at Boston Harbor recorded by the National Oceanic and Atmospheric Administration ("NOAA") was 15.10 feet; the lowest current elevation of the Substation site is 18.85 feet; and following construction, the lowest elevation of the Substation site would be 19.42 feet (all figures reported as relative to MLLW) (Exh. EFSB-W-5; RR-CF-9(2) at 1-3). The final site elevation would thus be 3.21 feet higher than the FEMA 500-year flood elevation (and 4.32 feet higher than NOAA records) (Exh. EFSB-W-5; RR-CF-9(2) at 1-3).

124 The Company used the term "design flood elevation" for both the calculated value of 20.21 feet above MLLW to avoid flood damage and the selected value of 22.00 feet above MLLW at which it intends to build the substation; also, the value of 22.00 feet above MLLW was described in the same document as an "overall site grade" and the level of the top of foundations for electrical equipment (RR-CF-9(2) at 1-4, 3-1, 3-2). In any case, the document indicates that the Company will place equipment higher than anticipated flood levels (id.).

In addition, Channel Fish asserts that given the Substation's proximity to the Chelsea Creek, there is a substantial likelihood that the Substation will be impacted by storm surges and rising sea levels (CF Brief at 26). Channel Fish argues that Eversource failed to fully account for the potential adverse effects of rising sea levels because the Company elected to base its design flood elevation on a three-foot sea level increase, rather than the upper bound of six feet included in the City of Boston's sea level rise estimate (CF Brief at 27, citing Exh. EFSB-W-5; Tr. 8, at 1382).

c. Company Response

Eversource asserts that the Project meets applicable Chapter 91 criteria defining water-dependent uses and, moreover, that MassDEP has already determined that the Project constitutes a water-dependent use under Chapter 91 (Exhs. EFSB-Z-10(1), at 23; EFSB-W-6; EFSB-Z-10(2); CF-EV-51(1). The Company notes that the validity of MassDEP's water-dependency Determination can be challenged only through the pending MassDEP Chapter 91 proceeding for the Project; it is not a matter that can be reviewed or altered by the Siting Board in this proceeding (Company Reply Brief at 35). Eversource states that the Substation would not exacerbate shoreline erosion near the Substation site (id. at 38-39). Eversource argues that the Substation site would be stabilized during and following Project construction, and that implementation of the Company's SWPPP would ensure that there are no effects to adjacent water bodies from erosion and sedimentation (id. at 39). Furthermore, Eversource argues that the Project will comply with Massachusetts Stormwater Standards, which would improve stormwater management on the site and, thus, improve erosion control (id. at 39-40). Eversource asserts that the proposed Substation would not interfere with any work proposed by the USACE, as the Project would be located internal to the City Parcel away from the shoreline (id. at 38). Finally, Eversource states that while the BRA had identified the area around the Substation site as a candidate for wetland restoration efforts, the scope of the BRA's plans has subsequently changed such that any restoration work in the vicinity of the Substation site has been eliminated (id. at 38-39).

d. Analysis and Findings

The record shows that both the Primary and Noticed Alternative Routes would be partially located within buffer zones to wetlands resource areas and lands subject to Chapter 91 jurisdiction. The Siting Board finds that the Primary Route is comparable to the Noticed Alternative Route with respect to wetland and waterway impacts.

The proposed East Eagle Substation, and other components of the Project, would be located on lands subject to Chapter 91 jurisdiction, including filled tidelands within the Chelsea Creek DPA. The record shows that Eversource has begun the process of seeking approval for the Project under Chapter 91, and that, as part of the pending MassDEP Chapter 91 proceeding for the Project, MassDEP has issued a Determination that the Project constitutes a Water-Dependent Use Project as defined under Chapter 91. We concur with the Company's observation that whether the Project constitutes a water-dependent use under Chapter 91 is not a matter within the permissible scope of this proceeding; it is a matter to be addressed through participation in the MassDEP Chapter 91 proceeding and any subsequent court proceedings.

The record also shows that a portion of the Substation site would be located within the buffer to wetlands resource areas. Eversource will file a Notice of Intent with the Boston Conservation Commission and construct the Project in accordance with any conditions contained in the resulting Order of Conditions. Eversource has committed to developing a SWPPP and implementing sedimentation and erosion control measures during Project construction and operation. Such measures will minimize potential impacts to adjacent water bodies and protect against shoreline erosion. Compliance with the Massachusetts Stormwater Standards would also result in an improvement to stormwater management at the Substation site. Thus, the record shows that the Substation is unlikely to exacerbate shoreline erosion on the City Parcel, or impede USACE shoreline stabilization efforts. Furthermore, while the scope of the BRA's plans no longer includes the construction of restored salt marsh habitat near the Substation site, based on the record in this proceeding the Siting Board concludes that the Project would be unlikely to negatively impact any restored salt marsh habitat should restoration efforts be undertaken in the future.

Finally, the Substation's location near Chelsea Creek requires consideration of the potential for adverse impacts from future sea level rise. Considering the severity of a 500-year storm, sea level rise projections for the design life of the Substation, and seeking at least a one-foot gap between floodwaters and electrical equipment, the Company calculated a design flood elevation for the Substation of 20.21 feet above MLLW. A combination of site grading and concrete equipment foundations reaching 22 feet relative to MLLW would raise electrical equipment at the Substation above the design flood elevation. The Siting Board acknowledges Channel Fish's concerns regarding the construction of electrical infrastructure in coastal areas that may be impacted by future sea level rise. However, it is the Siting Board's view that such risks can be minimized through careful substation design. In this case, the Siting Board concludes that the Company has appropriately addressed risks associated with sea level rise by positioning electrical equipment above any anticipated flood level.

Assuming the issuance by MassDEP of the various Chapter 91 approvals required for the Project, including the issuance of a Chapter 91 License for those portions of the Project that would be located within the Chelsea Creek DPA, and implementation of the Company's proposed mitigation measures, the Siting Board finds that impacts to wetlands and waterways along the Primary Route would be minimized.

6. Noise

a. Company Description

Eversource stated that construction of the New Lines has the potential for noise impacts to adjacent residences, businesses, and other sensitive receptors (Exh. EV-2, at 5-140). According to the Company, these impacts would be limited to the construction period, and are dependent on the type of construction equipment used during each phase of construction, as well as the hours during which construction activities are performed (id.). Eversource stated that because construction of the New Lines would follow the same basic approach regardless of the route selected, the types and duration of construction-related noise would be similar for both the Primary and Noticed Alternative Routes (id. at 5-141).

As previously described, Eversource stated that the Noticed Alternative Route is approximately 1.1 miles longer than the Primary Route, has a greater number of adjacent residences, commercial/industrial buildings, and sensitive receptors (id. at 5-141 to 5-142, 5-230). Additionally, Eversource stated that the Primary Route would take advantage of the existing Eastern Avenue Duct Bank where, for approximately one mile, only cable pulling, splicing, and testing would be required (id. at 5-1 to 5-2; RR-EFSB-40). As such, Eversource submits that the Primary Route is preferable to the Noticed Alternative Route with respect to noise impacts (Exh. EV-2, at 5-142, 5-230; RR-EFSB-40).

The Company's proposed typical construction hours are Monday through Saturday, 7:00 a.m. to 6:00 p.m., or later when daylight permits (Exhs. EV-2, app. 5-3 at 6-1; EFSB-NO-14). The Company proposes to work beyond these normal construction hours for continuous operations such as filling of transformers, following weather events or other schedule exigencies, or for other unforeseen circumstances (Exhs. EV-2, at 5-9; EFSB-NO-1). Furthermore, the Company acknowledged that it may be necessary to modify these hours by limiting construction to off-peak traffic hours (daytime or nighttime) along some segments of the Project route (Tr. 10, at 1698-1700, 1725). According to the Company, construction work hours are largely determined by municipalities as part of the issuance of road opening permits (Tr. 9, at 1460-1462). Specific scheduling recommendations the Company has received from the impacted municipalities and associated Siting Board conditions are discussed in Section V.C.2 above. Typical construction hours permitted by the cities of Boston, Chelsea and Everett are outlined in each municipality's noise ordinance (Exh. EFSB-NO-2). Reporting on the requirements of these ordinances, Eversource stated that construction is permitted in the City of Boston weekdays from 7:00 a.m. to 6:00 p.m., with work outside of these hours allowed only with a permit from the Commissioner of Inspectional Services Department (Exh. EFSB-NO-2(1) at 2; Tr. 6 at 1044). Construction in the City of Chelsea is permitted from 7:00 a.m. to 6:00 p.m. Monday through Friday, and from 8:00 a.m. to 4:00 p.m. on Saturdays, with a similar waiver process available for construction outside of these hours (Exh. EFSB-NO-2(2) at 2; Tr. 6, at 1050-1051). In the City of Everett, construction is permitted from 7:00 a.m. to 9:00 p.m., and, while not formally described in the ordinance, Eversource asserts that permission to construct

outside of these hours can be sought through discussions with the appropriate compliance officer (Exh. EFSB-NO-2(3) at 2; Tr. 6, at 1046-1047).

