COMMONWEALTH OF MASSACHUSETTS
ENERGY FACILITIES SITING BOARD

Petition of New England Power Company d/b/a National Grid Pursuant to G.L. c. 164, § 69J for Approval to Construct a New 115 kV Underground Cable in the Cities of Salem and Beverly and a New Switching Station in Salem and to Modify Two Existing Substations in Beverly, Massachusetts	EFSB 19-04
Petition of New England Power Company d/b/a National Grid Pursuant to G.L. c. 164, § 72, for Approval to Construct and Use a New 115 kV Underground Cable in the Cities of Salem and Beverly, Massachusetts	D.P.U. 19-77
Petition of New England Power Company d/b/a National Grid Pursuant to G.L. c. 40A § 3, for Individual and Comprehensive Exemptions from the Zoning Ordinances of the Cities of Salem and Beverly, Massachusetts	D.P.U. 19-78

FINAL DECISION

On the Decision:

Enid Kumin
John Young

Robert J. Shea
Presiding Officer
October 8, 2021

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ABBREVIATIONS

2017 EJ Policy	A prior version of the Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs, dated January 31, 2017
2021 EJ Policy	The Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs, dated June 24, 2021
Andrew-Dewar	NSTAR Electric Company d/b/a Eversource Energy, EFSB 19-03/D.P.U. 19-15 (2021)
AUL	Activity and Use Limitation (under the MCP)
Berkshire Power	Berkshire Power Development, Inc., D.P.U. 96-104 (1997)
Beverly/Cape Ann Area	Beverly, Wenham, Hamilton, Essex, Manchester-by-the-Sea, Gloucester, and Rockport
Beverly MOA	memorandum of agreement between NEP and the City of Beverly
BMPs	best management practices
Boston Gas	Boston Gas Company, D.T.E. 00-24 (2001)
Braintree	Planning Board of Braintree v. Department of Public Utilities, 420 Mass. 22 (1995)
BVW	bordering vegetated wetland
CCVT	capacitor coupled voltage transformer
CMR	Code of Massachusetts Regulations
Company	New England Power Company d/b/a National Grid
dBA	A-weighted decibels
Department	Massachusetts Department of Public Utilities
DOMSB	Decisions and Orders of Massachusetts Energy Facilities Siting Board
East Eagle	NSTAR Electric Company d/b/a Eversource Energy, EFSB 14-04/D.P.U. 14-153/ 14-154 (2017)
EFSB	Massachusetts Energy Facilities Siting Board

ABBREVIATIONS

EJ	environmental justice
Electric Avenue	NSTAR Electric Company, D.P.U. 13-126/13-127 (2014)
EMF	electric and magnetic fields
Existing Cable	existing N-192 Cable
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
G.L. c.	Massachusetts General Laws chapter
GSRP	Western Massachusetts Electric Company, 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, EFSB 10-1/D.P.U. 10-107/10-108 (2012)
Hopkinton	NSTAR Electric Company, D.P.U. 15-02 (2015)
HPPT	high pressure pipe-type (cable system)
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IRP	New England Power Company d/b/a National Grid, EFSB 12 1/D.P.U. 12-46/12-47 (2014)
ISO-NE	ISO-New England
King Street Alternative	building transmission to the area from King Street Substation in Groveland
kV	kilovolt
LSCSF	Land Subject to Coastal Storm Flowage
Lower SEMA	NSTAR Electric Company, EFSB 10-2/D.P.U. 10-131/10-132 (2012)
LSP	Licensed Site Professional

ABBREVIATIONS

LUO	Land Under the Ocean
Main Line	MBTA's Eastern Route Main Line track
MassDEP	Massachusetts Department of Environmental Protection
MassDOT	Massachusetts Department of Transportation
MassGIS	Massachusetts Geographic Information System
MBTA	Massachusetts Bay Transportation Authority
MBUAR	Massachusetts Board of Underwater Archeological Resources
MCP	Massachusetts Contingency Plan
MECo	Massachusetts Electric Company
MEPA	Massachusetts Environmental Policy Act
mG	milligauss
MHC	Massachusetts Historical Commission
MODF	mineral oil dielectric fluid
MVA	megavolt-amperes
MW	megawatts
MWh	megawatt-hours
Mystic-Woburn	NSTAR Electric Company d/b/a Eversource Energy, EFSB 15 03/D.P.U. 15-64/15-65 (2017)
NEP	New England Power Company d/b/a National Grid
New Cable	a new approximately 3.73-mile-long 115 kV underground transmission line starting at a proposed new switching station at 10 Waite Street in Salem and ending at the East Beverly #51 Substation
Noticed Alternative Route	NEP's 4.17-mile-long alternative route

ABBREVIATIONS

NPDES	National Pollutant Discharge Elimination System
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)
NWA	non-wires alternative
OSHA	U.S. Occupational Safety and Health Administration
P-50	A cost estimate for which NEP assessed there is a 50 percent probability the Project cost would exceed the estimate
P-80	A cost estimate for which NEP assessed there is a 20 percent probability the Project cost would exceed the estimate
Petitions	NEP's Siting Petition, Section 72 Petition, and Zoning Petition
Primary Route	NEP's preferred route for the New Cable
Project	proposed 115 kV underground transmission line between a new switching station in Salem, the Beverly #12 Substation, and the East Beverly #51 Substation, as well as associated substation construction and upgrades, and existing cable removal
PSC	public service corporation
psi	pounds per square inch
psig	pounds per square inch, gauge
Public Comment Hearing Notice	Notice of Public Comment Hearing/Notice of Adjudication
PVC	polyvinyl chloride
RAM	Release Abatement Measure (310 CMR 40)
ROW	right-of-way
RTN	release tracking number (under the MCP)

ABBREVIATIONS

Russell	Russell Biomass, LLC, EFSB 07-4/D.P.U. 07-35/07-36 (2009)
Salem Cables	New England Power Company d/b/a National Grid, EFSB 13-2/D.P.U. 13-151/13-152 (2014)
Salem MOA	memorandum of agreement between NEP and the City of Salem
Save the Bay	Save the Bay v. Department of Public Utilities, 366 Mass. 667 (1975)
SCFF	self-contained fluid-filled (pressurized cable)
Seafood Way	NSTAR Electric Company, D.P.U. 13-177/13-178 (2015)
Section 72 Petition	NEP petition pursuant to G.L. c. 164, § 72
SF_6	sulfur hexafluoride
Siting Board	Massachusetts Energy Facilities Siting Board
Siting Petition	NEP petition pursuant to G.L. c. 164 § 69J
SJC	Supreme Judicial Court
Sudbury v. EFSB	Town of Sudbury v. Energy Facilities Siting Board, 487 Mass. 737 (2021)
Sudbury-Hudson	NSTAR Electric Company d/b/a Eversource Energy, EFSB 17-02/D.P.U. 17-82/17-83 (2019)
Stoughton/Boston	Boston Edison Company d/b/a NSTAR Electric, EFSB 04-1/D.P.U. 04-5/04-6 (2005)
SWPPP	stormwater pollution prevention plan
TMP	Traffic Management Plan
Town of Truro	Town of Truro v. Department of Public Utilities, 365 Mass. 407 (1974)
Winchester v. EFSB	Town of Winchester v. Energy Facilities Siting Board, 98 Mass.App.Ct. 1101 (2020) (Unpublished Opinion)
Woburn-Wakefield	NSTAR Electric Company d/b/a Eversource Energy, EFSB 15-04/D.P.U. 15-140/15-141 (2018)
ULSD	ultra-low sulfur diesel

ABBREVIATIONS

URAM	Utility-Related Abatement Measure (310 CMR 40.0460)
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
Waite Street Switching Station	proposed new switching station at 10 Waite Street in Salem
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, EFSB 09-1/D.P.U. 09-52/09-53 (2011)
WPA	Wetlands Protection Act
XLPE	cross-linked polyethylene
Zoning Petition	NEP petition pursuant to G.L. c. 40A § 3

SUMMARY OF THE FINAL DECISION

The Final Decision approves with conditions New England Power Company's d/b/a National Grid ("NEP," a National Grid electric transmission entity) proposal to construct a new approximately 3.73-mile-long 115 kV underground transmission line, starting at a proposed new switching station at 10 Waite Street in Salem, crossing in a new conduit on the underside of Veterans Memorial Bridge (Route 1A) over the Danvers River, continuing under streets in Beverly and connecting to the existing Beverly #12 Substation, and then continuing under streets and connecting to the existing East Beverly #51 Substation. NEP would also upgrade the two existing substations in Beverly.

The New Cable would replace the existing N-192 Cable, an oil-filled, direct-buried underground cable installed in the 1970s in an active MBTA commuter rail right of way. The Existing Cable is obsolete, leak-prone, and currently out of service due to multiple recent unresolved leaks. Its location in an active rail right of way constrains work hours for repair activity and adds significant safety and complexity challenges. After the New Cable is energized, the Existing Cable would be removed and all affected roads repaired/repaved. The Final Decision requires that NEP implement certain measures to minimize construction and operational impacts in neighborhoods along the Project route. The Final Decision finds that the Project would, on balance, contribute to a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Recently, the need for replacing the Existing Cable has become acute, as the Existing Cable has been out of service since April 6, 2021, and will remain so until damage has been repaired, likely toward the end of 2021. The Siting Board considered alternatives to the Project, including non-wire alternatives and various transmission alternatives. The Final Decision finds that the Project is superior to all alternatives in meeting the identified need with minimum impact on the environment at the lowest possible cost.

The Siting Board reviewed the Primary and Noticed Alternative Routes on the basis of cost, constructability, and environmental impacts. The Final Decision finds that the Primary Route and the Noticed Alternative Route would have comparable land use, visual, air, safety, and magnetic field impacts. The Primary Route, however, would have lower noise, hazardous waste, and traffic impacts than the Noticed Alternative Route. The Siting Board attributes the advantages of the Primary Route to its shorter length and to the fact that the Primary Route would generally traverse less congested streets compared to the Noticed Alternative Route. Consequently, the Final Decision finds that the Primary Route would be superior in providing a reliable energy supply with a minimum impact on the environment at the lowest possible cost. With the addition of several conditions, the Final Decision finds that environmental impacts of the Project would be minimized.

The Final Decision also finds that construction of the Project would be consistent with current health, environmental protection, and resource use and development policies as adopted by the Commonwealth. In addition, the Final Decision finds that the requested zoning exemptions are required for construction and operation of the Project.

Pursuant to G.L. c. 164, § 69J, the Massachusetts Energy Facilities Siting Board ("Siting Board") hereby approves, subject to the conditions set forth below, the Petition of New England Power Company d/b/a National Grid ("NEP" or "Company") to replace the existing N-192 Cable in the cities of Salem and Beverly by constructing, operating, and maintaining a new 115 kilovolt ("kV") underground cable in Salem and Beverly; constructing a new switching station in Salem; upgrading the Beverly #12 and East Beverly #51 Substations; and removing the existing N-192 Cable (together, the "Project"). Pursuant to G.L. c. 164, § 72, the Siting Board hereby approves, subject to the conditions set forth below, the Petition of NEP for a determination that the proposed transmission line is necessary, serves the public convenience, and is consistent with the public interest. Pursuant to G.L. c. 40A, § 3, the Siting Board hereby approves, subject to the conditions set forth below, the Petition of NEP for individual and comprehensive zoning exemptions from the Beverly and Salem Zoning Bylaws in connection with the proposed facilities, as described herein.

I. INTRODUCTION

A. Description of the Proposed Project

NEP proposes to construct a new approximately 3.73-mile-long 115 kV underground transmission line ("New Cable") starting at a proposed new switching station at 10 Waite Street in Salem ("Waite Street Switching Station"), which it will tap off the existing overhead 115 kV line at that location (Exhs. NG-2, at 5; EFSB-G-10; Tr. 1, at 13, 158-159). The New Cable would extend 1.0 miles from the Waite Street Switching Station, first under city streets in Salem, then crossing in a new conduit on the underside of Veterans Memorial Bridge (Route 1A) over the Danvers River, and continuing under streets in Beverly and connecting to the existing Beverly #12 Substation; it would continue another 2.73 miles, connecting to the existing East Beverly #51 Substation (Exhs. NG-2, at 5, fig. 1-1; EFSB-G-8).

The New Cable would replace the existing N-192 Cable ("Existing Cable") (Exh. NG-2, at 1). After the New Cable is energized, the Existing Cable would be de-energized; and both the Existing Cable and related equipment would be removed (id.). The routes of the Existing Cable and the New Cable would be distinct except for a short segment near the Beverly #12 Substation

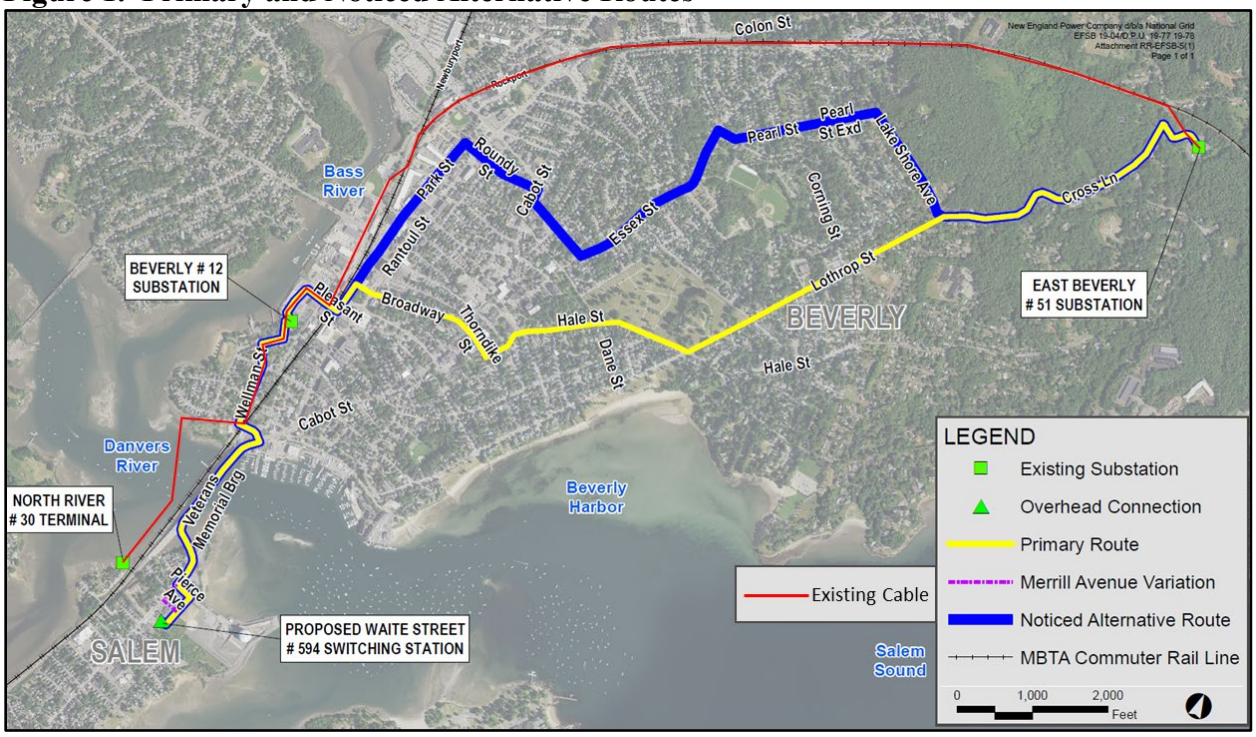
(id. at 1, fig. 1-1).

The new Waite Street Switching Station would include a 115 kV riser structure, an H-frame structure, a circuit switcher, buswork, and a control house (Exh. NG-2, at 6). At Beverly #12 Substation, the Company would install a 115 kV circuit breaker, a second 115 kV/13.2 kV transformer, various support structures, and 13.2 kV equipment (id. at 5-6). At East Beverly #51 Substation, the Project would include installation of new support structures and switches as well as removal of existing support structures and switches and cable fluid reservoirs (id.).

The Company's preferred route for the New Cable ("Primary Route") is shown in Figure 1, below. For the Danvers River crossing, the New Cable would be placed on the underside of the Veterans Memorial Bridge (Route 1A) (Exh. NG-2, at 1). For most of its length, the New Cable would be installed within six-inch-diameter conduits in a duct bank, the top of which would typically be 30 inches below roadway surfaces (id. at 82; EFSB-G-11).[1] The duct bank would contain a total of six conduits: three six-inch diameter conduits for the 115 kV cables; one four-inch diameter conduit for relay and communication cable; and two two-inch diameter conduits for a ground conductor and a possible future temperature monitoring cable (Exh. NG-2, at 82).

[1] The Company indicated that the typical depth of the trench from the road surface to the bottom of the excavation would be 58 inches and the maximum depth would be 180 inches (Exh. EFSB-G-11; Tr. 1, at 28). The minimum trench width would be 27 inches; the typical trench width would be 32 inches; the maximum width of the trench would be 48 inches (Exhs. EFSB-G-11; EFSB-G-21). The minimum, and typical, width of the duct bank would be 27 inches (Exh. EFSB-G-11). The maximum width of the duct bank would be 48 inches (Exh. EFSB-G-21). The Company indicated that the construction plans could change based on consultations with Salem and Beverly officials (Exh. EFSB-G-11; Tr. 1, at 27).

Figure 1. Primary and Noticed Alternative Routes



Adapted from: Exh. NG-2, at fig. 5-10; RR-EFSB-5

After putting the New Cable into service, NEP would remove the existing 3.6-mile-long direct-buried oil-filled N-192 Cable (Exhs. NG-1, at 3; NG-2, at 3; Tr. 1, at 157). Most of the Existing Cable runs along the Massachusetts Bay Transportation Authority's ("MBTA") active Eastern Route Main Line and Gloucester Branch; it also includes a one-half mile crossing under the Danvers River (Exh. NG-2, at 3; Tr. 1, at 57).

The Company provided public notice of a 4.17-mile alternative route, which is generally located in streets to the north of the Primary Route ("Noticed Alternative Route"), which is also shown in Figure 1, above (Exh. EFSB-G-9). For the Noticed Alternative Route, all substation connections and alterations, the new Waite Street Switching Station, all underground routing in Salem, the Danvers River crossing, and some of the cable route in downtown Beverly and also from Lakeshore Ave/Cross Lane to East Beverly #51 Substation, would be the same as for the Primary Route (Exh. EFSB-G-14).