The Company stated that it would implement the following construction noise mitigation measures: (1) contractors would use well-maintained equipment with functioning mufflers; (2) contractors would be required to comply strictly with Massachusetts anti-idling laws and regulations to prevent equipment from producing unnecessary noise;[125] (3) operating stationary noise generating equipment, such as whole tree chippers or compressors, away from nearby residences, where flexibility to do so exists; and (4) contractors would receive training that highlights the Company's requirements with respect to well-maintained equipment, anti-idling and other relevant policies (Exh. EV-2, at 5-241, 5-253). 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 to them for use at cable splicing locations (Exh. EFSB-NO-16).[126] Eversource stated that construction activities would comply with applicable municipal noise ordinances and bylaws (Exhs. EV-2, at 5-9; EFSB-NO-2; EFSB-NO-12).

Eversource also assessed the potential for ongoing operational noise impacts from the proposed East Eagle Substation (Exh. EV-2, at 5-245). The Company's assessment included an ambient noise survey to quantify the existing acoustical environment, noise modeling to predict sound levels from operation of the Substation's transformers, and a comparison of pre- and post-Project noise levels (id.). According to the Company, existing ambient noise levels at the Substation site are consistent with those common to industrial areas, and operation of the Substation would result in a minimal increase in noise (id. at 5-245, app. 5-3, at 7-1). Eversource

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125 See Section V.C.8, for further discussion of the Massachusetts anti-idling law and regulations.

126 As a matter of Company policy, Eversource stated that typically it does not consider placing temporary noise barriers around the work zone unless a complaint is received that cannot be resolved through other measures, such as using quieter equipment (Exh. EFSB-NO-7). Eversource asserted that the use of temporary noise barriers could pose hazards to workers and the general public, due in part to the difficulty in anchoring these types of systems (id.).

stated that the operation of three transformers at the Substation, each surrounded, as proposed, by a three-sided concrete wall, would result in an increase in total noise of less than three dBA at the Substation property lines compared to existing measured ambient noise levels (id. at 5-245, app. 5-3, at 5-3).[127] Eversource's assessment showed no "pure tone" conditions, as defined by MassDEP (id., app. 5-3, at 5-3).[128] Additionally, Eversource stated that noise impacts from operation of the Substation to industrial or residential areas are not expected to exceed the appropriate Boston Air Pollution Control Commission overall sound level limits (id., app. 5-3, at 5-3 to 5-4). Accordingly, Eversource stated that the Project would be in compliance with all applicable noise regulations (id. at 7-1).

b. Positions of the Parties

Jacobs submits that in the event that the Project is approved along the Primary Route, the Company should be required to: (1) take appropriate steps to prevent noise from impacting abutting properties and businesses; and (2) specify, in advance and in writing, what those procedures would be (Jacobs Brief at 9).

c. Analysis and Findings

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 sensitive receptors along each route. The record shows that the Primary Route is approximately 1.1 miles shorter than the Noticed Alternative Route, would pass fewer residences, commercial/industrial buildings, and sensitive receptors, and would allow the Company to take advantage of the previously constructed Eastern Avenue Duct Bank

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127 While the proposed Project includes the installation of two transformers at the East Eagle Substation, the Substation is being constructed to accommodate a future third transformer (Exh. EFSB-NO-9). With two transformers, the noise increase from operation of the Substation would be less than modeled by the Company (id.).

128 The MassDEP defines a pure tone condition where any one octave band sound pressure level exceeds the two adjacent frequency bands by three decibels or more.

(i.e., for approximately one mile of the Primary Route, only cable pulling, splicing, and testing activities would be required). Therefore, the Siting Board finds the Primary Route to be preferable to the Noticed Alternative Route with respect to noise.

The Company proposes a six day-per-week construction schedule from 7:00 a.m. to 6:00 p.m., Monday through Saturday. While this schedule would be consistent with the construction hours permitted by the City of Everett, municipal authorization would be required in Boston and in Chelsea. As described in Sections V.C.1 and V.C.2, above, much of the Primary Route is industrial in nature and subject to high traffic volumes. In order to minimize traffic impacts from Project construction, the Siting Board has prescribed specific construction hours for portions of the Primary Route (see Section V.C.2). Further conditions are necessary to minimize noise impacts from the Project.

The Company has identified one residence (near the corner of Robin and Lynde Streets in Everett) that would be within 50 feet of a proposed manhole location. The City of Everett has requested that construction of this manhole take place from 6:00 p.m. to 3:00 a.m., with work continuing to 3:00 p.m. to complete installation. To minimize nighttime noise impacts on the nearby residence from manhole construction, and cable pulling and splicing activities, the Siting Board directs the Company to use portable noise barriers for work at this manhole location. Furthermore, the Siting Board directs the Company to limit Saturday construction to 9:00 a.m. to 5:00 p.m. for Williams Street and Marginal Street between Spruce Street and Shawmut Street in Chelsea; and at the East Eagle Substation site in East Boston, if Saturday construction is approved by the City of Boston. These restrictions to the Company's proposed construction hours are appropriate given the residential nature of these areas, and the stated preferences of impacted municipalities (see Section V.C.2).[129]

The Company described a number of noise mitigation measures to be implemented during Project construction, including the use of well-maintained construction equipment with

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[129] The Siting Board notes that further restrictions on the Company's construction hours may be imposed by local municipal authority as part of the local street-opening permit process applicable to the Company.

functioning mufflers, strict compliance with Massachusetts anti-idling laws and regulations, and the use of the quietest generators and portable HVAC units reasonably available. The Company is obligated to abide by these commitments during Project construction, and there is nothing in the record to indicate that additional written documentation, as requested by Jacobs, is warranted in this instance.

Regarding potential noise impacts from the ongoing operation of the East Eagle Substation, the record shows that operation of up to three transformers at the Substation would increase noise levels at the Substation property line by less than three dBA, compared to existing conditions, and would not result in the presence of any pure tone conditions as defined by MassDEP. The modeled noise increase is minimal, and is consistent with applicable noise criteria and past Siting Board precedent.

With the implementation of the above noise conditions, the Siting Board finds that noise impacts from construction and operation of the Project along the Primary Route would be minimized.

7. Visual

a. Company Description

Construction of the New Lines underground along either the Primary or Noticed Alternative Routes would not have any permanent visual impacts (Exh. EV-2, at 5-1, 5-5). In contrast, the proposed East Eagle Substation would have a long-term visual impact. As described in Section V.C.1, above, the Substation would be located within a currently vacant, previously disturbed, parcel of land on East Eagle Street in East Boston; an area that the Company has characterized as industrial in nature (id. at 5-237 to 5-238, 5-242, fig. 5-7, sheet 1). According to the Company, the Substation site currently has visible stockpiles of dirt and gravel, overgrown areas, and broken pavement (id. at 5-242; Tr. 6, at 1080). There are some trees located along the eastern edge of the property (Exh. EFSB-V-2). As part of the Project, Eversource would remove 35 trees to accommodate Substation equipment (Exhs. EFSB-V-2; EFSB-V-10; Tr. 6, at 954-955). Eversource stated that this tree clearing would have limited to no impact on the visibility of the Substation (Exh. EFSB-V-2).

Eversource stated that equipment to be installed at the Substation would include transformers and adjacent sound walls (all approximately 25 feet tall); a control building (approximately 30 feet tall); GIS facilities (approximately 20 feet tall); and capacitor banks (approximately 10 feet tall) (Exh. EFSB-V-6; RR-EFSB-79(1)). The Substation also includes walls up to 32 feet tall, as described below (RR-EFSB-79(1) at 5-6). The Company stated that lighting within the Substation would be task oriented (as distinguished from area-oriented lighting) (Exh. EFSB-V-7). Upward-facing lighting would be required to illuminate the transformer area only, and this lighting would be switched separately from the downward-facing lighting installed elsewhere in the Substation (id.).

Eversource stated that the Substation would not have direct street frontage, and would be mostly obscured from East Eagle Street by anticipated future development elsewhere on the City Parcel (RR-EFSB-79). Accordingly, the Company focused on Project impacts on views from public use areas to the south, north, and west, including the American Legion playground, the Condor Street Urban Wild, and the proposed soccer field (id.). Eversource stated that the Project would include screening walls constructed from concrete and multi-layer fiberglass components between the Substation and each of these public use areas (RR-EFSB-77). Eversource stated that it was working with the BRA and the City of Boston on the architectural treatment, design, and material of the proposed screening wall, so that the visual aesthetic of the site would blend in with existing and proposed surrounding uses (Exh. EFSB-4, at 3; RR-EFSB-37).