According to the Company, the Project is needed to maintain a reliable supply of electricity to customers in Beverly, Wenham, Hamilton, Essex, Manchester-by-the-Sea,

Gloucester, and Rockport ("Beverly/Cape Ann Area") (Exhs. NG-2, at 3; EFSB-N-1). The Company's estimate of the cost of the Project, with an approximate accuracy of -25%/+50% (including removal of the Existing Cable) is $81.2 million (Exh. NG-2, at 7).[2,3]

Since the hearing and filing of briefs in July 2020, the Existing Cable has experienced multiple dielectric fluid leaks, dig-ins at five locations along the MBTA right-of-way ("ROW"), and, on April 6, 2021, an electrical fault that has resulted in the forced outage of the Existing Cable (Exh. EFSB-Z-2(S1)). The Existing Cable has been out of service since April 6 and will remain so until damage caused by the fault and dig-ins has been repaired, likely toward the end of 2021 (Exh. EFSB-Z-2(S1)). This immediate and urgent threat to reliability adds significantly to the need for the Project as discussed in more detail in Section III, below.

B. Procedural History

On June 27, 2019, NEP filed one petition with the Siting Board and two petitions with the Massachusetts Department of Public Utilities ("Department"). In these petitions, the Company seeks: (1) Siting Board approval to construct the Project pursuant to G.L. c. 164, § 69J ("Siting Petition"); (2) Department approval to construct and use the Project pursuant to G.L. c. 164, § 72 ("Section 72 Petition"); and (3) a Department grant of individual and comprehensive exemptions from the zoning ordinances of the cities of Salem and Beverly for the Project pursuant to G.L. c. 40A, § 3 ("Zoning Petition") (together, the "Petitions").

The Siting Petition was docketed as EFSB 19-04, the Section 72 Petition as D.P.U. 19-77, and the Zoning Petition as D.P.U. 19-78. Pursuant to the Company's motion, on October 28, 2019, the Chairman of the Department issued a Consolidation Order referring the Section 72 and the Zoning Petitions for review by the Siting Board pursuant to

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2 NEP indicated that this cost estimate does not include an additional approximate $17 million it anticipates spending for distribution upgrades, including a new 13.2/4.16 kV yard and 23 kV feeder work at Beverly #12 Substation, which it stated will be pursued separately (Exh. EFSB-C-5). These distribution system upgrades are not part of the Project (id.).

3 In a subsequent analysis, the Company described and used a probability-based cost estimating method for the Project (but only for the Primary Route); see Section VI.E.

G.L. c. 164, § 69H(2). The consolidated proceeding was docketed as EFSB 19-04/D.P.U. 19-77/19-78. The Siting Board conducted a single adjudicatory proceeding and developed a single evidentiary record for the Petitions.

Pursuant to the Presiding Officer's instructions, the Company: (1) published the Notice of Public Comment Hearing/Notice of Adjudication ("Public Comment Hearing Notice") for the Project for two consecutive weeks in both the Salem News and the (Beverly) Herald Citizen; (2) posted copies of the Public Comment Hearing Notice and the Please Read summary document with the city clerks and public libraries in both Salem and Beverly; and (3) placed the documents on the Company's website. In addition, the Presiding Officer directed the Company to place copies of the Petitions, including attachments, at the Salem and Beverly City Clerks' offices and the public libraries. With respect to the locations described below, the Presiding Officer directed the Company to mail a copy of the Public Comment Hearing Notice and the Please Read document to all owners of land that either abuts the locations, all owners of land that lies directly opposite the locations, and all abutters to said abutters within 300 feet: (1) the route of the Existing Cable; (2) the proposed Primary Route; (3) the proposed Noticed Alternative Route; (4) the noticed variations of the Primary and Noticed Alternative Routes; and (5) the existing substations stations. The Presiding Officer also directed the Company to mail a copy of the Public Comment Hearing Notice and the Please Read document to all owners of land that abut the Waite Street Switching Station, all owners of land that lies directly opposite the Waite Street Switching Station, and all abutters to said abutters within one-quarter mile of the Waite Street Switching Station. Finally, the Presiding Officer directed the Company to send the Public Comment Hearing Notice to the Planning Boards of the cities of Salem and Beverly and to the Planning Boards of every abutting city or town.[4]

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[4] The Project does not trigger either the enhanced public participation or enhanced analysis of impacts and mitigation provisions of the Office of Energy and Environmental Affairs Commonwealth's 2017 Environmental Justice Policy (revised June 24, 2021) (RR-EFSB-10). Furthermore, the Siting Board staff's analysis of relevant language demographic data indicated that no interpretation or translation services were required, consistent with the Commonwealth's Language Access Policy. See Language Access Policy and Implementation Guidelines, Office of Access and Opportunity, A&F Administrative Bulletin #16, issued March 2015. See Section VII.2.c below.

Siting Board staff conducted a public comment hearing on December 11, 2019, in Beverly. The Company submitted a return of service attesting that it had given notice of the public comment hearing as required (Exh. NG-5). Public hearing commenters raised a variety of concerns including the impacts of construction on a specific vernal pool, the effect of blasting on bedrock and underground streams, whether the New Cable would contain dielectric fluid (it would not), the procedure for property owners to obtain redress if the construction damages their property, work hours, traffic impacts, driveway access, whether the New Cable could cause the natural gas from adjacent underground piping to explode, and whether the New Cable could be installed in the same ROW as the Existing Cable (Tr. December 11, 2019, at 20-37).

The Presiding Officer granted intervenor status to Dr. James Rome and Charles Rolke, both of whom own houses abutting the Primary Route. No one filed a petition requesting limited participant status. The Siting Board issued three sets of information requests to the Company, and Dr. Rome issued one set of questions to the Company. Dr. Rome submitted written direct testimony, and the Siting Board subsequently issued a set of information requests to him. The Company executed memoranda of agreement with the Cities of Beverly (March 26, 2020, "Beverly MOA") and Salem (April 7, 2020, "Salem MOA") (Exhs. EFSB-CM-15(S1)(1); EFSB-CM-15(S2)(1)).

The Siting Board conducted remote evidentiary hearings via videoconference on June 2, 4, and 9, 2020. At the hearings, the Company presented ten witnesses on behalf of NEP for cross-examination: Aidan Murphy, National Grid's lead project manager; Sinan Ashkouri, National Grid's lead engineer for underground transmission; David LaPlante, National Grid's distribution planner; Matthew Spofford, National Grid's senior engineer for substation engineering; Joshua Holden, National Grid's lead construction planner; David Terzian, National Grid's principal gas engineer; Victor Antoniello, principal engineer at Electrical Consulting Engineers, P.C.; Lee Curtis, vice-president and ecological services lead at BSC Group; Joshua Lee Smith, outside zoning counsel from Bowditch and Dewey; and William H. Bailey, consultant on magnetic fields exposure from Exponent. Dr. Rome cross-examined several Company witnesses, and he provided pre-filed testimony. Dr. Rome was available for cross-examination, but no questions were asked of him.

The Presiding Officer admitted 334 exhibits into evidence, including the petitions, responses to information requests and record requests, and hearing exhibits. The Company filed its brief on July 2, 2020, and Dr. Rome filed his brief on July 7, 2020. The Company and Dr. Rome both filed reply briefs on July 16, 2020.

Siting Board staff prepared a Tentative Decision and distributed it to the Siting Board members and all parties for review and comment on September 20, 2021. The Company published a notice of the Siting Board public meeting regarding this Tentative Decision in the Salem News and the Herald Citizen. The Company also mailed a copy of the notice to: (1) all persons on the Service List; (2) all owners of property and all U.S. Mail addresses within 300 feet of the primary route and the noticed alternative route; (3) all owners of property and U.S. Mail addresses within one-quarter mile of 10 Waite Street; (4) the owners of all property abutting the route for the Existing Cable. The Company also sent a copy of the Notice to the City Clerks for Salem and Beverly; the Beverly Planning and Development Department; the Salem Planning and Community Development Department; the president of the Salem City Council; and the president of Beverly City Council. Furthermore, a copy of the Notice was placed on the Company's website on, or shortly after, September 20, 2021. In addition, the Presiding Officer sent by email the Notice to a variety of community-based organizations that serve or operate in the vicinity of the Project. The parties were given until September 27, 2021, to file written comments. The public was given until October 1, 2021, to file written comments.

The Siting Board received timely written comments from NEP; and Beverly residents Robert Carbone, Ariana Moran, Nathan and Meridien Youndt, and Blyth Hazen. The Board conducted a remote public meeting to consider the Tentative Decision on October 6, 2021, at which the parties and public presented oral arguments. After deliberation, the Board directed staff to prepare a Final Decision approving the Petitions, subject to certain conditions set forth below.

II. JURISDICTION

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, and are consistent with current health, environmental protection, and resource use and development policies of the Commonwealth. See Town of Sudbury v. EFSB, 487 Mass. 737, 746-747 (2021). 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 Company's proposed 115 kV underground transmission line would be approximately 3.73 miles long and run almost entirely along a new transmission corridor. Therefore, the proposed 115 kV transmission line is a "facility" with respect to Section 69J and the Project is subject to Siting Board review under Section 69J.

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

proposed facilities are consistent with the current health, environmental protection, and resource use and development policies of the Commonwealth (see Section VII, below).[5]

III. NEED FOR THE PROPOSED PROJECT

A. Standard of Review

The Siting Board reviews the need for proposed transmission facilities to meet reliability, economic efficiency, or environmental objectives. G.L. c. 164, §§ 69H, 69J. When demonstrating the need for a proposed transmission facility based on reliability considerations, a petitioner applies its established planning criteria for construction, operation, and maintenance of its transmission and distribution system. Compliance with the applicable planning criteria can demonstrate a "reliable" system. NSTAR Electric Company d/b/a Eversource Energy, EFSB 19-03/D.P.U. 19-15, at 7 (2021) ("Andrew-Dewar"); NSTAR Electric Company d/b/a Eversource Energy, EFSB 17-02/D.P.U. 17-82/17-83, at 15 (2019) ("Sudbury-Hudson"); NSTAR Electric Company, EFSB 14-04/D.P.U. 14-153/14-154, at 8, 9 (2017) ("East Eagle").

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. Andrew-Dewar at 7; Sudbury-Hudson at 15; East Eagle at 9. See also Town of Sudbury v. EFSB, 487 Mass. at 748-749.

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[5] As noted above, we include the removal of the Existing Cable is within the scope of the Project and therefore within the scope of this Decision. The Siting Board and the Department have considered the impacts of removing existing cables and structures undertaken in connection with the construction of a facility. See, e.g., New England Power d/b/a National Grid, EFSB 13-21/D.P.U. 13-151/13-152, at 33, 42-44, 64 (2014) ("Salem Cables"); NSTAR Electric Company, D.P.U. 13-126/127, at 2 (2014) ("Electric Avenue"); NSTAR Electric Company, EFSB 10-1/D.P.U. 10-107/10-108, at 1-2, 4 (2012) ("Hampden Reliability Project").

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. Andrew-Dewar at 7-8; Sudbury-Hudson at 15; East Eagle at 9.

B. Description of the Company's Demonstration of Need

As noted above, the Company has asserted that the Project is needed immediately to maintain a reliable supply of electricity to customers in the Beverly/Cape Ann Area (Exh. NG-2, at 3). The Project would replace the Existing Cable, which is a 1970s era 3.6-mile pressurized self-contained fluid-filled ("SCFF") direct-buried cable extending from the Company's North River #30 Terminal in Salem to East Beverly #51 Substation, that has a history of leaking fluid (Exhs. NG-2, at 3, 11, 12; EFSB-N-1; Tr. 1, at 48). When the Existing Cable leaks, it must be taken out of service for repairs, leaving customers in the Beverly/Cape Ann Area entirely reliant on the overhead M-191 Line and limited 23 kV ties for electricity (Exh. EFSB-N-1). The New Cable is insulated with extruded cross-linked polyethylene ("XLPE") plastic dielectric material, would contain no fluid and, therefore, will not leak (id.; Exhs. NG-2, at 11; EFSB-PA-16; Tr. 1, at 69). NEP stated that the Existing Cable needs to be replaced to address reliability and environmental concerns resulting from its age, obsolescent technology, and history of dielectric fluid leaks, and cost to repair (Exh. EFSB-N-1; Company Brief at 32-33).

1. Description of Existing System

NEP's transmission system serves nearly 50,000 electric customers in the Beverly/Cape Ann Area (Exh. NG-2, at 11). Approximately 16,500 of these customers are in Beverly, with an additional approximately 33,000 customers in the Cape Ann communities of Essex, Gloucester, Hamilton, Manchester-by-the-Sea, Rockport, and Wenham (id.). NEP projected that 2019 summer peak load for the Beverly/Cape Ann Area would be approximately 180 megavolt-amperes ("MVA") (id.).[6] Approximately 34 MVA of the Beverly/Cape Ann Area load is served from the Beverly #12 Substation, and 124 MVA from the East Beverly #51 Substation; the remaining 22 MVA is served via the 23 kV sub-transmission system from Salem Harbor #45 Substation (id.).

Two 115 kV lines are the only transmission-level connections serving the Beverly/Cape Ann area – the M-191 overhead transmission line and the Existing (N-192) Cable (Exh. NG-2, at 11). The M-191 Line supplies the Beverly #12 and East Beverly #51 Substations, and the Existing Cable supplies the East Beverly #51 Substation (id. at 26).[7] NEP explained that the two 115 kV supplies provide redundancy to each other, ensuring that when one line is out of service

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[6] MVA is a measure that includes megawatts ("MWs") and volt-amperes, reactive ("VARs"). When VARs are in an appropriate range, an MVA measurement is just slightly higher than an MW measurement. NSTAR Electric Company, EFSB 10-2/D.P.U. 10-131/10-132, at 7, n. 6 (2012) ("Lower SEMA").

[7] The Beverly #12 site contains both a 115/13.2 kV and a 23/4.16 kV substation (Exh. NG-2, at 12). The 115/13.2 kV station is a single transformer station supplied exclusively by the M-191 Line; outage of the M-191 Line leads to the outage of the entire 115/13.2 kV station (id. at 11). The 23/4.16 kV station is supplied by four 23 kV circuits from Salem Harbor #45 (id.). The Existing Cable passes through, but is not interconnected with, the Beverly #12 Substation (id.).

The East Beverly #51 Substation has two 115 kV transmission supplies: the M-191 Line and the Existing (N-192) Cable (Exh. NG-2, at 11). The substation is divided between two sub-transmission system voltages, with two 115/34.5 kV transformers and two 115/23 kV transformers that provide automatic redundancy to each supply system (id.). This substation is the sole source of supply for NEP's distribution affiliate, Massachusetts Electric Company's ("MECo") five distribution substations on Cape Ann (id.). In addition, it provides supply to the North Beverly distribution substation and serves Beverly area load (id.).

for repair or maintenance, electric customers continue to receive power from the other cable (id.).

2. Problems with the Existing System

According to the Company, the process of locating and remediating dielectric fluid releases and repairing direct-buried SCFF cables is complex and time consuming (Exh. NG-2, at 17). Because direct-buried cables are not easily accessible for visual inspection, specialized techniques are needed to trace the source of the fluid release (id.). Each instance of excavation to assess the cable may inconvenience nearby residents and businesses (id.). The Company added that actual repairs of the existing SCFF cable are becoming more difficult and costly because the technology is outdated, replacement parts are increasingly difficult to obtain, and a decline in the number and availability of experienced craftsmen proficient in the repair of SCFF cable systems (id. at 3, 17). NEP also noted that, in addition to environmental impacts that are a direct result of dielectric fluid leaks, the process of locating and remediating dielectric fluid releases and repairing SCFF cables is disruptive, often resulting in prolonged traffic and noise impacts (id. at 17).

The Company attributed most of the leaks to age and to thermomechanical bending caused by changing cable temperatures (Exhs. NG-2, at 3, 18; EFSB-N-4).[8] The Company stated that, although the Existing Cable has been relatively stable since the 2012/2013 period, it remains at increased risk for additional lengthy outages; and the Company expects an increasing frequency of leaks as the cable ages (Exhs. NG-2, at 22; EFSB-N-5; Tr. 1, at 59). The Company stated further that, in recent years, the forced outages for repairs of the Existing Cable have been extensive – 507 hours (21.5 days) in 2012 and 360 hours (15 days) in 2013 (Exh. EFSB-N-1). NEP asserted that these lengthy forced outages represent a significant diminution in reliability for MECo customers in the Beverly/Cape Ann Area and considers the existing failure rate unacceptable (Exh. EFSB-N-1; Tr. 1, at 60).

[8] NEP reported that five of the fluid leaks stemmed from third-party dig-ins (Exh. NG-2, at 18).

As noted above, there have recently been multiple dielectric fluid leaks and dig-ins on the Existing Cable and, on April 6, 2021, an electrical fault resulted in a forced outage of the cable ("April 6 Failure") (Exh. EFSB-Z-2(S1)). The Existing Cable has been out of service since the April 6 Failure, and will remain so until damage caused by the fault and dig-ins has been repaired, likely toward the end of 2021 (id.). Until that time, the entire Cape Ann area is being served via the overhead M-191 transmission line (and via the C-155 line to which the M-191 is connected) (id.; Exhs. EFSB-G-12). Loss of either of these overhead lines would result in loss of service to approximately 43,000 electric customers (Exh. EFSB-Z-2(S1)). Approximately 6,000 of these customers could be picked up using distribution switching; the remainder would remain without electricity until overhead line repairs could be completed (id.). The Company is planning a number of short-term measures to bolster reliability in the area.[9]

A secondary purpose of the Project is to remove the Existing Cable from its existing location which largely runs along the active MBTA ROW, and to replace it with the New Cable which would be routed through a manhole and duct bank system within city streets (Exh. NG-2, at 3; Tr. 1, at 51). The Company views this change as both improving access to the line and improving worker safety (Exh. NG-2, at 3; Tr. 1, at 51). Presently, the Company must perform maintenance work along the MBTA commuter rail line (Exh. NG-2, at 3; Tr. 1, at 51). Coordinating repairs with rail service generally means, in practice, limiting repairs to a four-hour window (from 1:00 a.m. to 5:00 a.m.) when commuter trains are not in service (Exh. EFSB-PA-1).