Specifically, for the portion of the west and south sides of the Substation site where the transformer bays would be located, the Company proposes to install an approximately 25-foot-tall screening wall made of precast concrete panels with a textured architectural finish (RR-EFSB-79).[130] For the remaining portion of the west side of the Substation, as well as the majority of the north side of the Substation, the Company proposes to install an approximately 32-foot-tall screening wall consisting of an approximately 8-foot-tall row of precast concrete

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130 Eversource stated that this screening wall would act as a firewall in addition to providing visual and noise mitigation (Tr. 9, at 1518; RR-EFSB-79). See Section V.C.6, above for further discussion of the Company's proposed noise mitigation measures.

panels topped by an approximately 24-foot-tall non-conductive fiberglass panel system (id.). Eversource stated that the multiple layers and colors of the fiberglass screening would create visual interest, while imparting a level of transparency and lightness to the wall (id.). To enclose the remainder of the Substation (located to the east and south), Eversource proposes an approximately 12-foot-tall neutral-colored fiberglass fencing system (id.).[131] According to the Company, this fence would have a pattern of small openings, giving it a degree of transparency (id.). Eversource stated that the final patterning and color of the precast concrete panels and the fiberglass panel system would be reviewed with the Boston Property and Construction Management Department and the BRA (id.).

According to the Company, foot and car traffic along East Eagle and Shelby Streets, as well as the first story of adjacent residences along these streets, would have views of the wall surrounding the Substation (Exh. EFSB-V-4). The second floor of some of the neighboring residences would have partial, obscured views of Substation equipment (id.). Third floor residences with clear sight lines to the Substation would have generally unobstructed views of Substation equipment (id.). Overall, Eversource stated that while the East Eagle Substation would be a new visual element on the City Parcel, it would not be inconsistent with the existing industrial nature of the location (Exh. EV-2, at 5-242). Additionally, Eversource stated that while the City of Boston's plans for developing the remainder of the parcel are uncertain, if constructed, the new buildings proposed by the City would block views of the Substation from many of the nearby residences (id.; RR-EFSB-24(1); Company Brief at 110).

Eversource stated that no landscaping is proposed as part of the Project for two reasons: (1) equipment would fully occupy the Substation property; and (2) the architectural screening wall and fence described above are intended to provide appropriate visual mitigation (Exh. EFSB-V-5; RR-EFSB-37). Nonetheless, in response to a request from the Boston Harbor

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131 Eversource stated that it would cost close to an additional $800,000 to extend the proposed taller concrete and fiberglass screening wall around all sides of the proposed East Eagle Substation (Exhs. CF-EV-50; EFSB-V-3(S1)(1); RR-EFSB-38).

Association d/b/a Boston Harbor Now, the Company committed to plant five to ten trees in East Boston as part of the Project (RR-EFSB-37).[132]

b. Analysis and Findings

For both the Primary and Noticed Alternative Routes, the Company proposes underground construction, which would have no associated permanent visual impact. Therefore, the Siting Board finds that the Primary Route and the Noticed Alternative Route would be comparable with respect to visual impacts.

The record shows that the Substation would be a new visual element on the already disturbed City Parcel, within a broader area that includes industrial visual elements. The Company has committed to developing, in association with the BRA and the City of Boston, an architectural screening wall for the north, southwest, and west sides of the Substation site, and to install a fiberglass fence along the remaining perimeter of the property. Eversource is not proposing any vegetative landscaping either on the Substation site itself, or directly outside of the Substation fenceline. Given the small size of the Substation site, the placement of the equipment precludes on-site landscaping. As discussed, the Substation site is currently surrounded by vacant land owned by the City of Boston, with potential development proposed on the City Parcel. Any landscaping outside of the Substation must therefore be approved by the City of Boston, and would likely be contingent on the final configuration of the development project.

The Company has stated that construction of the East Eagle Substation would require removal of approximately 35 trees from the Substation site. Eversource has committed to planting five to ten trees in East Boston based on a request by Boston Harbor Now. The planting of these trees should be part of an integrated landscaping plan with the City of Boston to mitigate potential visual impacts relating to the placement of the Substation on the City Parcel. Given

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[132] According to the Company, Boston Harbor Now's request for a donation of five to ten trees was made with the intent of furthering the goals of Boston's Climate Action Plan (which encouraged the planting of trees in Boston), rather than for the purposes of visual mitigation (RR-EFSB-37).

that any landscaping would occur on the City of Boston property and that redevelopment would shape such landscaping plans, the Siting Board directs Eversource to enter into discussions with the City of Boston regarding the potential for the Company to develop a landscaping plan including the planting of the ten trees on the City Parcel. Should the City of Boston indicate its support for such plantings, the Company is directed to file with the Siting Board a mutually agreed upon landscaping plan within one year of the issuance of this Decision, laying out at a minimum the type, location, and timing of the proposed plantings. Should the City of Boston support Company-funded landscaping on the City Parcel, but prefer not to commit to any specific actions prior to the finalization of its redevelopment plans for the parcel, the Company, in consultation with the City of Boston, is directed to file with the Siting Board: (1) plans for planting ten trees elsewhere in East Boston within one year of the issuance of this Decision; and (2) an annual progress report on the development of its landscaping plan. Any annual progress reports are to be filed with the Board until a final landscaping plan is prepared, or for a five-year period following completion and initial operation of the Project, whichever is sooner. If five years after Project completion a final landscaping plan has not yet been prepared, the Company is to consult with the Siting Board to determine whether the Board will require continued reporting or other actions, as it deems appropriate. Finally, if the City of Boston does not support Company-funded landscaping on the City Parcel, the Company is directed to file with the Siting Board plans for tree planting elsewhere in East Boston, consistent with its commitments to Boston Harbor Now, within six months of the issuance of this Decision.

The Siting Board finds that with the implementation of the Company's proposed architectural screening, and the above condition regarding landscaping, the visual impacts from construction of the Project along the Primary Route would be minimized.

8. Air

a. Company Description

Eversource provided information on air impacts from construction of the Project, and ongoing operation of the Substation. To mitigate air emissions from construction equipment, Eversource stated that any diesel-powered, non-road construction equipment rated

50 horsepower or above, whose engine is not certified to USEPA Tier 4 standards, and that would be used for 30 days or more over the course of the Project would be retrofitted with USEPA-verified (or equivalent) emission control devices (e.g., oxidation catalysts or other comparable technologies) (Exh. EV-2, at 5-254). The Company also stated that it would exclusively use ultra-low-sulfur diesel fuel for all construction equipment it uses for the Project, and that it would comply with state law and MassDEP regulations that limit vehicle idling to no more than five minutes except in certain circumstances (such as when vehicles need to run their engines to operate accessories) (id.; Exh. EFSB-A-2). To minimize the potential for airborne dust from construction activities, Eversource stated that it would require its contractors to place water trucks with misters in or near work areas (Exh. EV-2, at 5-253). Additionally, excavated soils would be transferred directly from the trench to a covered truck to minimize the potential for the release of dust and for soil migration from the work area (id.).

Eversource identified potential air impacts from electrical equipment proposed at the East Eagle and Mystic Substations. Eversource proposes to use sulfur hexafluoride ("SF_6"), a gas identified as a non-toxic but highly potent greenhouse gas ("GHG"), at these substations (Exh. EFSB-A-1).[133] According to the Company, new equipment that would contain SF_6 would include the 115 kV GIS facilities at the East Eagle Substation (approximately 3,500 pounds of SF_6), and the proposed circuit breaker at the Mystic Substation (approximately 500 pounds of SF_6) (id.; Tr. 6, at 1088).[134] This new equipment would be designed by manufacturers for an annual emission rate of 0.1 percent, which the Company stated was in compliance with the MassDEP standard (310 CMR 7.72) of not more than one percent per year (Exh. EFSB-A-1).

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133 On August 11, 2017, MassDEP issued final regulations in accordance with the Global Warming Solutions Act ("GWSA") that updated regulations under 310 CMR 7.72 to include declining annual aggregate emission limits for SF_6 and other measures on gas insulated switchgear. Companies and municipalities that own, lease, operate or control GIS purchased after June 1, 2015 that contains SF_6 and is located in Massachusetts must comply with 310 CMR 7.72.

134 Eversource currently uses SF_6 at the Mystic Substation for circuit breakers, circuit switches, and gas insulted duct, which have a combined nameplate capacity of 9,767 pounds (Exh. EFSB-A-1).

Eversource reported that filling new equipment with SF_6 would take place at installation, and that no SF_6 would be stored on site once the Project was complete (id.). Eversource employees who handle or supervise handling of SF_6 receive training from the equipment manufacturer (id.). A specialty gas vendor recovers and reclaims SF_6 gas at equipment retirement (id.).

b. Positions of the Parties

Jacobs submits that in the event that the Project is approved along the Primary Route, the Company should be required to take appropriate steps to prevent dust and air pollution from impacting abutting properties and businesses, and that the Company should be required to specify, in advance, in writing, what those procedures would be (Jacobs Brief at 9).

c. Analysis and Findings

The record shows that air impacts along the Primary Route and the Noticed Alternative Route would be comparable in nature, but that the greater length of the Noticed Alternative Route combined with the need for new conduit between the Chelsea Creek Crossing and the Chelsea Substation, and the resulting longer duration of construction, would produce greater construction-related air impacts. Accordingly, the Siting Board finds that construction along the Primary Route is preferable to the Noticed Alternative Route with respect to air impacts.

The Company has specified mitigation for construction equipment air emissions including retrofitting all non-Tier 4 diesel-powered non-road construction equipment prior to construction, and limiting vehicle idling to five minutes except under certain circumstances. Water misters and direct transfer of excavated soils to covered trucks would minimize the potential for airborne dust and for soil migration out of the work area. Additionally, the Company committed to installing SF_6 containing equipment with an annual emission rate of 0.1 percent, lower than the MassDEP standard of not more than one percent per year. The Company is obligated to abide by these commitments during Project construction, and there is nothing in the record to indicate that additional written documentation, as requested by Jacobs, is warranted in this instance.

The Siting Board directs Eversource to inform the Board if it adds additional SF_6 to the equipment proposed in association with the Project, or replaces any of said equipment due to SF_6 loss, 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 Board will require continued reporting, as it deems appropriate.

The Siting Board finds that, with the implementation of the Company's proposed mitigation measures and the conditions outlined above, potential air impacts from construction and operation of the Project along the Primary Route would be minimized.

9. 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 would have lower land use, hazardous waste, noise, and air impacts than the Noticed Alternative Route, largely related to its shorter length than the Noticed Alternative Route and to the presence and proposed use of the existing Eastern Avenue Duct Bank. The two routes are comparable with respect to traffic, safety, magnetic field, water, and visual impacts. On balance, the Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to environmental impacts.

D. Cost

Eversource stated that, compared to the Primary Route, the increased length of the Noticed Alternative Route would result in additional expenditure (Exh. EV-2, at 5-148, 5-236). Using a generic $10 million cost-per-mile assumption, the Company estimated the transmission line portion of the Project cost would be $47.4 million for the Primary Route and $58.7 million for the Noticed Alternative Route (id.).[135,136] The Company identified no differences for the cost

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135 The Siting Board notes that the East Eagle-Chelsea Line along Primary Route would use existing conduit for the majority of the route, whereas the Noticed Alternative Route

or scope of work for the East Eagle Substation, or the associated distribution feeder expansion between the two routes. The Company argued that because the cost differential between the two routing options is driven by the greater length of the Noticed Alternative Route, the difference in cost is expected to persist as the Project moves through more detailed engineering (id.). For these reasons, the Siting Board finds the Primary Route is preferable to the Noticed Alternative Route with respect to cost.

E. Reliability

Eversource stated that many considerations go into determining the reliability of an electric transmission project, including the total exposure (length) of the transmission line, the location of the facilities, and the types of construction methods required (Exh. EV-2, at 5-148, 5-236). Both the Primary and Noticed Alternative Routes would use 115 kV underground transmission lines, and the Company maintains that there are no differences between the physical environment and the construction methodologies proposed for the Primary and Noticed Alternative Routes (id.). Eversource does not consider the shorter length of the Primary Route to provide a material advantage in reliability over the Noticed Alternative Route (id.). Accordingly, the Siting Board finds the Primary Route and Noticed Alternative Route are comparable with respect to reliability.

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

The Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to environmental impacts and cost, and that the two routes are comparable

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would not. Cost savings associated with the use of the existing conduit are not reflected in the Company's comparison because the Company pro-rated costs on length alone.

136 The Siting Board notes that a more specific Project cost estimate of $13 million per cable mile was provided by the Company over the course of the proceeding (RR-EFSB-54(S-1)(R-1)). Eversource indicated that this updated estimate would not impact the Company's comparison of the Primary and Noticed Alternative Routes since the Company believed the cost of both routes would rise equally, and the relative cost differential would remain unchanged (id.).

with respect to reliability. The Siting Board therefore finds 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.

Based on review of the record, the Siting Board finds that the Company provided sufficient information to allow the 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 would be minimized. The Siting Board finds that the Project along the Primary Route would achieve an appropriate balance among conflicting environmental concerns as well as among environmental impacts, reliability, and cost.

VI. 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 and Safety 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 II above, the Siting Board found that the Project would improve the reliability of electric service in Massachusetts.

In Section V.C.8, the Company committed to use only retrofitted non-Tier 4 off-road construction equipment to limit emissions of particulate matter during Project construction. This is consistent with MassDEP's Diesel Retrofit Program, which is designed to address health

concerns related to diesel emissions. In Section V.C, the Siting Board finds that the Project's traffic, hazardous materials and safety, magnetic field, and air impacts have been minimized.[137] Accordingly, subject to the Company's specified mitigation and the Board's conditions set forth in Section X, below, the Siting Board finds that the Company's plans for construction of the Project are consistent with current health and safety policies of the Commonwealth.

2. Environmental Protection Policies

The 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 and MassDEP as the entities primarily responsible for implementing the GWSA. G.L. c. 21N, §§ 2-5.

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"). In a determination accompanying the 2020 CECP, the Secretary set the 2020 state-wide GHG emissions limit at 25 percent below 1990 levels. 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 included the directive that MassDEP issue regulations pursuant to Section 3(d), setting declining annual aggregate GHG emissions limits for sources or categories of sources that emit GHGs, in order to achieve the 2020 limit. See Executive Order 569, at 3; see also G.L. c. 21N, § 3(d). On August 11, 2017, MassDEP issued final regulations in accordance with the GWSA.

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137 Channel Fish argues that the Project is inconsistent with Massachusetts' policies regarding health, environmental protection and resource use (including policies concerning the preservation of Designated Port Areas, climate change resiliency, and public safety); these arguments by Channel Fish are addressed in Sections III.C and V.C, above.

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 Chelsea/East Boston/Lynn Load Area 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 6-3). In addition, the Siting Board has found in Section V.C.8, above that, as specified by the Company, and with additional conditions imposed in this Decision, SF_6 emissions would be minimized.

In Section V.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, and visual impacts; and (2) concluded that, subject to the specified mitigation and conditions set forth below, the Project's environmental impacts have been minimized.

The Siting Board's review of the Project is not subject to, but is consistent with the Commonwealth's EJ Policy.[138] The EJ Policy has both an enhanced public participation provision and an enhanced analysis provision. Because the Project does not exceed any MEPA environmental notification form review thresholds that trigger the enhanced public participation or enhanced review provisions, the Board's review of the Project in this proceeding is not subject to the EJ Policy. Based on a linguistic analysis of the populations in the Project area communities, however, the Presiding Officer directed Eversource to implement a number of public outreach measures consistent with the enhanced public participation component of the EJ Policy, including publication of the Notice of Public Hearing in Spanish and Portuguese as well as English; publication of the Notice in English-language, Spanish-language and Portuguese-language newspapers; and the provision of a Spanish and Portuguese-speaking translator at the public hearing.

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[138] The Commonwealth first issued its EJ Policy on October 9, 2002. On January 31, 2017, EEA issued an updated version of the EJ Policy. The Siting Board's review of the Project was not subject to either version of the EJ Policy.

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.

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 IV, the Siting Board reviewed the process by which the Company selected the route for the Project and the location of the East Eagle Substation. The Project has been designed and conditioned to avoid or minimize impacts to natural and cultural resources by being placed underground in city streets and within existing underground duct banks. No previously undisturbed property will be affected by the siting, construction, or installation of the Project. Additionally, the Company has appropriately addressed risks from sea level rise associated with the Substation's proximity to the Chelsea Creek by proposing to place equipment 22 feet above MLLW.

The Commonwealth seeks to preserve and protect the rights of the public, and to guarantee that private uses of tidelands and waterways serve a proper public purpose, through the Massachusetts Public Waterfront Act (Chapter 91). The Commonwealth has also established Designated Port Areas (including the Chelsea Creek Designated Port Area), to promote and protect water-dependent industrial uses. As discussed in Section V.C.5, above, MassDEP has determined the Substation and New Lines is a Water-Dependent Use Project and therefore is consistent with this policy.

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.

VII. ANALYSIS UNDER SECTION 6 OF CHAPTER 665 OF THE ACTS OF 1956

Pursuant to the provisions of Section 6 of Chapter 665 of the Acts of 1956, Eversource seeks specific individual and comprehensive exemptions from the Boston Zoning Code to allow construction of the Substation.

A. Individual Zoning Exemptions

1. Standard of Review

The Siting Board most commonly reviews requests for exemptions from local zoning ordinances pursuant to the Department's authority to grant such exemptions under G.L. c. 40A, §3. The provisions of G.L. c. 40A, however, do not apply to the City of Boston. Emerson College v. City of Boston, 393 Mass. 303 (1984). However, the Department has the authority to grant exemptions from the Boston Zoning Code by Special Act of the Legislature. Specifically, Section 6 of Chapter 665 of the Acts of 1956 provides that:

> A building, structure, or land used or to be used by a public service corporation may be exempted from the operation of a zoning regulation or amendment if, upon petition of the corporation, the state department of public utilities shall, after public notice and hearing, decide that the present or proposed situation of the building, structure, or land in question is reasonably necessary for the convenience or welfare of the public.