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[9] Among its short-term measures, NEP has decided to replace a section of damaged cable with XLPE cable rather than with SCFF cable, primarily due to the difficulty of obtaining replacement parts and the limited availability of experienced craftsmen proficient in the repair of SCFF cable systems (Exh. EFSB-Z-2(1)). The repair work will include the installation of XLPE cable termination equipment at the East Beverly Substation, approximately 500 feet of XLPE cable between the new termination and the fault location, a transition splice to connect the new XLPE cable to the existing SCFF cable, and a fluid supply line running from the East Beverly Substation to the transition splice to supply fluid to the remaining SCFF cable (id.).

3. Additional Project Benefits for the Distribution System

In addition to replacing the leak-prone Existing Cable in the active MBTA ROW, the Company explained that the Project would add a second 115 kV supply to the Beverly #12 Substation (Exh. NG-2, at 3). Unlike the East Beverly #51 Substation, Beverly #12 Substation is supplied by a single 115 kV feeder (line M-191) and has a single 115/13.2 kV transformer (id. at 3, 12).[10] If the line M-191 has an outage, MECo cannot serve all its customers supplied by the Beverly #12 Substation until the line is returned to service (id. at 3; EFSB-N-1). An additional risk is that an outage of the sole 115/13.2 kV transformer at Beverly #12 Substation during peak load would result in 24.1 MVA of customer load going unserved, a portion of which would remain unserved until a mobile substation and/or diesel generators are rolled into the area (Exh. EFSB-N-8). Assuming that full restoration would require 24 hours, NEP stated that the potential loss of load exceeds MECo distribution planning criteria, which require that an outage on substation or transmission company-owned equipment should result in no more than 240 megawatt-hours ("MWh") of load out of service, calculated by multiplying the load lost (MW) by the duration of the outage (in hours) (Exh. NG-2, at 3, 22, 22 n.3).[11] As viewed by NEP, the asset condition-driven need to replace the Existing Cable also provides an opportunity for a solution to the distribution planning criteria violation (Exh. EFSB-N-9).[12] Finally, by increasing the deliverability of power through the Beverly #12 Substation, MECo would have more flexibility to redistribute load between the two existing substations, which would enhance power system reliability (Exh. NG-2, at 11).

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10 The Beverly #12 Substation also has 23/4.16 kV equipment fed with four 23 kV feeders from Salem Harbor #45 (Exh. NG-2, at 12). NEP indicated that the 23 kV circuits from Salem Harbor to Beverly are also failing (id. at 22).

11 The Company stated that MECo distribution planning engineers had been aware of this exceedance of the 240 MWh MECo standard and had been working toward potential solutions for several years prior to its formal documentation in 2018 (Exh. EFSB-N-9).

12 While the Siting Board recognizes additional distribution system benefits from the Project, the Siting Board's jurisdiction focuses on transmission systems. G.L. c. 164, § 69H.

4. Load Projections

NEP provided a load projection for summer peak load for Beverly and Cape Ann, as shown in Table 1, below; NEP does not anticipate any net load growth in the Beverly/Cape Ann over the ten-year forecast horizon (Exhs. EFSB-N-11; EFSB-N-13; EFSB-N-14). The Company stated that the reliability and environmental issues relating to the Existing Cable's age, obsolete technology, and fluid leaks are unrelated to any projected changes in load in the Beverly/Cape Ann Area (Exh. EFSB-N-14). In short, the Company stated that the Project is not needed for load growth; rather, the need to replace the Existing Cable based on its deteriorating condition and risk of related outages (id.).

Table 1. Projected Beverly & Cape Ann 115 kV Load

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
MVA	170.2	168.5	170.0	169.9	170.0	169.9	169.9	169.9	169.9	169.9	169.3

Source: Exh. EFSB-N-1

NEP represented that the Project is needed immediately to reduce repair and remediation costs, to eliminate environmental impacts from releases, and to improve the reliability of electric service in the Beverly/Cape Ann Area (Exh. NG-2, at 23). NEP argues that the Project satisfies the Siting Board's standards and relevant precedent for jurisdictional facilities (Company Brief at 27).[13]

C. Analysis and Findings on Need

The Existing Cable serving East Beverly #51 Substation requires immediate replacement due to the continuing risk of soil and groundwater contamination from fluid leaks, the increasing difficulty and safety hazard of implementing repairs to the cable, and reduced electric system reliability. The record also demonstrates that the Beverly #12 Substation requires a second high-voltage source and additional transformer capacity to reliably maintain local service in the event of a single contingency event and, secondarily, that a new 115 kV line connecting the Beverly

[13] No party in the proceeding contested Project need.

#12 and East Beverly #52 Substations would provide MECo with a more robust and flexible transmission configuration in serving its customers.

The Siting Board's review of the Company load forecast has confirmed that it provides sufficient information to permit an understanding of its forecasting method and that the Company's forecast is reviewable, appropriate, and reliable for use in this proceeding. The forecast clearly indicates that peak loads in the Beverly/Cape Ann Area will remain relatively flat for the next 10 years. Nevertheless, the record also shows that need for the Project is based on asset condition and the need for improved reliability – not growth in customer loads. Therefore, the load forecast has only limited importance in this proceeding, but it does establish that loads will likely not decrease sufficiently to negate concerns about the condition of the Existing Line (Line M-192) or the lack of adequate feeder and transformer capacity at the Beverly #12 Substation, that collectively pose significant risks to reliably serving customers in this area.

Therefore, the Siting Board finds that additional energy resources are needed to maintain a reliable supply of electricity in the Beverly/Cape Ann Area.

IV. ALTERNATIVE APPROACHES TO MEETING THE IDENTIFIED NEED

A. Standard of Review

G.L. c. 164, § 69J requires a project proponent to present alternatives to the proposed facility, which may include: (1) other methods of transmitting or storing energy; (2) other sources of electrical power; or (3) a reduction of requirements through load management.[14] 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. Andrew-Dewar at 24; Sudbury-Hudson

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

at 27; NSTAR Electric Company d/b/a Eversource Energy, EFSB 14-2/D.P.U. 14-73/14-74, at 17 (2017) ("Walpole-Holbrook").

B. Company Analysis of Alternative Approaches to Meet Need

In its Petition, the Company discussed broad categories of potential alternative approaches to meeting the need (Exh. NG-2, at 25-37). These categories included non-wires alternatives; two underground cable alternatives (including the Project); an overhead wire alternative; building transmission to the area from King Street Substation in Groveland ("King Street Alternative"); and various overhead and underground alternatives re-using the MBTA ROW (id.).[15] Each of these alternative approaches is discussed further below. The Company also provided information on its selection of underground cable technology, discussed in Section IV.B.3, below.

1. Non-Wires Alternatives

NEP stated that its sub-transmission system ties currently have the capacity to serve approximately 30 percent of the total Beverly/Cape Ann Area load (Exh. NG-2, at 26). To substitute for the redundancy currently provided by the Existing Cable at the East Beverly #52 Substation, a non-wires alternative ("NWA") would need to be sized to serve the remaining 70 percent of load (approximately 125 MW of load) during planned and unplanned outages of the M-191 Line (id.). According to the Company, to replace the function of the Existing Cable, the NWA would also need to be instantaneously available to respond to an unplanned outage and would need to continue to deliver power until the M-191 Line could be placed back into service (id.; Exh. EFSB-PA-17; Tr. 1, at 64).

[15] NEP also presented a no-build alternative. However, NEP stated that, because the Existing Cable needs to be replaced to maintain transmission system reliability, the Company determined that the no-build alternative would not meet the identified resource need and eliminated it from further consideration (Exh. NG-2, at 25).

NEP initially indicated that this level of reliability could be provided by a battery energy storage system sized to serve this 125 MW load for at least 24 hours (Exh. NG-2, at 26).[16] The Company described this amount of storage as adequate for the typical duration of an outage (Exh. EFSB-PA-17). However, it noted that while restoration of contingencies involving overhead transmission lines, air insulated bus sections, and capacitor banks typically takes less than 24 hours, restoration of underground cables, gas insulated substations, or large power transformers often takes more than 24 hours (Exh. EFSB-PA-17). Restoration of damage caused by major storm events can also take more than one day (id.). Compared to a target of 125 MW load for 24 hours, NEP has recently installed a much smaller battery energy storage system on Nantucket, capable of providing 6 MW for eight hours at a cost of approximately $33 million (Exh. NG-2, at 26). The Company stated that even assuming significant efficiencies of scale, the cost of a battery storage system sized to replace the Existing Cable would far exceed the cost of the Project (id.).

NEP stated that other resources traditionally considered for NWAs, such as energy efficiency, demand response, and distributed generation would not address the underlying asset condition, described above in Section III (Exh. NG-2, at 26). Since the only potentially effective NWA would be far more costly than the Project, NEP did not evaluate it further as a Project alternative (id.).

2. Transmission Alternatives

NEP considered several transmission alternatives with distinct approaches to meeting the reliability needs of the Beverly/Cape Ann Area, as described above.[17]

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16 In response to follow-up questioning, NEP indicated that a battery energy storage system would not actually need to provide full power for 24 hours because loads drop at night (Exh. EFSB-PA-17). Based on the peak electrical load in the Beverly/Cape Ann Area, from a single day in 2019, the Company calculated that the appropriate size for battery storage unit serving as a non-wires alternative for the Existing Cable would need to have approximately 2,446 MWh, not 3,000 MWh for a 24-hour period (id.).

17 As an alternative to underground construction in streets, NEP considered the possibility of replacing the Existing Cable with a new 115 kV overhead transmission line through

a. The Project

As noted above, the Project involves the construction of a new 115 kV underground cable located within a duct bank and manhole system connecting the proposed Waite Street Switching Station with the Beverly #12 and East Beverly #51 Substations (Exh. NG-2, at 26). The Company anticipates that with in-road construction, there would be no direct impacts to natural resources such as vegetated wetlands, rare species habitats, aquifers, or marine resources, so environmental impacts would largely be confined to temporary construction impacts related to traffic disruption, dust, and noise (id. at 26-27).

Beyond meeting the need to replace the aging Existing Cable, the Project would provide a second 115 kV supply to the Beverly #12 Substation, allowing MECo to address an existing violation of its 240 MWh distribution planning criterion and the existing potential for thermal overloads on equipment at the East Beverly #51 Substation (Exh. NG-2, at 27).[18] NEP stated that the New Cable would also allow MECo to address asset condition concerns at the 23/4.16 kV yard at Beverly #12 Substation and on the 23 kV circuits serving the area from Salem Harbor #45 (id.). Thus, the Company contends that the New Cable would improve the reliability of the transmission system and the distribution system serving the Beverly/Cape Ann Area (id.). The Company asserted that reliability concerns associated with an underground cable installation are minimal because accessing the cable to facilitate inspections and repairs is straightforward using the manhole entrances along the route (id.; Exh. EFSB-PA-18). At the time the Company

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Beverly (the "Overhead Alternative") (Exh. NG-2, at 29). NEP stated that the property acquisition and demolition that would be required to create a new 60-to-80-foot-wide overhead transmission line ROW through Beverly would affect a very large number of residents and businesses and cause significant social, economic, and visual impacts (id.). Therefore, NEP decided that the Overhead Alternative would be infeasible and eliminated it from further consideration (id.).

[18] NEP stated that the Project would resolve all identified reliability issues on its transmission system without completing a new 13.2/4.16 kV yard at Beverly #12 Substation; however, the Project would additionally facilitate the cost-effective resolution of reliability issues on the MECo distribution system (Exh. EFSB-C-7). The Project cost estimate does not include the additional distribution system work (id.).

compared project approaches, the estimated cost of the New Cable and associated transmission upgrades, including the cost of a new 115/13.2 kV transformer at Beverly #12 Substation, was approximately $75.0 million (Exh. NG-2, at 27; see Section VI.E for updated cost estimates).

b. Waite Street – East Beverly Alternative

A project alternative of only connecting Waite Street to East Beverly involves the construction of a new 115 kV underground cable, within a duct bank and manhole system, connecting the proposed Waite Street (#594) Switching Station with the East Beverly #51 Substation, without connecting to the Beverly #12 Substation (Exh. NG-2, at 27). The Waite Street – East Beverly Alternative would be approximately 3.5 miles long and, like the New Cable, it would be located primarily in public roads within the Cities of Beverly and Salem (id.). NEP stated that potential environmental impacts would be very similar to those of the New Cable (id.). The Company estimated that the Waite Street – East Beverly Alternative would reduce transmission infrastructure costs by approximately $9 million (id.). Approximately $5 million of this differential is associated with reduced construction costs for a shorter underground cable; the remaining $4 million reflects the elimination of a tap for the N-192 Cable at Beverly #12 and the new Beverly #12 transformer (id.).

However, NEP stated that this $4 million savings would be more than offset by the increased cost of addressing distribution system needs, absent a new, second 115 kV supply at the Beverly #12 Substation (Exh. NG-2, at 27). When additional distribution costs are considered, the total cost of meeting Beverly/Cape Ann Area reliability and asset condition needs, inclusive of the New Cable, is approximately $99 million; in comparison, the Company estimated the cost of transmission plus distribution work, with the Waite Street – East Beverly Alternative, at $105 million (id.). In addition to being more expensive overall, the incremental distribution work required in conjunction with the Waite Street – East Beverly Alternative would result in greater impacts to the environment and the public due to the need to install a new 2.5-mile manhole and duct bank system for distribution circuits between Salem Harbor #45 and Beverly #12 Substations (id. at 29).

NEP stated that the Waite Street – East Beverly Alternative would not provide the additional flexibility associated with a second transformer at the Beverly #12 Substation, which would allow MECo to add distribution feeders at the Beverly #12 Substation to serve load in the Beverly area (Exh. EFSB-PA-19). The additional 115 kV transformer would also address present and future distribution facility overloads at the East Beverly #51 Substation by enabling load transfer from East Beverly #51 Substation to Beverly #12 Substation (id.). Thus, the installation of a second 115 kV transformer at the Beverly #12 Substation (part of the Project but not the Waite Street – East Beverly Alternative) would provide future flexibility in balancing the load served from the Beverly #12 and East Beverly #51 Substations (Exh. NG-2, at 29). The second transformer would also make it easier for NEP to maintain its area transmission system (e.g., enable it to take the M-191 transmission line out of service for maintenance) without disrupting service to customers in the Beverly/Cape Ann Area (id.; Exh. EFSB-PA-19). Overall, NEP concluded that the incremental cost of providing a second 115 kV supply at the Beverly #12 Substation would be offset by the additional reliability provided by the second supply and the cost savings associated with a reduced scope of distribution system work in the Beverly #12 Substation area (Exhs. NG-2, at 29; EFSB-PA-19).

c. King Street Alternative

NEP considered installing a combination of overhead and underground transmission circuits from King Street Substation in Groveland to the East Beverly #51 Substation (Exh. NG-2, at 29-30). The Company stated that the King Street Alternative would meet the identified transmission reliability need (Exh. EFSB-PA-8). The King Street Alternative would require acquisition of new ROW and/or expanding existing 23 kV corridors traversing the municipalities of Groveland, Georgetown, Boxford, Topsfield, Wenham, and Beverly for approximately 14 miles (Exh. NG-2, at 30). This overhead line would then transition underground for approximately four miles in a duct bank and manhole system and would terminate at the East Beverly #51 Substation (id.). NEP estimated the cost for the King Street

Alternative of at least $110 million (id.).[19] The King Street Alternative, like the Waite Street – East Beverly Alternative, would not provide a new 115 kV supply to the Beverly #12 Substation and consequently, MECo would need to implement alternative distribution upgrades estimated to cost an additional $39 million, resulting in a total cost of at least $149 million to meet Beverly/Cape Ann Area reliability needs (id. at 31).

Creation of new overhead ROWs and expansion of existing ROWs would involve substantial tree clearing, potential permanent wetlands impacts, temporary impacts during construction, buffer zone impacts, riverfront area impacts, floodplain impacts, and potentially impacts to flora and fauna (Exh. EFSB-PA-8). The Company concluded that the King Street Alternative would result in significant additional impacts to both the natural and built environment, as compared to the Project (id.).

d. MBTA Right-of-Way Alternatives

NEP evaluated the feasibility of installing the new 115 kV transmission circuit either underground or overhead within the existing MBTA corridor (Exh. NG-2, at 31).[20] The existing overhead M-191 Line and underground Existing Cable are installed along portions of the MBTA ROW (id.). The MBTA's Eastern Route Main Line track ("Main Line") extends from North Station in Boston to Beverly Depot Station, and onward to Newburyport (id.). The Gloucester Branch diverges at Beverly Depot Station and travels north and east to the Montserrat, Prides Crossing, and Beverly Farms stations in Beverly, and onward eventually to Rockport (id.).

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19 NEP stated that an ISO-NE system impact study would be required for this solution (Exh. EFSB-PA-8). The Company's $110 million cost estimate does not include the costs of ROW expansion, land acquisition, permitting and any additional transmission system upgrades required as a result of a new electrical connection between East Beverly #51 and King Street Substations (Exh. NG-2, at 30). While the Company was unable to quantify all of these costs, it did provide an estimate that land acquisition costs would be on the order of an additional $11.8 million (Exh. EFSB-PA-8).

20 NEP notes that it evaluated the MBTA alternatives at the request of the City of Beverly and that it prepared a detailed evaluation entitled "Constructability Review to Install a New N-192 115 kV Transmission Line on the MBTA ROW in Beverly, MA," which was provided as an appendix to the Petition (Exh. NG-2, at 31).

The Company stated that the Existing Cable needs to remain in service until construction of its replacement is completed (Exh. NG-2, at 31).[21] The MBTA ROW currently contains two sets of tracks, the overhead M-191 Line, two direct buried 23kV circuits, the Existing Cable underground, an overhead pole line supporting railroad communication lines, track switches and railroad signal equipment; furthermore, a vitrified clay drain pipe runs parallel to the tracks along a portion of the ROW and there are several culverts crossing under the tracks (id.).