In evaluating a petition for zoning relief pursuant to Section 6 of Chapter 665 of the Acts of 1956, the Department relies on the standard of review established for G.L. c. 40A, § 3 petitions. NSTAR Seafood Way at 7.; NSTAR Electric Company, D.P.U. 13-126/127, at 5 (2014) ("NSTAR Electric Avenue"); Boston Edison Company, EFSB 14-1/D.T.E. 04-5, at 392, n.5 (2005). Thus, a petitioner seeking exemption from a provision of the Boston Zoning Code under Chapter 665 of the Acts of 1956 must meet three criteria. First, the petitioner must qualify as a public service corporation. Save the Bay, Inc. v. Department of Public Utilities, 366 Mass. 667 (1975) ("Save the Bay"); NSTAR Seafood Way at 75. Second, the petitioner must demonstrate that the proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public. NSTAR Seafood Way at 7; Massachusetts Electric Company, D.T.E. 01-77, at 4 (2002). Third, the petitioner must establish that it requires

exemption from the zoning ordinance or bylaw. NSTAR Seafood Way at 7-8; Boston Gas Company, D.T.E. 00-24, at 3 (2001).

2. 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, NSTAR Seafood Way at 8; Berkshire Power Development, Inc., D.P.U. 96-104, at 26-36 (1997) ("Berkshire Power").[139]

b. Analysis and Findings

The Company is an electric company as defined by G.L. c. 164, § 1 and, as such, qualifies as a public service corporation. See also Exh. EV-4, at 7. Accordingly, the Siting

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139 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). 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 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.

Board finds that the Company is a public service corporation for the purposes of G.L. c. 40A, § 3 and, therefore, for the purposes of Section 6 of Chapter 665 of the Acts of 1956 as well.

3. 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; NSTAR Seafood Way at 9. 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; NSTAR Seafood Way at 9.

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;[140] 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

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[140] 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.

of the land or structures is reasonably necessary for the convenience or welfare of the public. NSTAR Seafood Way at 10; Boston Gas Company, D.T.E. 00-24, at 2-6 (2001); Tennessee Gas Company, D.T.E. 98-33, at 4-5 (1998).

b. Analysis and Findings

With respect to the need for, or public benefits of the Project, the Siting Board found in Section II, above, that additional electric resources are needed to maintain a reliable supply of electricity in the Chelsea/East Boston/Lynn Load Area.

In Section III, the Siting Board analyzed a number of different project approaches, in addition to the Company's proposed Project, that might be used to meet the reliability need identified in Section II. The alternative approaches considered included transmission alternatives as well as non-transmission alternatives such as generation, energy efficiency, demand response, and energy storage. The Siting Board concluded that the Company's proposed Project is preferable to other project approaches.

In Section IV, the Siting Board reviewed the Company's route selection process, and determined that the Company applied a reasonable set of criteria for identifying and evaluating routes to ensure that the Company did not overlook a clearly superior route. In Section V, the Siting Board also compared the benefits of the Primary and Noticed Alternative Routes, and concluded that the Primary Route 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 the Siting Board reviewed the potential environmental impacts of the Project and found that, while the Project would result in some local adverse impacts, the impacts of the Project would be minimized with the implementation of certain mitigation measures 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 Project is reasonably necessary for the convenience or welfare of the public

for the purposes of G.L. c. 40A, § 3 and, therefore, for the purposes of Section 6 of Chapter 665 of the Acts of 1956.[141]

4. Individual Exemptions Required

a. Standard of Review

In determining whether exemption from a particular provision of a zoning code is "required" within the meaning of G.L. c. 40A, § 3, the Siting Board looks to whether the exemption is necessary to allow construction or operation of a proposed project. NSTAR Seafood Way at 10; New England Power Company d/b/a National Grid, D.P.U. 12-02, at 6-7 (2012); Tennessee Gas Company, D.P.U. 92-261, at 20-21 (1993).[142]

b. List of Exemptions Sought

Eversource seeks exemption from five individual provisions of the Boston Zoning Code. For four of the five exemptions requested, the Company asserts (1) that the Project physically cannot, or may not, meet the substantive requirements of the zoning provision from which

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141 Channel Fish asserts that the Project is not reasonably necessary for the convenience or welfare of the public, because Solution 4 and Solution 5 would also meet the identified needs with minimum impacts, and would not require any of the zoning relief requested by Eversource (CF Brief at 62). The analysis of public convenience and welfare does not require a comparison of the proposed use with other possible uses. It requires a finding that the proposed use will serve the public convenience or welfare. The Siting Board finds that the proposed Project meets this standard.

142 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).

exemption is requested, and (2) that, without such an exemption, the Company would need to seek a variance from the City of Boston Zoning Board of Appeal. The fifth exemption requested by the Company pertains to a Boston Zoning Code provision (Section 53-13) which sets forth qualitative standards to be used by the BRA in providing a recommendation to MassDEP regarding the Project, as part of the Chapter 91 licensing process. The Company seeks an exemption from this provision of the Boston Zoning Code solely to preclude an appeal of the BRA Recommendation under the Zoning Code, instead of, or in addition to, an appeal of the Recommendation under Chapter 91.[143] The City of Boston has indicated its support for the granting of the Company's zoning exemption requests (Exh. EFSB-Z-7(S-1)(1)).

i. Section 53-15 and Use Table C

The proposed Substation site is located in the East Boston Neighborhood District and also within the Eagle Square Waterfront Manufacturing Subdistrict (Exhs. EV-4, at 13; EFSB-Z-1(1)). Section 53-15 and Use Table C specifically prohibit substations in such districts and subdistricts (Exhs. EV-4, at 13; EFSB-Z-12(1), at 96). Accordingly, the Company states that, absent an exemption from these provisions, it would require a use variance to construct the Substation on the proposed site (Exh. EV-4, at 13).

Channel Fish states that the express prohibition against electric substations in a Water Manufacturing Subdistrict is intended to protect the working waterfront and maritime industrial uses, and "exists to prevent the exact situation Eversource is proposing here" (CF Brief at 59). Channel Fish asserts that no Siting Board precedent exists for granting a zoning exemption that would allow in a particular zoning district a use that the municipality has expressly prohibited in that district (id.).

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143 Initially, the Company stated that it sought this exemption to preclude any possibility that the BRA could use its Recommendation to condition or deny the Project (Exh. EV-4, at 14). As discussed below, the Company subsequently changed its position, and now states that its sole reason for seeking exemption from Section 53-13 is to preclude the possibility of a zoning-based appeal of the BRA Recommendation for the Project (Company Brief at 143-144).

The Siting Board finds the Company has demonstrated that, absent the grant of a variance from Section 53-15 and Table C of the Boston Zoning Code, the Substation could not be constructed on the proposed site without a use variance. The Siting Board recognizes the legal difficulty of obtaining variances from local zoning codes, and in particular, exemptions from use restrictions.[144] The Siting Board accordingly grants the Company's request for exemption from the use restrictions in Section 53-15 and Use Table C of the Boston Zoning Code.[145]

ii. Section 53-13

Portions of the Company's proposed Project are located in filled tidelands and within the Chelsea Creek DPA, both of which are areas subject to jurisdiction under Chapter 91 (Exh. EFSB-Z-10(1), at 16). Accordingly, the Project requires a Chapter 91 license (Exhs. EFSB-EV-4, at 13-14 and exh. A at 10; EFSB-Z-10).[146]

The BRA plays a role in reviewing Chapter 91-jurisdictional projects, such as the Project here, under two separate provisions of law – one statutory, under Chapter 91, and one regulatory, under the Boston Zoning Code. Under Section 18 of Chapter 91, the BRA must review the Project and submit to MassDEP during the Chapter 91 licensing process a recommendation stating "whether and why the [BRA] believes the project would serve a proper public purpose

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144 See, Exh. EV-4, at 16-17; Company Brief at 141-143.

145 Where, as here, a proposed use is specifically prohibited by local zoning, the Siting Board is particularly cognizant of the impact on municipal home rule authority of granting an exemption that would allow the use. However, as discussed in Section VII.A.4.c, below, the City of Boston has endorsed granting Eversource's zoning exemption requests, including the requested exemption from the use restrictions in Section 53-13 and Use Table C. Accordingly, the granting this exemption does not raise the type of home rule concerns that would be presented by granting a use exemption where the host municipality either opposes or is silent with respect to the exemption.

146 The proposed Substation, and the cables connecting the Substation to East Eagle Street, would be located in filled tidelands and within the Chelsea Creek DPA, and thus require a new MassDEP Chapter 91 License. It is this portion of the Project, only, that is the subject of the Company's November 19, 2014 MassDEP Chapter 91 License Application (Exh. EFSB-Z-10 (1), at 16).

and would not be detrimental to the public's rights in Tidelands" (a "Section 18 Recommendation"). G.L. c. 91, § 18; 310 CMR 9.13 (5); Exh. EV-4, at 14 and exh. A at 10. The City of Boston, in Section 53-13 of its Zoning Code, has promulgated substantive standards to be used by the BRA in developing a Section 18 Recommendation ("Section 53-13 Standards"). The Company seeks exemption from the review provided for under Section 53-13.

The Company has changed its basis for seeking exemption from Section 53-13 over the course of the proceeding. The Company's initial explanation for seeking an exemption, set forth in its Zoning Petition, was based on the Company's belief that Section 53-13 may give the BRA not only the authority to issue a Section 18 Recommendation for tidelands projects, but authority to condition, and even to deny, such projects (Exh. EV-4, at 14). The Company stated that, should the BRA adversely condition or deny the Project, the Company would be required to seek a variance from the Board of Appeal or challenge the BRA's decision "in the manner provided in the Zoning Code" (id.).

During the proceeding and in briefing, however, Eversource subsequently stated that its "sole reason" for seeking an exemption from Section 53-13 is to eliminate the possibility that a third party with standing could appeal the BRA's Section 18 Recommendation via the Zoning Code"; the Company asserts that any appeal of the BRA's Section 18 Recommendation should occur under Chapter 91 only (Company Brief at 143-144). The Company expressly stated that an exemption from Section 53-13 "would just eliminate the possibility that the Recommendation could be appealed through the zoning process" and that "[t]here are no other bases" for the Company's request for exemption from Section 53-15 (Exh. EFSB-Z-15). In further clarification of the scope of its request for exemption from Section 53-13, the Company stated that the Project would be capable of meeting the Section 53-13 Standards; that it is not seeking to prevent the BRA from issuing a Section 18 Recommendation for the Project; and that it is not seeking to prevent the BRA from using the Section 53-13 Standards as the basis for its Recommendation (Company Brief at 143-144).

Channel Fish asserts that Eversource "has no legitimate reason" to seek relief from Section 53-13 (CF Brief at 58). Channel Fish states that the public would benefit from BRA review of the Project from a waterways perspective (id.).

As a preliminary matter, the Siting Board agrees with Channel Fish that BRA review is an important part of MassDEP's Chapter 91 review and the City of Boston's municipal review of proposed tidelands projects in the East Boston Neighborhood District. Any exemption granted from Section 53-13 must not infringe in any way on the BRA's ability to review the Project.

Granting the Company's requested exemption from Section 53-13 would not eliminate or infringe upon the BRA's ability to review the Project. Wholly apart from the Zoning Code, the BRA has an independent statutory right under Chapter 91 to review the Project and provide MassDEP with a Section 18 Recommendation. G.L. c. 91, § 18. Thus, irrespective of whether an exemption from Section 53-13 is granted here, the BRA will retain the right, as part of the Chapter 91 licensing process, to provide a written statement to MassDEP regarding whether and why, in the BRA's view, the proposed Project would serve a proper public purpose and would not be detrimental to the public's rights in tidelands. The BRA may, to the extent that it deems appropriate, use the Section 53-13 Standards in developing its Recommendation.

The Company's request for exemption from Section 53-13 is unusual, in that it does not seek exemption from compliance with Section 53-13. The Company has not asserted that the substantive criteria of Section 53-13 are unclear or ambiguous; it has, in fact, asserted that the Project can meet these criteria. The Company also has asserted that it has no objection to the use of the criteria by the BRA. The Company is seeking exemption from Section 53-13 only to preclude a possible appeal of the BRA's Section 18 Recommendation through the local zoning process.[147]

The Siting Board finds that exemption from Section 53-13 of the Boston Zoning Code is required to allow construction and operation of the proposed Project within the meaning of G.L. c. 40A, §3. If the BRA Section 18 Recommendation for the Project is, in fact, appealable both under the Boston Zoning Code and in the course of the Chapter 91 licensing process, the possibility exists that delay in Project permitting could result that is greater than if the

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147 The Company did not expressly articulate its reason for seeking elimination of such an appeal, other than indicating that such an appeal is more correctly brought under Chapter 91 (Company Brief at 145-146).

Recommendation were appealable in one forum only.[148] Additionally, and critically, BRA review of the Project, including the issuance of a Section 18 Recommendation, will occur in this case under Chapter 91, irrespective of whether the Project is exempted from Section 53-13 of the Zoning Code.

The Company's request for exemption from Section 53-13 of the City of Boston Zoning Code is granted. Implementation of this exemption shall be consistent with Eversource's representations in this proceeding. Specifically, the exemption shall not render the Standards in Section 53-15 inapplicable to the Project, and shall not prevent the BRA from using the Standards in its review of the Project and issuance of a Section 18 Recommendation for the Project under Chapter 91.

iii. Section 53-17

Section 53-17 provides that a project located within tidelands and involving new construction at grade must devote to "open space" at least 50 percent of the project's lot area (Exh. EV-4, at 14, and exh. A at 18). The Company stated that the Zoning Code "does not define what types of structures would result in detraction of open space" (Exh. EV-4, at 15). The Company states that certain Project structures, such as the control enclosure and paved areas, would detract from open space; the Company states that it is less clear if features like the gas-insulated switchgear, transformers, and capacitors would result in detraction of open space (id.). The Company states that because of this ambiguity, it is not possible to determine whether the open-space requirement in Section 53-17 would be met and, accordingly, that to ensure the

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148 The Company does not assert, or provide legal support for, the proposition that a Section 18 Recommendation by the BRA is appealable under both the Boston Zoning Code and Chapter 91. The Company states only that the possibility of such appeals may exist. A properly drafted zoning exemption petition substantiates an applicant's assertions regarding the operation of a local zoning ordinance and relevant statutes, including whether and how appeals of agency actions may be brought. In this case, information and statutory or regulatory citations regarding the appealability of a BRA Section 18 Recommendation under the Boston Zoning Code or under Chapter 91 were lacking. In the future, exemption requests lacking this evidentiary support may be denied.

Project's compliance with the Zoning Code, the Company would need to seek a variance from this Section (id.).

Channel Fish asserts that the record shows clearly that the Project cannot comply with the 50 percent open-space requirement of Section 53-17. Channel Fish asserts that allowing the placement of the Substation so close to the high water mark (12 feet at the closest location) would foreclose any extension of the Harborwalk (CF Brief at 59-60).

The relatively small size of the Substation site, the amount of electrical equipment and number of structures required for Substation operation, and the ambiguity in the Zoning Code regarding what constitutes open space combine to preclude Eversource from meeting the 50 percent open space requirement on the Substation site. Additionally, we note that the primary purpose of Section 53-17, for privately-owned property, appears to be the preservation of land for recreation. Irrespective of how much "open space" might be achievable within the footprint of the East Eagle Substation, no recreational purpose would be served: to the contrary, the Company will be required to implement security measures at the Substation site, as at all of its substation sites, designed specifically to prevent public access, for reasons of public health and safety (Exh. EFSB-Z-10(1), at 23).

The Siting Board finds that exemption from the provisions of Section 53-17 of the Boston Zoning Code is required for construction and operation of the proposed Project within the meaning of G.L. c. 40A, §3, and grants the exemption.

iv. Section 53-18

Section 53-18 of the Boston Zoning Code requires a "waterfront yard area" of 35 feet adjacent to and landward of the high tide line for projects located in tidelands (Exh. EV-4, at 15, and exh. A). This Section specifically provides that no portion of any building or structure may be located in a waterfront yard area (id.).

The Company acknowledges that portions of the Substation site are located within the waterfront yard area, including the site fence and certain transmission and distribution components of the Project (id.). The Company states that it cannot comply with the waterfront yard area setback requirement, because the small size of the Substation site makes it impossible

to move the Substation's fenceline or its transmission and distribution components out of the waterfront yard area (Exh. EV-4, at 15-16). The Company asserts that the facility components that would be located within this area are minimal and will not interfere with public rights in tidelands (Company Brief at 145).

The Siting Board finds that exemption from the Section 53-18 of the Zoning Code is required for construction and operation of the proposed Project within the meaning of G.L. c. 40A, §3, and the exemption is granted.

v. Section 11-2(b)

Section 11-2 of the Boston Zoning Code regulates on-premise signs; Section 11-2(b) allows only one wall sign (Exhs. EV-4, at 16; EFSB-Z-11). The Company states that the Substation site will have multiple signs (Exh. EV-4, at 16). The site will be surrounded by fencing on which signs, approximately one-foot square, will be posted at intervals (id.). These signs will identify the Company as the owner of the site; warn of the presence of high voltage electrical equipment; and provide emergency contact information (id.). The Company also will place "substation safety signs," approximately three-foot square, at each site access point. These signs "will provide safety reminders to persons entering the enclosure" (id.).

The Company notes that Section 11-2(g) of the Zoning Code provides an exception to the one-sign limitation of Section 11-2(b) for "directional" signs necessary for public safety and convenience that do not exceed twelve-foot square per side (id.). The Company states that if its signs do not qualify as directional signs, only one sign would be permitted under Section 11-2(b), and the Company would need to seek a variance for the remaining signs (id.). The Company seeks an exemption from Section 11-2(b) "to the extent that the proposed signs are not allowed as directional signs" (id.).