Evaluating the possibility of installing an underground cable along the MBTA ROW, the Company stated that the section of the Main Line between Beverly #12 Substation and the divergence of the Gloucester Branch contains railroad bridges at Pleasant Street and Federal Street, the Beverly Depot MBTA station, and multiple side tracks and switches (Exh. NG-2, at 33). Due to these features, NEP stated that there is insufficient space within the Main Line MBTA ROW to install the new transmission cables (id.). The Gloucester Branch MBTA ROW from the Main Line to the East Beverly #51 Substation is fairly narrow, as characterized by the Company, and it crosses three streets at grade, passes through the Montserrat Train Station and abuts many residential backyards (id.). In this area, compliance with the MBTA's live load influence zone rules would place the outside edge of a hypothetical new cable trench at least 22 feet from the centerline of the nearest track, which puts a new cable either outside the ROW on the west side, or in the same area occupied by two 23 kV cables and the overhead M-191 Line on the east side of the tracks (id. at 34). The Company concluded that the Underground MBTA Alternative would be infeasible without the acquisition of extensive additional property rights along the eastern side of the MBTA ROW (id.).

For a second (in addition to the M-191 Line) overhead transmission line within the

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[21] Taking the Existing Cable out of service for an extended period to support construction would leave Beverly/Cape Ann Area customers reliant on the M-191 Line for electric service (Exh. NG-2, at 25). With the Existing Cable unavailable, the contingency of an outage of the M-191 Line would result in immediate loss of service to 125 MW of load, or approximately 35,000 customers, until either the M-191 Line or the Existing Cable could be returned to service (id.). NEP views this as an unacceptable reliability risk for its Beverly/Cape Ann Area customers (id.). Therefore, a replacement for the Existing Cable would need to be constructed and ready for service prior to taking the Existing Cable out of service (id.).

existing ROW, NEP evaluated the feasibility of installing the new line either as a second circuit on new common structures with the M-191 Line ("Double-Circuit Alternative"), or as a separate line on a new set of single circuit structures ("Single-Circuit Alternative") (Exh. NG-2, at 34). The Double-Circuit Alternative would require converting the existing M-191 Line, which runs overhead within the MBTA ROW, to double circuit towers carrying both the M-191 Line and the new N-192 Line (id. at 36). Almost all the existing foundations and structures would need to be replaced, requiring lengthy outages of the M-191 Line during construction, degrading area reliability during construction (id.). In addition, installing the Double-Circuit Alternative would result in 3.3 miles of double-circuit towers, creating the potential for a single contingency outage of both 115 kV lines on the same towers and therefore reduced reliability (id.). NEP therefore eliminated the Double-Circuit Alternative from further consideration (id.).

The Single-Circuit Alternative would require the installation of a new 115 kV overhead line on new structures with drilled shaft foundations within the MBTA ROW (Exh. NG-2, at 34). The Company stated that there is insufficient space on the east side of the tracks to install a second line separate from the M-191 Line within the existing ROW, that installing new drilled shaft foundations on the west side, between the underground Existing Cable and the edge of the right of way while maintaining clearances would not be possible (id.). The installation of new or replacement of existing overhead transmission line structures would require a minimum work-space width of 22 feet for an excavator and triaxle dump truck, and a large staging area, plus room to allow construction vehicles to pass each other along the lengthy construction zone, requiring construction easements from property owners along the length of the ROW; NEP concluded that the Single-Circuit Alternative would be infeasible without the acquisition of extensive additional property rights along the western side of the MBTA ROW (id.).

e. Company Comparison of Alternatives

In the Petition, the Company provided its view of three feasible project alternatives as summarized in Table 2, below, with cost estimates from the time of project alternatives analysis.

Table 2. Company Summary of Feasible Project Alternatives

Alternative	Length	Env. Impact	Provide New Source for Beverly #12?	Project Cost Estimate	Distribution Upgrade Cost	Total Cost NEP + MECo
New Cable (Project)	3.7 mi	Moderate	Yes	$75 M	$24 M	$99 M
Waite St. to East Beverly	3.5 mi	Moderate	No	$66 M	$39 M	$105 M
King St. Alt.	18 mi	High	No	$110 M	$39 M	$149 M

Source: Exh. NG-2, at 37 (table 3-3).

As illustrated in the table above, NEP projects that the King Street Alternative would be considerably more expensive, and would have greater environmental impacts, than either the Project or the Waite Street – East Beverly Alternative (Exh. NG-2, at 37). Comparing the New Cable and the Waite Street – East Beverly Alternative, potential impacts are comparable, as the Waite Street – East Beverly Alternative's shorter length is offset by its greater impacts on the Beverly commercial center (Company Brief at 50, citing Exh. NG-2, at 37). NEP argues that the New Cable facilitates a more cost-effective overall solution for the Beverly/Cape Ann Area and it provides additional reliability for the load served from the Beverly #12 Substation (Company Brief at 50-51, citing Exh. NG-2, at 37). For these reasons, NEP's preferred project approach is the Project – a new transmission cable located in a new manhole and duct bank system connecting the proposed Waite Street Switching Station with the Beverly #12 and East Beverly #51 Substations (Company Brief at 51).

3. Cable Technology Selection

NEP stated that two basic technologies currently are available for 115 kV underground transmission cable systems: high pressure pipe-type ("HPPT") systems and the high voltage extruded dielectric ("HVED") cable technology proposed for this Project (Exh. NG-2, at 40). HPPT cable systems generally consist of three stranded copper or aluminum conductors that are insulated with paper or laminated paper polypropylene tapes and installed in a coated steel pipe

with cathodic protection (id.).[22] The steel pipe is filled with dielectric fluid that is typically maintained at a pressure of approximately 200 pounds per square inch ("psi") with one or more prefabricated fluid pressurizing units (id.). The distance between manholes is typically 2,000 to 3,000 feet (id.). There is also only one remaining manufacturer of HPPT cables worldwide; and the Company identified concerns regarding the potential impact on the environment from fluid releases, increased maintenance cost as circuits age, and the lack of skilled labor to perform repairs (id.).

HVED cable systems incorporate three copper or aluminum conductors, each insulated with an extruded plastic material (Exh. NG-2, at 40). Unlike HPPT systems, HVED systems do not require dielectric fluid for insulation (Exh. NG-2, at 40). Individual single-phase cables are typically installed in plastic conduits within concrete-encased duct banks (id.). HVED cables generally are larger in diameter and heavier than the cables in an HPPT system, and the distance between manholes is typically 1,500 to 1,800 feet, which is a shorter distance than typically required for a HPPT cable system (id.). Installation costs for HVED systems can be higher than for HPPT systems due to the need for additional and larger manholes (id. at 41). Additionally, a concrete-encased duct bank can be more difficult to fit between existing utilities than a steel pipe, resulting in the need to bury an HVED cable system more deeply in locations where there is utility congestion (id.). Conversely, HVED splices and terminations are simpler to construct (id.). NEP stated that installation of the Project in a duct bank-and-manhole system gives the Company the ability to access the cable system through manholes, facilitating inspections and repairs and minimizing the duration of any forced outages (Exh. EFSB-PA-18).

Operating experience to date has generally been positive, but HVED is a newer technology at 115 kV than HPPT (Exh. NG-2, at 40). NEP stated that for the Project, an HVED cable system is less complex, less costly, requires less time to repair, and would be easier to maintain post-energization than an HPPT cable system (Company Brief at 54, citing Exhs. NG-2, at 41, EFSB-PA-16). Furthermore, with only one remaining manufacturer of HPPT cable, NEP

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[22] HPPT cables are not encased in a duct bank (Exh. EFSB-PA-16).

is concerned it would be at risk if issues were to arise with that manufacturer before or after cable energization (Exh. NG-2, at 41).[23]

C. Analysis and Findings on Alternative Approaches

The purpose of the Project is to replace the Existing Cable. An NWA to the cable would need to provide up to 125 MW of energy, and it would need to be able to provide power to the Beverly/Cape Ann area for as long as it might take to repair a contingency on the M-191 Line, which could take 24 hours or longer. The record shows that the Company has installed a battery system on Nantucket, designed to provide 6 MW to the island for eight hours, at a cost of $33 million. A simple extrapolation indicates that a system providing on the order of 50 times more energy, in the event of a contingency, would cost over $1 billion if economies of scale were not considered, and even with any economies of scale would still cost much more than the Project, estimated by the Company in its project alternatives evaluation at $75 million.[24]

The Company's assessment of alternative approaches to the proposed Project also included a review of potential transmission alternatives. One such alternative, like the Existing Cable, would link Waite Street to East Beverly without connecting to Beverly #12 Substation; the record shows that such an alternative would cost $9 million less for transmission work but would cost $15 million more to provide needed local distribution benefits comparable to those of the Project. Since environmental impacts and reliability of this alternative are similar to the Project – with budgeted additional distribution work – the Siting Board finds that the Project is preferable to the Waite Street – East Beverly Alternative.

An alternative of bringing power to East Beverly from the existing 115 kV King Street Substation in Groveland would involve using a route five times longer than the Project at a cost 50 percent higher. The Company also evaluated installation of a new cable following the MBTA

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23 No intervenor argued on brief with respect to project alternatives.

24 While the record shows that NWA solutions do not meet the need for the Project, the Siting Board continues to expect that National Grid will strongly encourage its customers, both existing and new, to take full advantage of energy efficiency programs. National Grid should also continue to explore creative ways to use NWAs (individually or in combination) to avoid or delay the need for new transmission infrastructure.

corridor currently used by the Existing Cable. The record shows that such an alternative would be difficult to install before the Existing Cable is removed, and that safety issues of building and operating along an active railroad would persist. Given these constraints, the Siting Board finds that the Project is preferable to the King Street Alternative and the MBTA Alternatives.

Finally, the record shows that HVED cable technology involves no oil, is less expensive to construct, and is easier to maintain and repair, relative to an HPPT system. Based on its review of non-transmission and transmission alternatives, 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.

V. ROUTE SELECTION

A. Standard of Review

G.L. c. 164, § 69J requires a petition to construct to include a description of alternatives to the facility, including "other site locations." Thus, the Siting Board requires an applicant to demonstrate that it has considered a reasonable range of practical siting alternatives and that its proposed facilities are sited in locations that minimize cost and environmental impacts while ensuring a reliable energy supply. See Town of Sudbury v. EFSB, 487 Mass. 737, 754-755 (2021); Town of Winchester v. EFSB, 98 Mass.App.Ct. 1101 (2020) (unpublished decision). To do so, an applicant must meet a two-pronged test: (1) 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; and (2) the applicant must establish that it identified at least two noticed sites or routes with some measure of geographic diversity. Andrew-Dewar at 34; Sudbury-Hudson at 50; NSTAR Electric Company d/b/a Eversource Energy, EFSB 16-02/D.P.U. 16-77, at 21 (2018) ("Needham-West Roxbury"). But see Colonial Gas Company d/b/a National Grid, EFSB 16-01, at 28 (2016); Colonial Gas Company d/b/a National Grid, EFSB 18-01/D.P.U. 18-30, at 40-41 (2019), where the Siting Board found the company's decision not to notice an alternative route to be reasonable.

B. Company's Approach to Route Selection

NEP described its selection of the Primary Route and Noticed Alternative Route as an iterative process involving an intensive examination of possible routes within a defined geographic area, the collection and consideration of field data, and ongoing consultations with the Massachusetts Department of Transportation ("MassDOT"), MBTA, and municipal officials, all intended to ensure that no clearly superior route was overlooked (Exh. NG-2, at 42, 74-75). In sequence, NEP described a geographic study area; identified and screened individual streets and possible route segments through engineering review and municipal consultation ("primary screening"); compared local roadway segments to eliminate the segments with greater impacts than alternative segments ("secondary screening"); compiled and scored candidate routes based on human, environmental, and constructability criteria; selected the Primary Route based on considerations of cost, reliability, and environmental impacts; and selected the Noticed Alternative Route based on the same considerations, plus geographic diversity (id. at 42, 74). These steps are described further below.

NEP identified a geographic study area intended to encompass all feasible routes for an underground transmission cable between the Project termini (Exh. NG-2, at 42). First, the Company limited the study area to locations north of the new Waite Street Switching Station in Salem and west of undeveloped parcels with no existing rights-of-way in the area of East Beverly #51 Substation (id.). Further, the Company bound the study area by Beverly Harbor, the Danvers River, Bass River, and, north and east of Beverly #12 Substation, by the MBTA's Eastern Route Main Line and Gloucester Branch (id. at 42, 43, 45 (fig. 4-1)).

NEP then pared the universe of potential routes within this study area using three general guidelines:

- Direct routes should be preferred to more circuitous routes;
- Established ROWs (including roadways) should be used where possible and use of private property should be avoided; and
- Project costs should be minimized by avoiding routes with complex engineering and construction characteristics (Exh. NG-2, at 42, 44).

The Company stated that it used these guidelines with a view to supporting selection of a route that has the least impact to the human (a.k.a. built) and natural environment, and that is constructible and able to meet reliability requirements at the lowest cost (Exh. NG-2, at 42). Specific to its guideline to minimize Project costs, the Company indicated that significant cost factors include route length; the number and degree of bends along the route; the need to acquire easements or other forms of property rights; the presence of shallow rock, ledge, or groundwater; land uses and traffic conditions along the route that may affect construction timing; and the number of difficult crossings of features requiring special engineering techniques (e.g., active railroads, large culverts) (id. at 44). Thus, the Company preferred routes with fewer features that could increase the overall Project cost (id. at 44).

NEP next mapped potential streets within the study area that could be used to develop a relatively direct route between all Project termini (Exh. NG-2, at 46). Within Salem, to avoid construction on Bridge Street (Route 1A) to the extent feasible, this step limited the selection to a route that heads north out of the switching station parcel along Waite Street then turns west onto Pierce Avenue for approximately 250 feet before turning north onto Bridge Street and attaching to the Veterans Memorial Bridge (id.). The Company also identified a potential variation of using Merrill Avenue ("Merrill Avenue Variation") as a work-around for all candidate routes should it be necessary to maintain truck access via Pierce Avenue to the adjacent Salem LNG facility (id.).[25]

In a separate analysis involving an engineering evaluation of the best techniques for the New Cable to cross the Danvers River, the Company considered an overhead alternative, an HDD alternative, a direct-buried submarine cable alternative, and an on-bridge alternative (Exh. NG-2, at 37-40).[26] The overhead alternative is a relatively low-cost crossing alternative ($5.48 million), but it would require the installation of four new transmission structures within the Danvers River, with significant environmental impacts to the river, and would likely extend

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[25] The Salem LNG facility is off Pierce Avenue (Exh. NG-2, at 46).

[26] The Project Study Area in Salem is on a narrow, easterly peninsula connected to Beverly by the Veterans Memorial Bridge (Exh. NG-2, at 46). Options for crossing the bridge would be common to all considered routes (id.).

the Project schedule due to extensive permitting and time-of-year construction restrictions as well as requiring additional property rights from the MBTA (id. at 38). Use of an HDD is a relatively high-cost crossing alternative ($7.54 million) and would likely involve handling of contaminated soils at the Salem end of the HDD around the LNG facility, and acquisition of property rights somewhere in Beverly for the other end (id.).

NEP considered a direct-buried submarine cable alternative, as one of the four alternatives for crossing the Danvers River (Exh. NG-2, at 39). The Company stated that it would need to remove the Existing Cable, which is also direct buried, before installing a new cable, which would have significant adverse reliability implications; also, river dredging would be required to install (or repair) a direct-buried cable, and the option is relatively high cost ($8.72 million) (id.). The fourth alternative, and the one the Company selected, is to mount ductwork on the underside of the Veterans Memorial Bridge (Route 1A) (constructed in 1996) at an estimated cost of $3.16 million (id.; RR-EFSB-6). On January 2, 2019, MassDOT confirmed that use of the bridge would not interfere with the bridge structure and function (Exh. NG-2, at 39). The Company characterized the bridge alternative as having reduced environmental impacts, a shorter permitting timeline, ease of maintenance, and increased reliability, compared to the other alternatives, and selected it for the Danvers River crossing (id. at 39-40).

NEP stated that it undertook several key planning and outreach initiatives, including meetings with department heads from the Cities of Beverly and Salem, to discuss potential locations for the Project, obtain input on the proposed routes, and determine whether siting a new duct bank and manhole system within these streets would conflict with City projects or facilities (Exh. NG-2, at 49). For Beverly, where the widest range of possible routes is available, the Company stated that it met with the Mayor, Chief of Staff, Commissioner of Public Services and Engineering, City Engineer, City Planner, and City Council to discuss the routing analysis (id.). NEP stated that it eliminated several streets from consideration based on preliminary field investigations and meetings with the City of Beverly (id.).[27]

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[27] Rantoul Street, Lothrop Street between Water and Hale, Lovett Street, Abbott Street, Cedar Street/Victor Avenue, West Dane Street, and Dane Street were dismissed for reasons such as recent street reconstruction, roadway flooding concerns, beach traffic and

Among the still-extensive list of potential contiguous routes after these streets were eliminated from consideration, the Company then identified some locations where a head-to-head comparison could be used to eliminate inferior short segments (Exh. NG-2, at 49). For instance, Porter Street was eliminated because the generally parallel Wellman Street would be shorter and avoid a public park in the Goat Hill neighborhood (id.). As another example, between Park Street and Cabot Street in downtown Beverly, Broadway and Wallis Street were determined among other factors to have less residential impact than Federal Street, Bow Street, Railroad Avenue or Pleasant Street, and the latter were eliminated (id.).

Following this secondary screening, six different feasible routes remained, encompassing a total of approximately 25 streets (id. at 59-60). These six routes are shown in Figure 2, below.

Figure 2. Six Route Alternatives for Beverly-Salem

Source: Exh. NG-2, at 64 (fig. 4-10).

For these six routes, the Company scored each for the following 14 criteria; each criterion

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impact on tourism, known burial grounds within roadway, and having more severe road bends than alternatives (Exh. NG-2, at 49).

was assigned a weighting factor, as shown in Table 3, below (Exh. NG-2, at 69-70).[28]

Table 3. Route Scoring Criteria and Corresponding Weights

Category	Scoring Criteria	Weight
Built Environment Criteria	residential units	3
	commercial and industrial units	2
	sensitive receptors	2
	public transit	1
	historical and archaeological resources	1
	Traffic	3
Natural Criteria	public shade trees	1
	wetland resources	1
	subsurface contamination	1
Constructability Criteria	route length	1
	utility density	3
	route bends	1
	street width	2
	shallow bedrock	3
Source: Exh. NG-2, at 69-70		

The Company also estimated construction costs for each. The Company's weighted scores (low is better) and costs are shown in Table 3, below.

[28] The Company explained that, consistent with previous projects, it developed a route evaluation scoring technique for 14 route selection criteria herein (RR-EFSB-13). As the raw scores for various criteria have different scales and units (e.g., resource counts, or resource miles), NEP calculated a ratio score, using the highest impacted route as the denominator, such that a ratio score (running from zero to one) was calculated, representing the ratio of each candidate route's raw score relative to the highest raw score of that route selection criteria category (id.; Exh. NG-2, at 69, 70 (tables 4-6, 4-7)). NEP then multiplied each of the ratio scores by weights of 1, 2, or 3, as listed above, to reflect the Company's view of the magnitude of importance of respective criteria in the scoring process, to produce the weighted score (Exh. NG-2, at 69, 70 (tables 4-6, 4-7); RR-EFSB-13).

Table 3. Weighted Scores and Costs of Six Route Alternatives (Cable Only)

Route Name (and major streets used in Beverly)[29]	Weighted Score	Estimated Cost (millions)[30]
Broadway-Thorndike-Hale (*the Primary Route*) (Wellman/Park/Broadway/Thorndike/Endicott/Hale/Lothrop/Cross)	18.85	$39.3
Essex-Pearl-Lake Shore (*the Noticed Alternative Route*) (Wellman/Park/Roundy/Charnock/Essex/Pearl/Lake Shore/Cross)	19.03	$41.7
Wallis-Hale (Wellman/Park/Wallis/Cabot/Hale/Lothrop/Cross)[31]	19.51	$39.3
Essex-Pearl-Corning (Wellman/Park/Roundy/Charnock/Essex/Pearl/Corning/Lothrop/ Lake Shore/Cross)	19.84	$42.6
Roundy-Charnock-Bisson (Wellman/Park/Roundy/Charnock/Essex/Bisson/Lothrop/ Lake Shore/Cross)	20.68	$41.1
Cabot-Hale (Cabot/Hale/Lothrop/Cross)	21.29	$39.3

Source: Exh. NG-2, at 64 (table 4-11), 74 (fig. 4-10).

In identifying a Noticed Alternative Route, NEP looked for a candidate route with significant geographic diversity from the Primary Route and avoiding use of the same streets (Exh. NG-2, at 74). Of the remaining routes, Essex-Pearl-Lake Shore has the least overlap with the Primary Route; Essex-Pearl-Lake Shore also received a low weighted ratio score, reflecting

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29 Routes listed for Wellman and Park Streets also traverse parts of Congress Street, Webber Avenue, Beverly #12 Substation, and Pleasant Street (Exh. NG-2, at 64 (fig. 4-10)).

30 Cost estimates include a contingency of 30 percent and do not include the cost of the substation work, Veterans Memorial Bridge Crossing, and removal of the Existing Cable (common to all routes) or hazardous material handling and disposal (Exh. NG-2, at 71). Each cost estimate is characterized as a -25% / +50% estimate (Tr. 1, at 72-73).

31 The Wallis-Hale route originally had a criteria score of 18.63 and was initially selected as the Company's preferred route (Exh. NG-2, at 68-70). However, NEP revisited environmental impacts and constructability constraints when it learned of two major mixed-use developments planned for the Rantoul Street area, and the score for the Wallis-Hale route increased to 19.51; the Company instead selected the Broadway-Thorndike-Hale route as its preferred route (id. at 71-74). These cost estimates do not include the cable installation over the Veterans Memorial Bridge (id. at 71).

comparatively low impacts across the board, and particularly low scores for commercial/industrial land uses, sensitive receptors, public transit, and historical/archeological resources (Exh. NG-2, at 74). For these reasons, NEP selected Essex-Pearl-Lake Shore as its Noticed Alternative Route (Exh. NG-2, at 74-75).

The Primary Route and the Noticed Alternative Route are shown above in Figure 1. The Company described both routes as including the Merrill Avenue Variation (Exh. NG-2, at 75).

C. Geographic Diversity

NEP asserted that it selected a Noticed Alternative Route with an appropriate measure of geographic diversity for further consideration in a more detailed comparison to the Primary Route (Exh. NG-2, at 75). Figure 2 shows the diversity of routes at the stage when routing was narrowed to six routes. Although segments of the analyzed routes overlap, each route identifies some measure of geographic diversity and has varying environmental impacts (RR-EFSB-14).

D. Positions of the Parties

1. James Rome

Dr. Rome argues that the replacement cable should be placed somewhere else besides Webber Avenue or, alternatively to disable the gas line located in Webber Avenue (Rome Brief at 1). Dr. Rome asserts that the part of River Street that was "dismissed" as a route candidate, should be considered as a potential route (id.). Dr. Rome argues that the feasibility of using River Street has been demonstrated (id., citing Tr. 2, at 200-208). Dr. Rome suggests that the proposed route go about 100 feet north of the intersection with Webber Avenue, so that the location where the route crosses the 60 pounds per square inch gauge, gas line is at least 200 feet away from the nearest residence (Rome Brief at 1).

2. Company Response

With respect Dr. Rome's proposed routing change, NEP argues that, as part of its route selection process, it evaluated the possibility of direct route segments within the Goat Hill neighborhood, specifically (1) Congress Street to Porter Street to Webber Avenue, and (2) Congress Street to Wellman Street to Webber Avenue; in addition, the Company reviewed

direct route segments bordering Goat Hill, including Rantoul Street and School Street to River Street (Company Reply Brief at 9-10, citing Exh. EFSB-3-4). NEP argues that its route selection process considered that route segments in the Goat Hill area would eliminate or partially eliminate use of Webber Avenue (Company Reply Brief at 11). However, the Company ultimately did not select these segments as its Primary Route, as described below.

Based on preliminary field investigations and meetings with the City of Beverly, the Company eliminated from consideration early in its route selection process several streets, including Rantoul Street (because it is a main throughway), School Street (because of the poor condition of the bridge over the MBTA railroad tracks), and River Street (because of historic and future roadway flooding concerns) (Company Reply Brief at 10, citing Exh. EFSB-3-4, Tr. 1, at 92, 94, Tr. 2, at 205). The Company evaluated a route from Wellman Street to School Street to River Street, but because two of these streets are classified as roads that connect local streets with arterials, and because River Street serves the commuter rail station, use of this route would have traffic impacts during the morning and afternoon commutes (Company Reply Brief at 10, citing Exh. EFSB-3-4, Tr. 1, at 95).[32] Additionally, NEP argues that keeping the route on River Street to bypass Webber Avenue would not avoid collocation with the existing gas line (which it indicates is present along River Street as far as Federal Street) nor with the historically flooded portions of River Street (Company Reply Brief at 10, citing Exh. EFSB-3-4, Tr. 1, at 100). Furthermore, to allow for an appropriate approach to the riser structure within the Beverly #12 Substation, the New Cable would still need to enter the station near the Webber Avenue and River Street intersection, and an additional crossing of the Existing Cable would be required (Company Reply Brief at 10, citing Exh. EFSB-3-4; Tr. 1, at 100). Because the New Cable needs to be in service before the Existing Cable is removed, this overlap would create additional constructability challenges and this pathway would add approximately 185 feet of length and at

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[32] NEP argues that if River Street north of Webber Avenue is closed or restricted, even for a short distance and time, longer detours may also be necessary (Company Reply Brief at 10, citing Exh. EFSB-3-4). Further, the Company suggests congestion may ensue because there are "no right turn" restrictions between 7:00 and 9:00 a.m. from River Street southbound onto Webber Street and School Street (id.).

least two hard bends to the route of the New Cable (Company Reply Brief at 10-11, citing Exh. EFSB-3-4; Tr. 2, at 208-211).

NEP argues that its route selection process demonstrated that the Congress Street to Wellman Street to Webber Avenue route segment through Goat Hill is preferable in terms of constructability, cost, and impacts to the community; the Company chose to include this route segment as part of the Primary Route for the New Cable (Company Reply Brief at 11). The Company further argues that the safety considerations raised by Dr. Rome are addressed in the Company's design and implementation of the New Cable (id.). See Section VI.D.6. Consequently, NEP argues, there is no need to re-route the Webber Avenue segment of the Project route (id.). Finally, the Company asserts that such a change would be inconsistent with standards of the Siting Board and would result in greater construction challenges and impacts and higher costs – to the detriment of the community and the Company's customers (Company Brief at 11).

Overall, NEP argues that the Company objectively and comprehensively developed and assessed a wide array of potential routes within the bounds of a defined study area so that no clearly superior route was overlooked or ignored (Company Reply Brief at 9). The Company contends that it developed and applied a reasonable set of criteria for identifying and evaluating alternative routes (id.). NEP asserts that it systematically compared the candidate routes based upon these reasonable criteria and, at the conclusion of this process, identified a Primary Route and a Noticed Alternative Route that best balance environmental impacts, costs, and reliability and enable the Company to meet the identified need (id.). NEP argues that the Siting Board should approve the Company's route selection process as well as the Company's selection of the Primary Route as the route for the New Cable (id.).

E. Analysis and Findings on Route Selection

The Siting Board requires that applicants consider a reasonable range of practical siting alternatives and that proposed facilities are sited in locations that minimize cost and environmental impacts. In past decisions, the Siting Board has found various criteria to be appropriate for identifying and evaluating route options for transmission lines and related

facilities. These criteria include natural resource impacts, land use impacts, community impacts, cost, and reliability. Andrew-Dewar at 43; Sudbury-Hudson at 71; Stoughton-Boston 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 route selection process. Andrew-Dewar at 43; Sudbury-Hudson at 71; Boston Edison Company, EFSC 89-12A, at 34-38 (1989).

The Company evaluated a multitude of potential routes within a study area between the Project termini and roughly bounded (in Beverly) by the Gloucester Branch of the Eastern Main Line MBTA corridor on the north and Beverly Harbor on the south. Other than the rail line itself, the Company restricted its evaluation to public roadways, on account of the highly developed nature of the area and the absence of developable rights-of-way.

Within this study area, NEP adopted general guidelines including avoidance of circuitous routes and routes with complex engineering and construction. Continuing its evaluation, the Company considered a number of factors including: residential units, traffic, utility density, and shallow bedrock, commercial and industrial units, sensitive receptors, street width, public transit, historical and archaeological resources, public shade trees, wetland resources, subsurface contamination, route length, and route bends. Using an iterative process, NEP reduced the routing choices to two that offered relatively low costs and low environmental impacts and were deemed most advantageous. In a separate process, the Company evaluated a number of different potential options for crossing the Danvers River, eventually selecting use of the conduit on the underside of the Veterans Memorial Bridge. The Siting Board finds this approach to be reasonable.

With respect Dr. Rome's contention that the New Cable should be installed somewhere besides Webber Avenue, the record shows that the alternative of River Street instead of Webber Avenue has some construction disadvantages such as potential local flooding, heightened traffic impacts near the commuter rail station, and higher cost. The Siting Board finds that the Company engaged in substantial analysis of alternatives to Webber Street and further finds the Company's inclusion of Webber Avenue as part of its Primary Route to be reasonable. Dr. Rome's specific safety concerns about installing an underground electric cable near an existing gas main are addressed in Section VI.D.6, below.

The record shows that the Company used appropriate siting considerations and established Siting Board precedent, in winnowing down a universe of potential routes to six feasible routes for further analysis in its route selection process. None of the routes eliminated in this initial screening phase demonstrated any particular advantages not otherwise captured by one or more of the remaining routes under consideration. Accordingly, the Siting Board considers the Company's process that identified six feasible routes to be appropriate, as these initial steps for route selection are consistent with the criteria, outreach process, and analytical approaches the Siting Board has previously found acceptable. See Andrew-Dewar at 43-44; Sudbury-Hudson at 71; NSTAR Electric Company d/b/a Eversource Energy, EFSB 15-04/D.P.U. 15-140/15-141, at 65 (2018) ("Woburn-Wakefield").[33]

The Company then developed and applied a quantitative scoring system for ranking the six routing options. Based on its evaluation of environmental impacts, cost, and reliability, the Company selected: (1) the Broadway-Thorndike-Hale Route as the Primary Route; and (2) the Essex-Pearl-Lake Shore Route as the Noticed Alternative Route.[34] The weighting and ratio methods used by the Company provide a balanced consideration of impacts to the natural and human environments, as well as Project constructability and estimated cost. The Siting Board also notes that much of the route selection process has been guided by considerations expressed by engineering officials of the cities of Salem and Beverly.

With regard to geographic diversity, the Company identified a Noticed Alternative Route which generally uses different streets from the Primary Route. The Siting Board concludes that the Essex-Pearl-Lake Shore Route is sufficiently geographically diverse from the Broadway-Thorndike-Hale Route.

Based on the route selection process described above, the Siting Board finds that the

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33 This Siting Board's acceptance of this general route selection methodology was upheld on appeal by the Supreme Judicial Court ("SJC") and the Massachusetts Appeals Court. Town of Sudbury v. Energy Facilities Siting Board, 487 Mass. 737 (2021) ("Sudbury v. EFSB"); Town of Winchester v. Energy Facilities Siting Board, 98 Mass.App.Ct. 1101 (2020) (unpublished decision) ("Winchester v. EFSB").

34 As indicated in Section V.B, above, the Merrill Avenue Variation is a possibility for both the Primary and Noticed Alternative Routes.

Company has: (1) developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner that ensures that they have not overlooked or eliminated any routes that are on balance clearly superior to the proposed Project; and (2) identified a range of 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 and that its proposed facilities are sited in locations that minimize cost and environmental impacts while ensuring a reliable supply.

VI. ANALYSIS OF THE PRIMARY AND NOTICED ALTERNATIVE ROUTES AND COMMON PROJECT ELEMENTS

In this section, the Siting Board analyzes the Broadway-Thorndike-Hale Route (Primary Route) and the Essex-Pearl-Lake Shore Route (Noticed Alternative Route) based on environmental impacts, cost, and reliability.[35] 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. See Town of Sudbury v. EFSB, 487 Mass. at 1165. 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. Andrew-Dewar at 44; Sudbury-Hudson at 78; Needham-West Roxbury at 32.

The Siting Board first determines whether the petitioner has provided sufficient information regarding environmental impacts and potential mitigation measures to enable the

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[35] The relatively short Merrill Avenue Variation is a possibility for both routes; traffic impacts of the Merrill Avenue Variation are considered in Section VI.D.7.

Siting Board to make such a determination. The Siting Board then examines the environmental impacts of the proposed facilities 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 routes 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. Andrew-Dewar at 45; Sudbury-Hudson at 78; Needham-West Roxbury at 32.

B. Description of the Primary and Noticed Alternative Routes and Common Project Elements

1. New Cable

NEP has identified an approximately 3.74-mile Primary Route and an approximately 4.12-mile Noticed Alternative Route for its New Cable (Exh. NG-2, at 1, 77-80). Both routes begin at the proposed Waite Street Switching Station; both would cross the Danvers Rivers in a new conduit underneath the decking of the Veterans Memorial Bridge; they both pass through and connect to NEP's Beverly #12 Substation at 44 River Street; and they both terminate at NEP's East Beverly #51 Substation at 89 Boyles Street (id.). A map of the Primary and Noticed Alternative Routes is included above, in Section I.A (see Figure 1).

The Primary Route and the Noticed Alternative Route each begin as an overhead tap off an existing 115 kV overhead transmission line at the proposed Waite Street Switching Station (Exh. NG-2, at 77-79). Both routes transition underground within a new duct bank and manhole system that runs beneath Waite Street, Pierce Avenue, and Bridge Street (id.). The routes turn west at Pierce Avenue, then to the north onto Bridge Street (Route 1A, a state roadway in Salem), continuing for 0.25 miles before reaching the Veterans Memorial Bridge, connecting Salem and Beverly (id.). NEP proposes the use of the Merrill Avenue Variation for both the

Primary and Noticed Alternative Routes as a potential work-around should it be necessary to maintain truck access via Pierce Avenue to the adjacent Salem LNG facility (id. at 46).[36]

The two routes cross the Danvers River via conduits on the underside of the Veterans Memorial Bridge, making landfall in Beverly and returning underground (Exh. NG-2, at 77). Both routes travel approximately 300 feet along Congress Street and an at-grade MBTA railroad crossing using an existing distribution conduit (id. at 77, 79).[37] The routes then turn northward at Wellman Street, passing through residential neighborhoods for approximately 1,140 feet (id.). The New Cable along either route would then continue northeast for approximately 400 feet along Webber Avenue to enter the Beverly #12 Substation just before the intersection of Webber Avenue with River Street (id.). Exiting the substation at the intersection of River Street and Pleasant Street, both routes follow Pleasant Street east and then Park Street north (id. at 79).[38]

The Primary Route turns east onto Broadway to its intersection with Cabot Street, and then continues straight onto Thorndike Street, Endicott Street, and Monument Square (Exh. NG-2, at 79). Subsequently, the Primary Route turns onto Hale Street, followed by Lothrop Street, Cross Lane, and Boyles Street until reaching the access road for the East Beverly #51 Substation, where it turns south to enter the substation property (id.).

The Noticed Alternative Route follows the same path as the Primary Route until it reaches Park Street in Beverly (Exh. NG-2, at 79). Rather than turning onto Broadway, the Noticed Alternative Route continues northeast beneath Park Street for an additional 2,000 feet; it then follows Roundy Street, Cabot Street, and Charnock Street (id.). At the intersection of Charnock Street and Essex Street (Route 22), the Noticed Alternative Route turns northeasterly onto Essex Street, then along Newbury Street, Pearl Street, Pearl Street Extension, and Lake

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36 The Company considered Pierce Avenue preferable to Merrill Avenue because: (1) Bridge Street is more heavily trafficked than either Pierce or Merrill Avenue; and (2) the Merrill Avenue Variation uses a longer section of Bridge Street than does the Pierce Avenue route (Exh. NG-2, at 46).