The Siting Board finds that exemption from the Section 11-2(b) of the Zoning Code is required for construction and operation of the proposed Project within the meaning of G.L. c. 40A, §3, and the exemption is granted.

c. Consultation with the Municipality

The Siting Board favors the resolution of local issues on the local level whenever possible to reduce local concern regarding any intrusion on home rule authority. Thus, the Siting Board encourages zoning exemption petitioners to consult with local officials, and in some circumstances, to apply for local zoning permits, prior to seeking zoning exemptions from the Department under G.L. c. 40A, § 3. NSTAR Seafood Way at 36-37; Russell Biomass LLC/Western Massachusetts Electric Company, EFSB 07-4/.D.P.U. 07-35/07-36, at 60-63 (2009) ("Russell").

Channel Fish asserts that Eversource has not met the Russell criteria relative to consultation with the municipality. Specifically, Channel Fish states that variances are available, there is no evidence of the City's unwillingness to grant zoning relief, and there is no evidence of substantial public harm should the exemptions not be granted (CF Reply Brief at 33-34). Channel Fish asserts that the Company, by its own admission, has not met with the BRA regarding the Project since November 2014 (CF Reply Brief at 32, citing Company Brief at 11, and Exhs. EFSB-G-8; EFSB-G-8(R1); EFSB-RR-68; EFSB-RR-70; EFSB-RR-79). Channel Fish characterizes the Company's requests for exemption from local zoning in general as an "attempt to evade any meaningful review by appropriate City authorities" (CF Brief at 57).

The Company disputes Channel Fish's characterization of its zoning exemption requests, as well as Channel Fish's factual assertions regarding the insufficiency of the Company's level of interaction with City of Boston authorities. The Company asserts that its municipal interactions satisfy the Russell standard (Company Brief at 139-140; Company Reply Brief at 53-54).

The Company states that it had "many" conversations with "numerous" officials of the City of Boston, as well as with the cities of Chelsea and Everett, regarding the Project and the Company's petition to seek zoning exemptions from the Department (Exhs. EV-2, Section 1; EV-4, at 5; Company Brief at 11 and 140, citing Exhs. EFSB-G-8; EFSB-G-8(R1); EFSB-RR-68; EFSB-RR-70; EFSB-RR-79). The Company characterizes its contacts with the City as a "significant and substantive" ongoing dialogue with relevant City agencies, "to ensure that the Substation comports with both the City's plans for its abutting property and the surrounding

neighborhood" (Company Reply Brief at 54). The Company notes that the City conveyed the Substation parcel to the Company in full knowledge of the intended use for the site, and that in the conveyance agreement between the City and the Company, the City agreed not to oppose any required permits or approvals for the Project (id.; Company Brief at 140, citing Exh. CF-3(1) at 10-11). The Company notes that the City, through the Commissioner of the City's Inspectional Services Department, issued a letter to the Company in 2015, specifically "confirming that the City supports the DPU's granting of the individual and comprehensive exemptions for Eversource's Project" (Exh. EFSB-Z-7(S-1)(1)). The Company also has solicited and responded to Project-related concerns of other interested parties, including neighborhood organizations and local environmental advocacy organizations (Exhs. EFSB-Z-9; EFSB-G-14 through G-18; Company Brief at 11, citing Exhs. EFSB-G-8; EFSB-G-8(R1); EFSB-G-14; EFSB-G-15; EFSB-G-16; EFSB-G-16(1); EFSB-G-17; EFSB-G-18; EFSB-RS-8; EFSB-RR-75). The Company has stated that it will continue to communicate with the City and interested parties throughout the permitting and construction of the Project (Exh. EV-4, at 6).

Channel Fish's assertion that the Company has failed to meet the Russell standard with respect to consultation with the City of Boston is not supported by the record. In Russell, the Siting Board "set forth an approach" for public service corporations to use in seeking local zoning exemptions. Russell at 62. In summary, the Siting Board stated that unless consultation with a municipality would be futile, "it is our expectation that a project proponent will make a good faith effort to consult with local zoning authorities and apply for necessary zoning approvals or other relevant relief, as appropriate.". Id. As clarified in subsequent Department and Siting Board decisions, the Russell standard is met where an applicant demonstrates that it made a good faith effort to consult with municipal authorities regarding a proposed project, specifically, regarding the applicant's intention to seek local zoning exemptions for the project from the Department. Worcester at 75-77; NSTAR Seafood Way at 37. Based on the record in this proceeding, the Siting Board finds that Eversource has engaged in good-faith consultations with the City of Boston regarding the Project, consistent with Russell.

d. Conclusion on Requests for Individual Zoning Exemptions

As described above, the Siting Board has found that: (1) Eversource is a public service corporation; (2) the proposed Project is reasonably necessary for the public convenience or welfare; and (3) the five requested individual zoning exemptions are required for Project construction and operation within the meaning of G.L. c. 40A, § 3, and Section 6 of Chapter 665 of the Acts of 1956. Additionally, the Board has found that Eversource has engaged in good-faith consultations with the City of Boston, consistent with the Siting Board's approach in Russell. Accordingly, the Siting Board grants the five individual zoning exemptions requested by Eversource: Section 53-15 and Use Table C; Section 53-13; Section 53-17; Section 53-18; and Section 11-2(b) of the City of Boston Zoning Code.[149]

B. Comprehensive Zoning Exemption

1. Standard of Review

The Company has requested a comprehensive exemption from the Boston Zoning Code. The Siting Board will grant such requests on a case-by-case basis where the applicant demonstrates that issuance of a comprehensive exemption could avoid substantial public harm by serving to prevent a delay in the construction and operation of the proposed use. NRG Canal 3 Development LLC, EFSB 15-06/D.P.U. 15-180, at 155 (2017) ("NRG"); NSTAR Seafood Way at 37-38; Salem Cables at 99; Worcester at 81.

In order to make a determination regarding substantial public harm, the Department and the Siting Board have articulated relevant factors, including, but not limited to, whether: (1) the proposed project is reliability-based; (2) the project is time-sensitive; (3) the project involves multiple municipalities that could have conflicting zoning provisions that might hinder the uniform development of a large project spanning these communities; (4) the proponent of the project has actively engaged the communities and responsible officials to discuss the applicability of local zoning provisions to the project and any local concerns; and (5) the affected

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149 The exemptions are granted to the extent described in Section VII.A.4.b, above.

communities do not oppose the issuance of the comprehensive exemption. NRG at 156; Salem Cables at 99; NSTAR Seafood Way at 39.

2. Positions of the Parties

The Company seeks a comprehensive exemption from Articles 1 through 25 and Article 53 of the Zoning Code (Exh. EFSB-Z-20). The Company asserts general, rather than Project-specific reasons in support of its view that the Project satisfies the Department's and Siting Board's standards for the grant of a comprehensive exemption (Company Brief at 148). The Company asserts that project-permitting uncertainty is reduced if a project is exempted entirely from compliance with local zoning (id.). The Company asserts that a comprehensive exemption: (1) eliminates any uncertainty regarding the applicability of individual provisions of the zoning code to a proposed project, both those provisions currently in effect and any provisions that may be enacted subsequently; and (2) allows for project modifications in the future, without the need to determine whether the changes are subject to local zoning requirements and, if they are, without the need to seek either local zoning approval or a zoning exemption from the Siting Board (id.; Exh. EV-4, at 19-22). The Company states that a comprehensive exemption "would ensure the timely construction of this important reliability Project, which will directly benefit customers" (Company Brief at 148).

Channel Fish opposes the granting of any zoning exemptions for the Project, including a comprehensive exemption. Channel Fish asserts that the Siting Board "should refuse to grant Eversource's requested zoning relief and instead require the Company to fully engage with the appropriate City departments to allow for a complete evaluation of the project's impacts" (CF Brief at 62).

3. Analysis and Findings

As evaluated in Sections II and III, above, the record shows that there is a need for additional transmission resources in the Chelsea/East Boston/Lynn Load Area in order to avoid potentially excessive loss of load. Without the Project, the record shows that the loss of two area transmission lines could lead to power outages for over 87,000 customers in Chelsea,

East Boston, Winthrop, Nahant, Revere, Lynn, Saugus, and Swampscott – including Logan International Airport. The record shows that peak electrical demand in this area exceeded ISO-NE's recommended 300 MW interruption limit in 2013, and is forecast to exceed this level over ISO-NE's 2018 to 2023 planning horizon. In addition, the record shows that there is an existing need for additional substation capacity in the smaller Chelsea-East Boston area. The record shows that, without the Project, under certain circumstances, Eversource would be unable to supply all of its customers served from the Chelsea Substation with continuous power. Accordingly, we find that construction and operation of the proposed Project is time-sensitive, as delay in Project completion could have significant adverse consequences for a large number of Eversource and National Grid customers.