37 In the event the existing casing is unusable, NEP plans a jack-and-bore installation of a new casing at this location (Exh. NG-2, at 77).

38 On Pleasant Street, the common segment of the routes passes beneath an elevated section of the MBTA ROW (Exh. NG-2, at 79).

Shore Avenue (id.). The Noticed Alternative Route turns east onto Cross Lane where it rejoins the Primary Route along Cross Lane and Boyles Street before reaching the East Beverly #51 Substation access road (id.).

2. Switching Station and Substations

Constructing the New Cable along either the Primary or Noticed Alternative Route would require construction of the new Waite Street Switching Station and the same upgrades at NEP's existing Beverly #12 and East Beverly #51 Substations (Exh. NG-2, at 5-6, 110-119). NEP would construct the Waite Street Switching Station on a Company-owned parcel in Salem (id. at 118). The Waite Street Switching station would include: a control house elevated six feet above grade; a 115 kV aluminum bus support structure; a 115 kV current transformer support structure with six current transformers; a 115 kV circuit switcher structure; a 115 kV riser terminator structure; and one H-frame dead-end structure (id.). In addition, NEP would construct a sidewalk on Ferry Street adjacent to the new switching station (id.).

To connect the New Cable to the Beverly #12 Substation, NEP would install the following equipment: two riser termination structures; four single pedestal bus support structures; one lower/upper diagonal bus support structure; two group disconnect structures; one 115 kV circuit switcher; a second 115/13.2 kV transformer; 115 kV capacitor coupled voltage transformers ("CCVTs") for the M-191 Line and New Cable; and various upgrades to the 13.2 kV distribution yard (Exh. NG-2, at 111).[39] The Project would require a small expansion of the substation's fenceline by 20 feet to the north and 25 feet to the west (id.). The Company would also raise certain existing equipment and install additional equipment two to three feet above the area's base flood elevation to address the potential for increased inundation due to sea level rise (id.). This subject is addressed in more detail at Section VI.D.2.a.

To connect the New Cable to the Beverly #51 Substation, NEP would construct one new 115 kV riser structure and a new disconnect switch on a new 115 kV H-frame structure

[39] Upgrades specific to the 13.2 kV yard would include extension of the existing tie bus and installation of eight 13.2 kV circuit breakers, six voltage regulators, two capacitor banks, and riser structures (Exh. NG-2, at 111).

(Exh. NG-2, at 115). The Company would also relocate CCVTs and install associated conduits, remove the existing N-192 115 kV riser termination structures and dielectric fluid reservoirs, and replace certain existing 115 kV disconnect switches (id. at 6, 115). Improvements at the Beverly #51 Substation would not require fence line expansion (id. at 115).

3. Existing Cable

The Existing Cable starts at the Company's North River #30 Terminal in Salem, proceeds north across the Danvers River (via a submarine cable crossing) to Congress Street in Beverly (Exh. NG-2, at 121). The Existing Cable proceeds east on Congress Street, turns north on Wellman Street, then east onto Webber Ave before entering the Company's Beverly #12 Substation (id.). The Existing Cable exits the Beverly #12 Substation onto River Street and proceeds north to a point near McPherson Drive, where the Existing Cable enters the MBTA ROW, which it follows east for approximately 2.1 miles before entering the East Beverly #51 Substation (id.).

C. General Description of Project Construction

NEP described the construction methods that would be used for the Primary and Noticed Alternative Routes, the Waite Street Switching Station, and upgrades to the existing Beverly #12 and Beverly #51 Substations (Exh. NG-2, at 82). In-street construction along either route would consist of five stages: (1) installation of soil and erosion controls and other mitigation measures, as appropriate; (2) manhole installation; (3) trench excavation, duct bank installation, and pavement patching; (4) cable pulling, splicing, and testing; and (5) final pavement restoration (id.).[40] NEP anticipated that the in-street installation of manholes, installation of the duct bank, and temporary pavement restoration using asphalt would take approximately 18 months in total (id. at 84). Trench excavation for the duct bank would be to a width of up to four feet and a depth of five to eight feet or more, depending on site conditions (id. at 82). NEP indicated that

[40] NEP explained that it would repeat these phases in sequence at each location and that it would likely undertake several phases of construction simultaneously in different sections of the Project (Exh. NG-2, at 82).

substation upgrades would be constructed concurrently with New Cable installation (id.). The Company described the methods it would use to install Project conduits on the Veterans Memorial Bridge, as well as work associated with the removal of the land and submarine portions of its Existing Cable and related equipment at North River #30 Terminal (id. at 82, 87). After the New Cable, Waite Street Switching Station, and substation improvements are constructed and energized, the Company plans to remove the Existing Cable (Exh. NG-12, at 121).

1. Soil and Erosion Controls

NEP represented that it would implement best management practices ("BMPs") to control work site erosion and sedimentation (Exh. NG-2, at 83). NEP committed to marking the boundaries of wetlands and work areas prior to initiating construction to prevent unauthorized vehicle encroachment into wetland areas (id.). The Company would also follow any special conditions imposed by the Salem or Beverly Conservation Commissions in their Orders of Conditions, including use of erosion/sedimentation control devices such as straw or hay bales and siltation fencing (id.). The control devices would serve as a physical boundary between work zones and wetland resource areas (id.).

The Company anticipated its planned erosion control measures (i.e., covering storm drains with filter fabric and carefully testing and disposing of excavated soil at an approved recycling or disposal facility) would limit the potential for soils to migrate into the municipal storm drain system (Exh. NG-2, at 83). The Company would use suitable material to backfill any excavation (id.).

To monitor the effectiveness of measures taken to protect wetlands, the Company would retain an environmental monitor to inspect construction areas weekly (Exh. NG-2, at 83, 89). NEP stated that it would not modify any existing stormwater structures (e.g., culverts, catch basins, drainage ditches) as part of the Project and that all pavement/surfaces would be restored to existing grades after Project construction (Exh. EFSB-W-4).

2. Manhole Installation

Manholes are large, pre-cast concrete vaults installed underground where individual cable segments are spliced together; during operations, manholes allow access for cable maintenance and repairs (Exh. NG-2, at 83). Manhole depth would vary by location, with the base of the manhole typically ten to twelve feet below grade (id.). The Company expects manhole dimensions to be approximately ten feet wide, 26 feet long, and 10 feet tall; final dimensions may vary based on space needed for cable pulling and splicing (id.). Manholes would be placed approximately every 1,500 to 1,800 feet along the route selected (id.). The Company would install twelve manholes along the Primary Route and thirteen along the Noticed Alternative Route (Exh. EFSB-LU-6). The Company selected manhole locations to (1) minimize the relocation of utilities during installation, and (2) avoid blocking driveways during cable pulling (Tr. 1, at 116-117).[41]

Manhole installation requires eight to eleven working days and consists of two separate construction activities: (1) manhole installation, which requires five to eight working days, and (2) duct bank installation for the manhole approaches, which requires three working days (Exhs. EFSB-CM-5; EFSB-NO-3). The Company anticipates four to six working days at each manhole for cable pulling, and another six working days at each manhole for cable splicing (Exh. EFSB-CM-5; EFSB-NO-3). Total construction time at each manhole location is 18 to 23 workdays (Exh. EFSB-CM-5; EFSB-NO-3).

3. Trench Excavation, Duct Bank Installation, and Pavement Patching

The underground duct bank would be installed using open-cut trenching (Exh. NG-2, at 83). The Company would first mark the extent of the trench and contact Dig Safe to locate and mark existing utilities (id. at 83-84). The Company would saw cut the pavement, break it up with pneumatic hammers or excavators, then truck it (separately from excavated soils) for recycling at an asphalt batching plant or other approved facility (id. at 84; Tr. 2, at 277-278).

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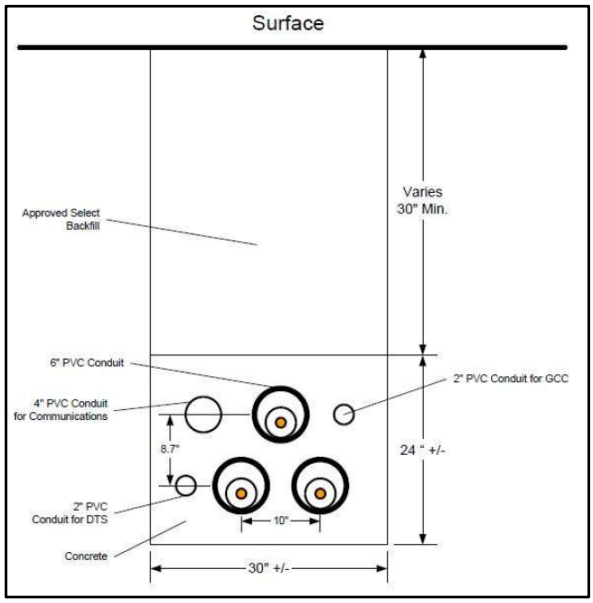
41 The Company also considered allowable pulling tensions, available space, bends or sharp turns between manholes, the maximum length of cable transportable on a reel, and the allowable voltage rise on the cable shield (Exh. NG-2, at 83; Tr. 1, at 116; Tr. 2, at 237).

NEP stated it would remove rock by mechanical means rather than by blasting (Exh. EFSB-CM-3; RR-EFSB-8).

The trench would be excavated using a backhoe or excavator (Exh. NG-2, at 84). In some areas hand or vacuum excavation may be necessary to avoid disturbing existing utilities (Exh. NG-2, at 84; Tr. 1, at 141-143). The Company stated it would sheet/shore trenches in accordance with Occupational Safety and Health Administration ("OSHA") safety rules (Exh. NG-2, at 84). Trench sheeting and shoring should progress at approximately 40 to 100 feet per day (id.). Rather than stockpiling soil adjacent to the trench, NEP would load excavated soil directly into dump trucks for off-site recycling, disposal, or reuse (id.).

The Company would then assemble and lower polyvinyl chloride ("PVC") conduit into the excavated trench segment, and then add high strength thermal concrete to the trench to protect the conduits (Exh. NG-2, at 84). Thereafter, the Company would backfill the trench, and temporarily patch the affected pavement (final pavement restoration discussed in Section VI.C.5, below) (id.).[42] Figure 3, below, displays a typical duct bank cross section.

Figure 3. Typical Duct Bank Installation Cross-Section of the New Line



Source: Exh. NG-2, at fig. 5-3.

42 The Company stated it would coordinate with Salem, Beverly, and MassDOT officials on pavement work and location-specific construction schedules (Exh. NG-2, at 82).

According to NEP, pavement cutting, trench excavation, duct bank installation, and pavement patching at a given business or residence would typically take two to three weeks (Exhs. NG-2, at 86, EFSB-CM-4). Pavement removal and trench excavation would take place simultaneously, with the trench being open approximately 100 to 150 feet in front of the duct bank assembly operation (Exh. EFSB-CM-4). Duct bank construction, including conduit assembly and concrete pouring, would require an additional 100 to 150 feet, and final backfilling and temporary pavement installation would occupy another 100 to 150 feet (id.). Field conditions, including utility crossing, traffic congestion, and the depth of installation, would affect the rate of construction (id.).

During construction, NEP would make "every reasonable effort" to maintain access to adjacent residences and businesses (Exh. NG-2, at 86). The Company noted that construction might temporarily impede access, but that steel-plated trench covers would provide access to nearby homes and commercial buildings, as necessary (id.). At the end of each workday, NEP would cover any open trenches with securely anchored steel plates (id.).

According to NEP, Project construction would probably require trenchless crossings at a minimum of three locations: the MBTA at-grade rail crossing at Congress Street, required for both the Primary and Noticed Alternative Routes; the crossing of River Street at Pleasant Street adjacent to the Beverly #12 Substation, required for both the Primary and Noticed Alternative Routes; and the Broadway crossing at Rantoul Street, required for the Primary Route, or the Roundy Street crossing at Rantoul Street, required for the Noticed Alternative Route (Exh. NG-2, at 87).[43] The Company stated it would likely use jack-and-bore construction for trenchless crossings. NEP noted that jack-and-bore construction is generally favored for crossings of less than 200 feet (e.g., railroads, ditches, streams, existing utilities) (id.).[44]

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43 Some adjustment in the location and number of trenchless crossings might occur depending on field conditions encountered for the Project in the final design stages (Exh. NG-2, at 87).

44 NEP explained that a jack and bore installation involves digging a bore pit on one side of the feature to be crossed and a receiving pit on the other side (Exh. NG-2, at 88). The bore pit houses the drilling and jacking equipment; with this equipment, workers push a pipe and cable(s) from the bore pit underneath the feature being crossed to the receiving

4. Cable Pulling, Splicing, and Testing

To install each cable section, NEP would pull the cables through the conduits between adjacent manholes (Exh. NG-2, at 86). The Company anticipated that a section of cable pulling would require two to three eight-hour days (id.). NEP would splice adjacent cable together in the manholes using a splicing van and a portable generator, which usually takes four or five extended workdays at each manhole location (id.). Typically, the Company parks the splicing van at one manhole access cover, an air conditioner and ventilation fans near a second manhole access cover, and the generator (muffled to minimize noise) at a location chosen to minimize traffic restrictions near the work zone (id.). After installation of the complete cable system, NEP would field-test the New Cable from the substations (id.). After a successful test, the Company would energize the New Cable (id.).

5. Final Pavement Restoration

NEP would patch pavement temporarily after completion of in-street construction (Exh. NG-2, at 82).[45] Permanent pavement restoration is governed by the Salem MOA and the Beverly MOA (Exhs. EFSB-CM-15(S1)(1); EFSB-CM-15(S2)(1)). Pursuant to the Salem MOA, the Company must repave all streets excavated in connection with the Project in Salem (Exh. EFSB-CM-15(S1)(1) at 3). Pursuant to the Beverly MOA, the Company would permanently patch excavated areas, and it would pay the City of Beverly $2.75 million for final pavement restoration in Beverly (Exh. EFSB-CM-15(S2)(1) at 7).

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pit (id.).

45 Any pavement repair would be consistent with requirements of the Beverly Department of Public Works ("DPW"), the Salem DPW, the Massachusetts Department of Transportation ("MassDOT"), and the Public Utility Road Restoration Standards, D.T.E. 98-22, att., Standards §§ 1.0-12.0 (August 26, 1999), to the extent the standards do not conflict (Exh. NG-2, at 82).

6. Danvers River Crossing

To cross the Veterans Memorial Bridge, six conduits, each approximately 1,650 feet long, would be mounted in a utility bay beneath the bridge (Exh. NG-2, at 87). NEP would install all hangers and supports for the New Cable in accordance with MassDOT requirements, using temporary suspended platforms and/or vehicle-mounted under-bridge work platforms (id.). NEP stated it would submit a non-vehicular access permit and traffic management plan ("TMP") to MassDOT; the TMP would include proposed work hours and traffic mitigation measures (id.). The Company anticipated no impacts to the Danvers River as a result of construction on the Veterans Memorial Bridge (id.).

7. Existing Cable Removal

As mentioned above, the Existing Cable is filled with dielectric fluid. See Section III.B.1, supra. To meet the requirements of the Massachusetts Contingency Plan ("MCP") and limit the potential for future dielectric fluid releases, the Company would remove the land and submarine portions of the Existing Cable from its current location rather than retire it in place (Exh. NG-2, at 121).[46,47]

a. Land-Based Cable Removal

Before removing the Existing Cable, NEP would use compressed air to purge the cable core of its dielectric fluid (Exhs. NG-2, at 121; EFSB-W-12; Tr. 2, at 284-290). The Company would arrange for off-site trucking and disposal of dielectric fluid removed in this process, as well as fluid drained from fluid reservoirs, cable terminations, and other auxiliary equipment (Exh. NG-2, at 123). After draining the cable core, the Company would remove the Existing

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46 In addition, leaving the submarine portion of the Existing Cable in place in the Danvers River might complicate future dredging projects (Exhs. NG-2, at 124; EFSB-CM-16). Removing the Existing Cable from the MBTA ROW would eliminate MBTA work restrictions that now apply there (Exhs. NG-2, at 123; Tr. 1, at 57-58).

47 NEP noted that, even after purging dielectric fluid from the Existing Cable, leaving the cable in place would still constitute a "threat of release" as defined in the MCP (Exhs. NG-2, at 121, 123, 124; EFSB-CM-16). See 310 CMR 40.

Cable using an excavator except where conditions require vacuum excavation or hand tools to avoid disturbance to existing utility lines and service connections (id.). The Company anticipated temporarily stockpiling excavated soils for use as backfill during restoration (id.). The Company would manage soils excavated from areas of known contamination in accordance with the Utility-Related Abatement Measure ("URAM") or Release Abatement Measure ("RAM") provisions of 310 CMR 40, the MCP (id.).

NEP would endeavor to maintain access to homes and businesses along affected streets during trenching and other cable removal activities (Exh. NG-2, at 123). Depending on field conditions, the Company anticipated that cable removal would progress at 100 to 400 feet per day, with cable removal taking two to five days at any one structure (id.). NEP stated that paved surfaces disturbed during the Existing Cable removal would be temporarily patched and subsequently restored to pre-construction conditions, with final pavement restoration as described above in Section VI.C.5 (id.).

Along the MBTA ROW, the Company would schedule cable removal in coordination with the MBTA and the City of Beverly (Exh. NG-2, at 123, 128). At the behest of the MBTA, the Existing Cable removal would likely take place during nights and weekends, between the hours of 1:00 a.m. and 5:00 a.m. (id.). NEP reported that, for railroad safety, the MBTA would require flaggers at each end of the excavation trench, and night work would require lighting (id. at 123; Tr. 1, at 118-120). The MBTA is likely to require track monitoring to detect any shifting of track geometry during excavation activities (Exh. NG-2, at 123).

b. Submarine Cable Removal

The process of removing fluid from the submarine cable would proceed in the same manner as for the land cable (Exh. NG-2, at 124; Tr. 2, at 290). First, the stop-joint on Congress Street, which joins the submarine and land portions, would be excavated, removed, and the cable ends capped (Exh. NG-2, at 124). The submarine portion of the Existing Cable would be excavated starting at the landfalls: the North River #30 Terminal in Salem and the landfall on Congress Street in Beverly (id. at 122, 124).

Within the Danvers River, NEP would use a barge-mounted excavator to lift the Existing Cable onto the barge (Exh. NG-2, at 124). The Company would either cut the cable into 40- to 50-foot sections or wind it onto a cable reel (id.). NEP would collect the cables for off-site recycling and/or disposal (id. at 123-124). NEP might use hand-jetting equipment to expose the submarine cable before hoisting it onto the barge (id. at 124). While the Company does not anticipate dredging, NEP included it as a contingency in its Chapter 91 permit application for the submarine cable removal, see Section VI.D.2.a.i (Tr. 2, at 295-296). Submarine cable removal is expected to take approximately four days (Exh. NG-2, at 124). During this time, the Company would coordinate with the harbormasters of Beverly and Salem, as well as with the U.S. Coast Guard, to limit impacts to boat traffic (id.; Exhs. EFSB-T-16; EFSB-T-18).

c. North River #30 Terminal Work

At the North River #30 Terminal, NEP would remove certain equipment no longer necessary to support the Existing Cable including: four riser termination structures, fluid reservoirs and associated foundations; two wood poles; one battery cabinet and foundation; two cabinets mounted on an existing transmission structure; and a circuit switcher (Exh. NG-2, at 124-125).

8. General Construction Scheduling

Construction of the New Cable and related substation work would take place over approximately 18 months; removing the Existing Cable would take place over approximately 12 months (Exh. NG-2, at 6-7). NEP would develop Project construction hours in consultation with the Cities of Beverly and Salem, MassDOT, and the MBTA (id. at 88; Tr. 1, at 118-120). In the Beverly MOA, NEP committed to construction work hours of 7:00 a.m. to 4:30 p.m. on weekdays; the Beverly MOA indicates that the Company would only work on weekends for certain time-sensitive activities and that, if necessary, work would not start work before 8:00 a.m. (Exh. EFSB-CM-15(S2)(1) at 6). In the Salem MOA, NEP committed to construction work hours of 8:00 a.m. to 5:00 p.m. on weekdays, exclusive of Saturdays, Sundays, and holidays (Exh. EFSB-CM-15(S1)(1) at 5). Both MOAs acknowledge the potential need for completing

time sensitive work outside of normal work hours and describe processes by which the Company may request a waiver from the City (Exhs. EFSB-CM-15(S2)(1) at 6; EFSB-CM-15(S1)(1) at 5). Additionally, both MOAs acknowledge that work hours for certain construction activities may be subject to approval from another jurisdictional agency (e.g., MassDOT, MBTA) (Exhs. EFSB-CM-15(S2)(1) at 6; Exh. EFSB-CM-15(S1)(1) at 5). NEP indicated that its construction work hours are consistent with each municipalities noise ordinance (Exh. NG-2, at 88).[48]

According to the Company, certain activities may require extended workdays or work outside normal construction hours, including night work (Exh. NG-2, at 88). These activities may include: cable splicing; trenchless crossing operations; construction of the manhole and duct bank system along Pleasant Street underneath the MBTA railroad bridge; and any night work requested by Salem, Beverly, or state or federal agencies (id.). Submarine cable removal would likely occur during extended hour workdays, with no night work anticipated (id. at 124). North River #30 Terminal work would occur during the normal work hours for Salem (id. at 125).

D. Environmental Impacts

1. Land Use and Historic Resources

a. Company Description

i. Land Uses along the Primary and Noticed Alternative Routes

The Company described abutting land uses along both the Primary and Noticed Alternative Routes as primarily residential (Exh. NG-2, at 91). NEP noted that both routes would traverse Wellman Street, which has an especially high density of multifamily units (id.). For the Primary Route, Broadway Street is an especially dense residential segment of the route; Lothrop Street is marked by more single-family homes (id.). NEP reported that the highest

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[48] In addition to noise ordinances, NEP indicated it would observe any work moratoria maintained by the Cities of Salem and Beverly, including, for example, Salem's winter construction moratorium which is in effect from December through April (Exh. EFSB-CM-2). Nevertheless, the Company believes that Salem would allow it to open streets to support construction during those months as necessary (id.). Beverly does not have a winter construction moratorium (id.).

densities of residential land use along the Noticed Alternative Route are along Roundy Street, Charnock Street and the southern portion of Essex Street (id. at 94). The Primary Route turns east from Park Street at Broadway, heading towards downtown Beverly and passing an area that includes multi-family development, Beverly City Hall, Monument Square, and the Beverly Fire Department; by continuing along Park Street to Roundy Street, the Noticed Alternative Route avoids the city center of Beverly (id. at 61-63, 76).

Commercial and industrial land uses are found primarily along roadway segments common to both routes; specifically, Waite Street and Pierce Avenue in Salem, and Park Street and Cabot Street in Beverly (Exh. NG-2, at 91, 94). Table 4, below, summarizes the Company's identification of land uses for the Primary and Noticed Alternative Routes; percentages represent the proportion of land use categories along each route (id. at 90).[49]

The Company stated that the Primary Route would pass 19 more residential units than the Noticed Alternative Route (Exh. NG-2, at 94). On the other hand, the Noticed Alternative Route, which is 0.4 miles longer, would pass a greater area of residential land use (id.). The Primary Route would pass 45 fewer commercial/industrial properties than the Noticed Alternative Route (id.). The Company reported eleven sensitive receptors along the Primary Route and five sensitive receptors along the Noticed Alternative Route (id. at 90).[50,51] Additionally, construction of the Primary Route would affect less open space than the Noticed

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49 NEP calculated the percentages for each land use using a 100-foot-wide route corridor centered on the middle of each street (Exh. NG-2, at 90).

50 The Company described as sensitive receptors land uses which are more susceptible to potential Project impacts and may require additional of possible mitigation (Exh. NG-2, at 91 n.19). NEP's identified sensitive receptors including parkland, hospitals, schools, day care facilities, elderly housing and convalescent facilities, fire stations, funeral homes, police stations, and churches (id.).

51 Three sensitive receptors are common to both routes (the Sally Milligan Nature Reserve and Odell Veterans Memorial Park) (Exh. NG-2, at 94). The Primary Route also passes Beverly City Hall, Beverly Fire Department, Beverly Common, the Central Cemetery, Kimball Haskell Park, Harborlight House (an assisted living facility), Saint Peter's Church, and the Christian Science Society (Exh. NG-2, at 91). Sensitive receptors along the Noticed Alternative Route include Odell Veterans Memorial Park, Hurd Stadium, and the U.S. TaeKwondo Center Afterschool Center (id. at 91).

Alternative Route (id. at 90-95). NEP promised to minimize any temporary effects to sensitive receptors along either route during construction activities (id. at 94).

Table 4. Land Use, Primary and Noticed Alternative Routes

Use Classification	Primary Route	Noticed Alternative Route
Residential Units (% of route)	519 (71%)	500 (68%)
Commercial/Industrial Units (% of route)	27 (18%)	72 (23%)
Mixed Use (% of route)	1%	1%
Open Space (% of route)	10%	7%
Sensitive Receptors	11	5

Source: Exh. NG-2, at 90-91

The Company stated that construction of the New Cable would not have any long-term impacts to land uses or to open spaces, regardless of which route is chosen, because all proposed facilities would be located underground within existing streets or substations (Exh. NG-2, at 94). Furthermore, impacts to adjacent land uses would be temporary (i.e., limited to the duration of construction) (id.). NEP would minimize construction period impacts to adjacent land uses by implementing detailed construction management plans related to traffic control, erosion and sediment control, and noise mitigation (id. at 95).[52] The Project contractor would complete pre-construction video surveys of structures and other features along the Project construction route to the extent allowed by landowners (id.).

The Company concluded that the Primary Route would be superior to the Noticed Alternative Route, because, as the shorter of the two routes, Primary Route would have a smaller area of impact (Company Brief at 72-73, citing Exh. NG-2, at 95).

ii. Land Use Along the Existing Cable

Land uses along the in-street portion of the Existing Cable path are primarily residential along Congress Street, Wellman Street, and Webber Avenue in Beverly (Exh. NG-2, at 127). Land uses along River Street through McPherson Drive are predominately commercial and

[52] Impacts and specific mitigation related to wetlands and water resources, noise, and traffic are described in Sections VI.D.2, VI.D.3, and VI.D.7, respectively.

industrial (id.). Innocenti Park is to the west along McPherson Drive just before the cable enters the MBTA ROW (id.).[53] Mixed residential uses (single and multi-family homes) predominate adjacent to the North River #30 Terminal and at the submarine cable landing on Congress Street in Beverly (id.).

iii. Substation Land Use

NEP represented that the East Beverly #51 Substation is in an area generally characterized by low-density residential land use (Exh. NG-2, at 115). An aerial photograph and map overlay provided by the Company displays the East Beverly #51 Substation set back from Cross Lane by about 400 feet and surrounded by forested land on all sides (id., app. 5-2, at 8). The proposed upgrades to the East Beverly #51 Substation and to the Beverly #12 Substation would be within the footprint of existing substation yards; they would involve no long-term impacts to surrounding land uses (Exh. NG-2, at 111, 115).

Regardless of the route chosen, proposed upgrades to the Beverly #12 Substation would involve expansion of the northwest corner of the inner substation fencing by 20 feet to the north and 25 feet to the west in the existing yard to accommodate new equipment (Exh. NG-2, at 111). The expansion would occur inside the limits of Company-owned property currently used for parking and equipment storage without affecting existing or surrounding land uses (id.). The Beverly #12 Substation provides public waterfront access via a walkway and viewing platform (id.). The Project would not impede access to that walkway; therefore, the Company does not expect any public waterfront impacts (id.).

The proposed Waite Street Switching Station, in Salem, would be located on a vacant, Company-owned parcel adjacent to industrial and commercial properties; the nearest residence is approximately 300 feet away (Exh. NG-2, at 118). NEP maintains that, although construction of the Waite Street Switching Station would constitute a permanent land use change, it would not

[53] Construction is not likely to affect parking and pedestrian access to Innocenti Park, which is not located along the path of the existing cable (Exh. NG-2, at 127).

result in any long-term impacts to surrounded land sues, given the industrial and commercial nature of the nearby properties (Company Brief at 85, citing Exh. NG-2, at 118).[54]

iv. Shade Trees

There are approximately 178 public shade trees along the Broadway Street and Lothrop Street segments of the Primary Route and 125 public shade trees along the Roundy Street, Charnock Street, Pearl Street, and Lake Shore Avenue segments of the Noticed Alternative Route (Exh. NG-2, at 95).[55] Regardless of the route, NEP stated that it does not anticipate removing any trees to facilitate construction but would conduct a final assessment in consultation with the tree wardens of Salem and Beverly (id.). The Company committed to complying with tree protection ordinances of Beverly and Salem and implementing BMPs to protect public shade trees from temporary construction impacts (e.g., temporary fencing) (id.). The Company indicated that, due to the larger number of public shade trees along the Primary Route, there is a higher potential for unanticipated/accidental impacts during construction along that route; therefore, the Company considered the Noticed Alternative Route preferrable with respect to potential Project impacts on public shade trees (Company Brief at 73, citing Exh. NG-2, at 95). The Company indicated that removing the Existing Cable would not result in removal of any public shade trees (Exh. NG-2, app. 6-1, ENF Form).

v. Rare/Endangered Species and Priority Habitat

The Company represented that there are no rare species habitats, or Areas of Critical Environmental Concern along the Primary and Noticed Alternative Routes (Exh. NG-2, at 66). The Company also indicated no Natural Heritage and Endangered Species Program Priority or Estimated Habitat at the existing Beverly #12 and East Beverly #51 Substations, or at the proposed Waite Street Switching Station (id. at 110). The Company indicated that removal of

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54 NEP stated that it would construct a sidewalk along Ferry Street where it passes the new switching station at the request of the City of Salem (Exh. NG-2, at 118).

55 The Company stated that G.L. c. 87 defined public shade trees as all trees within a public way or on the boundaries thereof (Exh. NG-2, at 95).

the Existing Cable would not take place within any Areas of Critical Environmental Concern or habitats for rare species (id., app. 6-1, ENF Form).

vi. Historic, Cultural, and Archeological Resources

The Company stated that because the Project does not involve demolishing or alternative any buildings it is not expected to adversely impact any historical resources (Exh. NG-2, app. 6-1, A-20). Both the Primary and the Noticed Alternative Routes would be located adjacent to multiple properties and other resources documented by the Massachusetts Historical Commission ("MHC") in the MHC's Inventory of Historic and Archaeological Assets of the Commonwealth (id. at 104). These resources include: Individually Inventoried Buildings, Inventoried Areas, Local Historic Districts, and buildings and districts listed on, or eligible for, the National Register of Historic Properties ("National Register") (id.).

The Company reported 241 individually inventoried historical properties along the Primary Route (Exh. NG-2, at 105). There are also several pre- and post-contact archaeological sites along the Primary Route (id.). The Noticed Alternative Route, in contrast, would traverse approximately 171 inventoried properties, including buildings, listed as historical resources, and five archaeological sites (id.).

The Beverly #12 Substation is within an MHC inventoried site named for the Beverly Gas and Electric Company (Exh. NG-2, at 113). A portion of the MHC site overlaps a National Register-listed historic district that includes the Beverly Gas and Electric Company Building 1, located immediately north of the substation (id.). The proposed scope of improvements at the Beverly #12 Substation would not involve alteration of any existing buildings (id.).

The East Beverly #51 Substation intersects a pre-contact archaeological site known as Paradise Crossing (Exh. NG-2, at 116). The Company expects no Project-related adverse impacts to historical or archaeological resources at this location due to the previously disturbed nature of the substation (id.).

The proposed Waite Street Switching Station is not within any previously identified historic districts or archaeological sites, nor is it located adjacent to any inventoried historical

resources; therefore, the Company expects no impacts to historical or archaeological resources as a result of activities related to Project construction (Exh. NG-2, at 119).[56]

Because the Project would primarily be located underground within existing roads and substations, the Company anticipated no impacts from construction to historical and archaeological resources along either route (Exh. NG-2, at 105). Furthermore, Project construction should not harm any resource listed in the State Register of Historic Places or in MHC's inventory (id., app. 6-1, att. A at A-16). The Company stated that it would provide to MHC a detailed archeological sensitivity assessment and recommendations for further archaeological testing (id.). In addition, the Company would both continue consulting with MHC concerning potential impacts to state-listed historic and archaeological assets as well as work with MHC as part of the Section 106 consultation process led by the U.S. Army Corps of Engineers ("USACE") (id., app. 6-1, att. A at A-22).

With respect to removing the Existing Cable from the Danvers River, NEP submitted cultural resource reports to the Massachusetts Board of Underwater Archeological Resources ("MBUAR") and the MHC (Exh. NG-2, app. 6-1, att. A at A-16). The MBUAR indicated that it uncovered no record of any underwater archaeological resources as part of its preliminary review of files and sources, and that, although the Danvers River might be considered an archeologically sensitive area, the river crossing might already be extensively disturbed and therefore removal of the Existing Cable would be "unlikely to affect submerged cultural resources" (id.). However, the Board recommended development of procedures for dealing with unanticipated finds encountered during construction of the Project due to the potential sensitivity of the area (id., app. 6-1, att. A at A-16 to A-17).

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[56] NEP will, however, develop and implement procedures for unanticipated finds encountered during the construction phase of the Project, as well as conduct an archeological reconnaissance survey for the Project (Exh. NG-2, at 119). The survey will include a review of information on existing utilities, soil borings, and geotechnical data (Exh. NG-2, at 119).

b. Analysis and Findings on Land Use and Historic Resources

The Company identified the number of residential units, commercial/industrial units, and sensitive receptors along the Primary and Noticed Alternative Routes. The Primary and Noticed Alternative Routes have similar land uses, but the Noticed Alternative Route is slightly longer. The Primary and the Noticed Alternative Routes would pass a similar number of residential units. There are more commercial and industrial units along the Noticed Alternative Route, but a greater number of sensitive receptors along the Primary Route. With respect to other aspects of land use, impacts to public shade trees and open space/parkland would be similarly minimal along the two routes; along either route, the impacts anticipated would be construction-related and temporary.

With the exception of the Veterans Memorial Bridge crossing, NEP would install the New Cable underground along the Primary or Noticed Alternative Route, within existing roadways. The record shows that, because NEP proposes to construct the New Cable underground, land use impacts would be limited to the duration of construction. To minimize damage to nearby properties, NEP is requiring its contractor to document the pre-construction condition of structures and other route features. Along either route, the Company's construction plans would mitigate impacts to adjacent land uses.

With either the Primary Route or the Noticed Alternative Route, the Project would be constructed at previously disturbed in-street and underground locations, and at three Company-owned parcels, two of which are already sites for NEP substation facilities. The land use impacts of the New Cable installation would, therefore, be primarily construction-related and, for the most part, temporary.

For either route, the Project would require a new switching station in Salem and the same upgrades to the Beverly #12 and East Beverly #51 Substations. Therefore, substation-related land use impacts would be the same for the Primary and Noticed Alternative Routes. The record shows that NEP would construct the Waite Street Switching Station on a vacant, Company-owned parcel predominately surrounded by existing industrial and commercial land uses. The Waite Street Switching Station would be consistent with existing land uses, while the Beverly #12 and East Beverly #51 Substation upgrades would not result in a significant change of land

use at either location. Furthermore, removing the Existing Cable would not result in any change to existing land use along its alignment.

There is greater potential to impact historical and archeological resources along the Primary Route than the Noticed Alternative Route, but no impacts are anticipated given that either route goes through previously disturbed property owned by the Company (i.e., the Company's substation parcels) and beneath existing streets. Furthermore, NEP has pledged that it will continue to work with USACE, MBUAR, and MHC as needed to avoid affecting historical and archeological resources of the Project and to complete the Section 106 process. No rare species habitats or Areas of Critical Environmental Concern are along either the Primary or the Noticed Alternative Route, or along the route of the Existing Cable.