The record additionally shows (1) that the Company has actively engaged with the City of Boston and responsible officials to discuss the applicability of local zoning provisions to the Project and any local concerns; and (2) that the City of Boston supports the granting of both individual zoning exemptions and a comprehensive zoning exemption for the Project.

Accordingly, the Siting Board finds that the issuance of a comprehensive zoning exemption in this case could avoid substantial public harm by serving to prevent a delay in the construction and operation of the proposed Project. The Company's request for a comprehensive exemption from Articles 1 through 25 and Article 53 of the City of Boston Zoning Code, for the Project as described, is granted.[150] See Hopkinton at 40.

VIII. 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

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150 The Company specified that it seeks exemption from these Articles only (Exh. EFSB-Z-20).

> 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.[151]

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). 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); 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 II through V, 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 Board in Section X, below, the Siting Board finds pursuant to G.L. c. 164, § 72 that the Project is necessary for the

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[151] 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.

purpose alleged, would serve the public convenience, and is consistent with the public interest. Thus, the Siting Board approves the Section 72 Petition.

IX. SECTION 61 FINDINGS

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 CMR 11.01(3), these findings are necessary when an Environmental Impact Report ("EIR") is submitted by a petitioner to the Secretary, and should be based on such EIR. Where an EIR is not required, G.L. c. 30, § 61 findings are not necessary. 301 CMR 11.01(3).[152]

In this case, the record indicates that the Project did not require the filing of an Environmental Notification Form with the Secretary, and consequently did not require submittal of an EIR (Exh. EV-3, exh. F). Accordingly, Section 61 findings are not necessary for the Project.

X. DECISION

The Siting Board's enabling statute directs the 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 II.E, above, the Siting Board finds that additional energy resources are needed to maintain a reliable supply of electricity in the Chelsea/East Boston/Lynn Load Area.

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[152] 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 III.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 IV, 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.

In Section V.F, above, the Siting Board finds that the proposed Project along the Primary Route would be superior to the proposed Project along 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.

In Section V.F, 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 would be minimized.

In Section VI, above, the Siting Board finds that with the implementation of specified mitigation and conditions, the Project is consistent with the health and safety, environmental protection, 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 S.

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 City of Boston Zoning Code, as enumerated in Section VII.A.4.d, above.

In Section VII.B.3, the Siting Board approves Eversource's Petition for comprehensive exemption from the City of Boston Zoning Code.

Accordingly, the Siting Board approves the Company's Petition to construct the Project using the Primary Route, as described herein, subject to the following Conditions A through S.

A. The Siting Board directs the Company to enter into discussions with the City of Boston, focusing on the ability of the Company to relocate the East Eagle Substation on the City Parcel and to acquire an easement across the City Parcel, if necessary, for the installation of the New Lines, and to provide an update to the Board on the status of such discussions (preferably, including a letter from the City of Boston regarding its position), within six months of this Final Decision, and prior to the commencement of any construction on the City Parcel.

B. The Siting Board directs the Company to limit Project construction to Monday through Saturday from 7:00 a.m. to 6:00 p.m., with the following specific schedule modifications: (1) construction from 6:00 p.m. to 3:00 a.m., Monday through Saturday on Dexter Street, Robin Street (with the exception of Lynde to Courtland where daytime construction is to be performed), Beacham Street and Williams Street; (2) construction from 7:00 a.m. to 6:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. Saturday for Williams Street and Marginal Street from Spruce Street to Shawmut Street, with the exception of peak travel periods; (3) nighttime construction from Shawmut Street to Willow Street, hours to be determined by the City of Chelsea; (4) construction from 9:30 a.m. to 3:30 p.m. Monday through Friday, and 9:00 a.m. to 5:00 p.m. Saturday, if Saturday construction is approved by the City of Boston, on roadways in and around the East Eagle Street neighborhood; and (5) construction from 7:00 p.m. to 6:00 a.m. on Alford Street, which must be coordinated with any work by Wynn Casino.

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 Company is directed 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 approval from the Siting Board and shall provide the relevant municipality with a copy of any such request.

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 Board. The Company shall also send a copy to the Siting Board, within 72 hours of receipt, of any authorization for an extension of work hours by a municipality. 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 municipality, work that continues past such allowed hours, and must submit such record to the Board within 90 days of Project completion.

C. The Siting Board directs the Company to provide 24-hour emergency access to all abutting businesses.

D. The Siting Board directs the Company to provide two-way traffic access to the extent practicable, such that when businesses along the Primary Route are open for business, two-way traffic is not blocked.

E. The Siting Board directs the Company to submit to the Siting Board a copy of the staging plan prior to commencement of Project construction. The staging plan should include a prohibition on equipment storage on roadways at the end of each work shift, and details of where construction equipment would be stored and construction workers would park for the duration of Project construction.

F. The Siting Board directs the Company during November 15 through April 15 to confirm with the cities on a weekly basis to receive approval to conduct work during this period.

G. The Siting Board directs the Company to provide a twice-monthly report to all parties to this proceeding itemizing any and all complaints about construction practices and procedures, including proper location of steel plating, and the resolution of such items.

H. Siting Board directs that any notifications include all abutting landowners and lessees. In addition, the Company shall notify all abutting landowners and lessees not less than 30 days before Project construction begins, and again not less than seven days before construction is scheduled to begin directly adjacent to the affected property.

I. The Siting Board directs the Company, in consultation with Everett, Chelsea, and Boston, to develop a separate, comprehensive outreach plan for the Project that incorporates Conditions B, C, D, E, F, H, and I. 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 of upcoming construction.

J. The Siting Board directs the Company to submit the final TMP to the Board and all other parties no less than one month prior to the commencement of construction, and to publish the TMP on the Company's Project website.

K. The Siting Board directs the Company to provide curb-to-curb repaving on all streets along the Mystic-East Eagle route following completion of the Mystic-East Eagle Line.

L. The Siting Board directs the Company prior to the start of Project construction to provide the Board and all parties copies of the results from soil pre-characterization activities performed by the Company or its contractor.

M. The Siting Board directs the Company to use portable noise barriers when working at nighttime at the proposed manhole location near Robin and Lynde Streets in Everett.

N. The Siting Board directs Eversource to enter into discussions with the City of Boston regarding the potential for the Company to develop a landscaping plan including the planting of the ten trees on the City Parcel. Should the City of Boston indicate its support for such plantings, the Company is directed to file with the Siting Board a mutually agreed upon landscaping plan within one year of the issuance of this Decision, laying out at a minimum the type, location, and timing of the proposed plantings. Should the City of Boston support Company funded landscaping on the City Parcel, but prefer not to commit to any specific actions prior to the finalization of its redevelopment plans for the parcel, the Company, in consultation with the City of Boston, is directed to file with the Siting Board: (1) plans for planting ten trees elsewhere in East Boston within one year of the issuance of this Decision; and (2) an annual progress report on the development of its landscaping plan. Any annual progress reports are to be filed with the Board until a final landscaping plan is prepared, or for a five year period following completion and initial operation of the Project, whichever is sooner. If five years after Project completion a final landscaping plan has not yet been prepared, the Company is to consult with the Siting Board to determine whether the Board will require continued reporting or other actions, as it deems appropriate. Finally, if the City of Boston does not support Company funded landscaping on the City Parcel, the Company is directed to file with the Siting Board plans for tree planting elsewhere in East Boston, consistent with its commitments to Boston Harbor Now, within six months of the issuance of this Decision.

O. The Siting Board directs Eversource to inform the Board if it adds additional SF_6 to the equipment proposed in association with the Project, or replaces any of said

equipment due to SF_6 loss, 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 Board will require continued reporting, as it deems appropriate.

P. 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.

Q. The Siting Board requires the Company to obtain all permits, licenses and other approvals necessary for construction and operation of the Project, including but not limited to a Chapter 91 License from MassDEP.

R. 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.

S. 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 Boston, City of Everett and City of Chelsea; the Planning Boards of Everett and Chelsea and the Boston Redevelopment Authority; and the Zoning Board of Appeals of each city 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.

M. Kathryn Sedor

M. Kathryn Sedor
Presiding Officer

Dated this 1st day of December 2017

Unanimous vote by the Energy Facilities Siting Board at its meeting on November 30, 2017, by the members present and voting. Voting for the Tentative Decision as amended: Matthew A. Beaton, Secretary of the Executive Office of Energy and Environmental Affairs, EFSB Chairman; Angela M. O'Connor, Chairman of the Department of Public Utilities; Cecile M. Fraser, Commissioner of the Department of Public Utilities; Judith Judson, Commissioner of the Department of Energy Resources; Gary Moran, Deputy Commissioner and designee for the Commissioner of MassDEP; Jonathan Cosco, Senior Deputy General Counsel and designee for the Secretary of the Executive Office of Housing and Economic Development; Glenn Harkness, Public Member; Mark C. Kalpin, Public Member; Joseph Bonfiglio, Public Member.

Matthew A. Beaton, Chairman
Energy Facilities Siting Board

Dated this 1st day of December 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.