Although the Noticed Alternative Route passes fewer historical and archeological resources, the Project construction will take place almost entirely in streets where any impacts should be minimal and temporary. The Primary Route and Noticed Alternative Route have broadly similar land use characteristics. Given the number of residential units, commercial and industrial units, and sensitive receptors along either route, construction would have impacts of a similar magnitude on adjacent land uses. The Siting Board directs the Company to develop a comprehensive outreach plan for the Project in consultation with the Cities of Salem and Beverly, and submit it to the Siting Board for review prior to the start of construction. The outreach plan shall describe the procedures to be used to notify the public about: (1) the scheduled start, duration, and hours of construction in particular areas; (2) the methods of construction that will be used in particular areas (including any use of nighttime construction); and (3) anticipated street closures and detours. The outreach plan shall use plain language, include detailed maps, and shall also include information on complaint and response procedures; Project contact information; the availability of web-based project information; and protocols for notifying the schools of upcoming construction. The Company shall translate the outreach plan into appropriate languages, as necessary for the Project area.

On balance, the Siting Board finds that the Primary Route and the Noticed Alternative Route are comparable with respect to land use and historical resource impacts, and that such impacts of the Project along the Primary Route would be minimized.

2. Water and Wetlands

a. Company Description

i. Wetland Resource Areas

The Company initially assessed the potential for Project-related impacts to wetland resource areas along the Primary and Noticed Alternative Routes by reviewing existing federal and state information, including wetland-related data layers available in MassGIS (Exh. NG-2, app. 6-1, at A-23). Although the New Cable would be installed underground within existing roadways along either route, NEP reported that both routes intersect the following resource areas subject to the Massachusetts Wetlands Protection Act ("MassWPA"): 200-foot Riverfront Area, and Land Subject to Coastal Storm Flowage ("LSCSF") (id. at 108). NEP noted that, although it identified Bordering Vegetated Wetlands ("BVW") in the vicinity of both routes, Project construction would occur only within the 100-foot Buffer Zone to BVW (id., app. 6-1, at A-25).

The Company reported that the Primary Route intersects resource areas in ten instances and that the Noticed Alternative Route intersects resource areas in eight instances; all but two of the resource areas are common to both routes (Exh. NG-2, at 108, app. 5-2, Env. Resource Maps, at 5-6).[57,58] The two additional resource areas along the Primary Route are associated with culverted streams which pass beneath Lothrop Street (Exh. NG-2, at 108-109). Given that construction would occur within the limits of paved roadways, the Company does not anticipate impacts to undisturbed riverfront area (id.). NEP maintains that, because there would be no

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[57] A potential vernal pool is located within approximately 100 feet of Boyles Street near the East Beverly #51 Substation; Boyles Street is common to both the Primary and Noticed Alternative Routes (Exh. NG-2, at 109, 116, and app. 5-2, Env. Resource Maps, at 8). NEP reiterated that construction would be confined to the existing roadway at this location (id. at 109).

[58] The Company represented that there are no drinking water supply districts, surface water protection areas, or wellhead protection areas along the Primary and Noticed Alternative Routes (Exh. NG 2, at 66). The Company also indicated no surface water supply or wellhead protection areas near either the existing Beverly #12 and East Beverly #51 Substations or the proposed Waite Street Switching Station (id. at 110).

direct impacts to wetlands or water bodies as a result of installing the New Cable along either route, the Primary and Noticed Alternative Routes are equivalent (Company Brief at 77).

Given that both the Primary and Noticed Alternative Route would be constructed within public roadways and previously disturbed areas, NEP focused on the Primary Route and common elements of the Project when providing a more detailed assessment of the potential resource area impacts (Exh. NG-2, app. 6-1, at A-23 to A-31). Portions of the Beverly #12 Substation and the entire parcel at the proposed Waite Street Switching Station are within LSCSF; part of the Waite Street Switching Station is also within the 100-foot buffer zone to a BVW (Exh. NG-2, at 112, 119). Part the East Beverly #51 Substation is located within 200-foot Riverfront Area and 100-foot buffer zone to BVW (id. at 116). NEP noted that construction of the Waite Street Switching Station and work at both substations would occur entirely within previously distributed areas (id., at figs. 5-7, 5-8, 5-9). NEP stated that removing the Existing Cable would result in temporary, construction period impacts to the following resource areas: Land Under Ocean, Coastal Bank, Coastal Beach, Tidal Flat, Land Subject to Coastal Flooding, and Riverfront Area (id. at 108, app. 6-1, at A-26). The Company noted several mapped Bordering Vegetated Wetlands ("BVW") in proximity to the MBTA ROW portion of the Existing Cable; however, cable removal activities would only occur within buffer zones to BVW with not direct or permanent impacts to those resource areas (Exh. EFSB-W-16(S2), at 24).

Pursuant to the Massachusetts Wetlands Protection Act, NEP submitted Notices of Intent to the conservation commissions of Salem and Beverly for Project work along the Primary Route that would occur within wetlands, waterways, and tidelands (Exh. EFSB-W-8). NEP received an Order of Conditions from the Beverly Conservation Commission on May 11, 2020, and an Order of Conditions from the Salem Conservation Commission on June 16, 2020 (Exh. EFSB-W-16(S1); EFSB-W-16(S1)(1); EFSB-W-16(S2)(1)). Additionally, NEP stated that it would obtain a National Pollutant Discharge Elimination System ("NPDES") Construction General Permit and maintain a Stormwater Pollution Prevention Plan ("SWPPP") on site (Exhs. NG-2, at 83; EFSB-W-6). Compliance with the Project's SWPPP would help ensure that erosion control measures are maintained throughout the construction period (Exh. NG-2, at 83).

NEP stated that construction within filled tidelands is subject to Chapter 91 jurisdiction,

including the following portions of the Project (along the Primary Route): 6.4 acres of the Beverly #12 Substation, 0.11 acres of the North River #30 Terminal, 703 linear feet along the Veterans Memorial Bridge to Cabot Street, 73.7 linear feet along Congress Street, and a small portion of land locked tidelands on Lothrop Street (Exh. NG-2, app. 6-1, at A-24, A-29 to A-30). NEP would coordinate with the MassDEP Waterways Department to obtain Chapter 91 permits and/or minor project modifications for work proposed within areas subject to waterways jurisdiction (id., app. 6-1, att. A at A-24). The Company stated that removal of the Existing Cable at the North River #30 Terminal in Salem and along Congress Street in Beverly would require written notice to MassDEP in accordance with 310 CMR 9.27; the Company anticipates pulling (not dredging) the existing direct-buried cable from the Danvers River (id., app. 6-1, at A-30).[59]

NEP outlined several strategies aimed at minimizing and mitigating potential wetland resource area impacts that could occur as a result of Project construction (Exh. NG-2, app. 6-1, att. A at A-26 to A-27). As a general matter, NEP would retain an environmental inspector charged with monitoring and ensuring compliance with all federal, state, and local permit requirements as well as Company policies (id., app. 6-1, att. A at A-27).[60] To reduce the likelihood of adverse impacts to resource areas, NEP and its contractors would follow the Company's construction BMPs (id., app. 6-1, att. A at A-27; EFSB-W-7). The Company would install appropriate erosion and sedimentation controls in accordance with permit conditions and the Company's above mentioned BMPs (Exhs. NG-2, app. 6-1, at A-27; EFSB-W-7).

As previously noted, removing the existing cable from the Danvers River would result in temporary impacts to the associated wetland resource areas (Exh. NG-2, app. 6-1, at A-25). NEP

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59 If cable pulling is unsuccessful, the Company would undertake minor dredging to dislodge the Existing Cable (Exh. NG-2, app. 6-1, att. A at A-30). Therefore, the Company plans to apply for a Chapter 91 permit for dredging activities as a contingency (id.). Such dredging, the Company represented, would likely result in more than 5,000 square feet of impact to Land Under Oceans, and such an impact would require the Company to file for an Individual Water Quality Certification with MassDEP (id.).

60 The construction contractor would assume the responsibility for daily inspection and compliance with permit requirements and Company policies (Exh. NG-2, app. 6-1, att. A at A-27).

stated it would develop and implement a Water Quality Monitoring Plan including provisions for: turbidity monitoring; dissolved oxygen monitoring; siltation curtains; restricting work to tidal stages that minimize the potential for suspended sediment transport; and adjusting the pace of work to allow restoration of water quality (id., app. 6-1, at A-27 to A-28). Additionally, NEP would conduct sediment characterization to identify appropriate measures for handling and disposal (id.). After removing the Existing Cable from the Danvers River, NEP would restore construction period impacts to Tidal Flat, Coastal Bank, Coastal Beach resources areas (id.).

The Company stated that, in the event of construction dewatering, a qualified individual would oversee compliance with applicable regulations, permit conditions, and Company policies (Exhs. EFSB-W-1; EFSB-S-4). When dewatering uncontaminated groundwater, NEP would direct the effluent to an infiltration basin, ground surface, open trench, or excavation (Exhs. EFSB-W-1; EFSB-S-4). Discharge would not occur directly into wetlands, streams/rivers, other sensitive resource areas, catch basins, or other stormwater devices unless specifically permitted (Exhs. EFSB-W-1; EFSB-S-4).[61] In the event that contaminated groundwater is observed, the NEP would notify its environmental consultant and manage the groundwater in accordance with the Massachusetts Contingency Plan (Exh. EFSB-W-1).

The Project is designed to avoid or minimize adverse wetland impacts to the extent feasible (Exh. NG-2, app. 6-1, att. A at A-25). According to the Company, with the implementation of BMPs, disturbance to previously undisturbed portions of wetland resource areas would be negligible (id.; Exh. EFSB-W-7). Furthermore, the Company represented that the majority of Project wetland impacts would result from removal of the Existing Cable, and these impacts are primarily attributable to the location of the Existing Cable within the Danvers River (Exh. NG-2, app. 6-1, att. A at A-25). NEP stated it would restore or mitigate disturbed areas, as appropriate and that, because the New Cable would be attached under the Veteran's Memorial Bridge, NEP would avoid future disturbance to the Danvers River (id.).

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61 NEP specifically noted that, if dewatering is necessary in the vicinity of the above-mentioned vernal pool, it would direct the discharge to the opposite side of the roadway or as far away as feasible (Exhs. EFSB-W-1; EFSB-W-3). The Company anticipated that groundwater table drawdown would be minimal and localized to the area of construction, without impact on the vernal pool (Exh. EFSB-W-1).

ii. Sea Level Rise

The Company assessed the Beverly #12 Substation for potential impacts related to sea level rise and coastal storm inundation due to its coastal proximity (Exh. NG-2, at 111). NEP stated that existing grades of the Beverly #12 Substation range from 9.5 feet, adjacent to the coastline, to 12.0 feet, near River Street; the Base Flood Elevation ("BFE") (i.e., the FEMA 100-year flood elevation) for the location is 10.0 feet NAVD88 and the FEMA 500-year flood elevation is 12.0 feet NAVD88 (Exh. EFSB-W-14). Therefore, the site is vulnerable to flooding under existing conditions (id.). To prevent inundation of equipment at the Beverly #12 Substation by rising sea levels, the Company would install new electrical equipment at the substation at least two to three feet above BFE, as recommended by ISO-New England ("ISO-NE") for coastal substations (id.; Exhs. NG-2, at 111).[62]

NEP stated that, according to the Boston Harbor Flood Risk Model, 0.62 feet of sea level rise is projected through the year 2030 (Exh. EFSB-W-14). The Company attested that its proposed design would adequately protect critical substation equipment from inundation through the year 2030 (Company Brief at 8, citing Exhs. NG-2, at 111, EFSB-W-14)). In conjunction with the above proposed design measures, NEP intends to retrofit facilities at the substation with flood protection measures such as Floodstop™ modular barriers, sump pumps, yard drains, and portable generators, as appropriate, to address flood hazards related to current 100-year flood elevations (Exh. EFSB-W-14). NEP stated that, in addition to the Company's proposed flood mitigation strategies, the use of more robust options such as substation hardening (e.g., flood walls or raising equipment) may be required (id.).

The Company stated that the design life of the new equipment it plans to install at the Beverly #12 Substation is approximately 40 years and acknowledged that more significant climate resilient measures for the entire substation might be necessary after 2030

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62 NEP would: (1) install control cabinets for outdoor equipment at least three feet above BFE; (2) install new equipment within the control house at least two feet above BFE; and (3) raise the existing DC panel and the relay and control panel terminal blocks at least two feet above BFE (Exh. NG-2, at 111).

(Exh. EFSB-W-14; Tr. 2, at 325). Consequently, the Company is developing an adaptation plan that would account for anticipated future conditions relative to sea level rise (Exh. EFSB-W-14). This approach, the Company asserts, would position the Substation to best comply with planning and implementation requirements and to incrementally adapt to sea level change (id.).[63] NEP also stated it intends to use best available data to incrementally apply flood mitigation strategies that build resilience into the system as better climate data is obtained and integrated into predictive coastal storm models (id.).

NEP conducted a similar analysis of potential impacts associated with sea level rise and coastal storm inundation for the Waite Street Switching Station (Exh. NG-2, at 118). NEP reported that the existing site grade at the Waite Street Switching Station is approximately 8.5 feet and that the BFE (i.e., the FEMA 100-year flood elevation) is also 10.0 feet (Exh. EFSB-W-13; RR-EFSB-4). To prevent inundation of the equipment from rising sea levels, NEP stated that the control house floor would be installed at 14.5 feet, which is approximately six feet above grade and more than three feet above the site's BFE (Exh. NG-2, at 118; RR-EFSB-3).

The Company explained that the East Beverly #51 Substation is adjacent to Curtis Brook, but above the 100-year (one percent annual probability) floodplain (Exh. EFSB-W-13).[64]

b. Analysis and Findings on Water and Wetlands

The record shows that construction of the New Line would intersect with jurisdictional wetlands resources areas including LSCSF and 200-foot Riverfront Area along either the Primary or Noticed Alternative Route; construction of the Primary Route would intersect two more resource areas compared to the Noticed Alterative Route. Both routes travel along Boyles Street near a potential vernal pool located within a wetland adjacent to the west side of the roadway. All work would be within the existing roadway layouts and the Company anticipates no temporary or permanent impacts to the identified wetland resource areas. The Project does

63 NEP acknowledged that robust options, such as flood walls or raising equipment to high elevations, may be required in the future (Exh. EFSB-W-14).

64 NEP reported that the Curtis Brook 100-year floodplain has a BFE of 47.3 feet, whereas the existing site elevations at the East Beverly #51 Substation range between 53 and 54 feet (Exh. EFSB-W-18).

not require filling or clearing within vegetated wetlands. Along either route, NEP would install the New Cable underground and within the limits of existing roadways. Consequently, new and/or permanent impact to undisturbed wetland resource areas is unlikely.

The record shows that portions of the Beverly #12 Substation and the entire parcel at the proposed Waite Street Switching Station are within LSCSF and part of the East Beverly #51 Substation is located within a 200-foot Riverfront Area. Substation improvements would occur within previously disturbed, Company-owned land at the Beverly #12 Substation and, at the East Beverly #51 Substation, would occur within the existing fence line.

The record shows that most Project wetland impacts would stem from removing the Existing Cable from the Danvers River. This removal and the associated temporary impacts would take place regardless of the location of the Project along the Primary or the Noticed Alternative Route. The Company plans to pull rather than dredge the existing submarine cable to minimize impacts to the Danvers River. Installing the New Cable beneath the Veterans Memorial Bridge, instead of within the Danvers River, would prevent additional disturbance to the river crossing, after project completion. Regardless of whether the Primary or Noticed Alternative Route is chosen, NEP anticipates only temporary disturbance to filled tidelands in conjunction with removing the Existing Cable and installing the New Cable on the Veterans Memorial Bridge. The Company is applying for Chapter 91 permits as necessary and will comply with all such requirements.

NEP would carry out project construction in accordance with its own BMPs and a Project-specific SWPPP to address potential for erosion and sedimentation within wetland resource areas. Additionally, NEP will retain an environmental inspector to monitor work areas and help ensure that all construction conforms with permit conditions established for the Project. The Company will be required to comply with conditions included in the Orders of Condition issued by the Beverly and Salem Conservation Commissions.

The record shows that existing grades at the Beverly #12 Substation are between 9.5 and 12 feet; the BFE for the site is 10.0 feet NAVD88 and the 500-year flood elevation is 12 feet NAVD88. NEP proposed to install new electrical equipment for the Project at elevations two to three feet above BFE (i.e., at elevations of 12 to 13 feet), consistent with an ISO-NE-

recommended design guideline for coastal substations. The design life of the proposed equipment is approximately 40 years. At the Waite Street Switching Station NEP proposed to construct the control house floor about 4.5 feet above BFE (i.e., at an elevation of 14.5 feet); the East Beverly #51 Substation is not subject to flooding associated with Curtis Brook or to coastal inundation.

The locations of the Beverly #12 Substation and the Waite Street Switching Station require further consideration of the potential for adverse impacts from future sea level rise. In a previous case involving another coastal substation, the petitioner selected a design flood elevation in the context of a 500-year flood, a 40-year design life of equipment, and an expectation of three feet of sea level rise through the year 2070. See East Eagle at 58, 67. Following the same approach for the instant case is reasonable considering the exigencies of climate change and the risk of exposing new, critical electrical equipment to coastal inundation. Therefore, the Siting Board directs NEP to install new equipment at the Waite Street Switching Station at a minimum elevation of 15 feet NAVD88 (i.e., least three feet above the 500-year flood elevation). The Siting Board further directs NEP to install new equipment at the Beverly #12 Substation at a minimum elevation of 15 feet NAVD88 or implement equivalent flood resiliency measures, as further described below.

The record shows that NEP intends to protect facilities at the Beverly #12 Substation with additional measures (e.g., modular barriers, sump pumps, portable generators) to address existing flood hazards. Given the vulnerability of the Beverly #12 Substation, the Siting Board is requiring an incremental height increase for new electrical equipment or implementation of equivalent flood resiliency measures. Observing that the design life of new equipment installed at the Beverly #12 Substation is 40 years, the Siting Board notes the critical importance of NEP's longer term adaptation plan, which the Company is currently developing. The Siting Board anticipates that future resiliency improvements for sea level rise will be necessary within the design life of new equipment installed at the Beverly #12 Substation.

To address the above concerns, and given the pressing need for the New Cable, the Siting Board directs the Company to start construction on the New Cable, the Waite Street Switching Station, and upgrades to the East Beverly #51 Substation. The Siting Board also directs the

Company to undertake a feasibility/planning-level analysis ("Resiliency Analysis") that describes the environmental impacts, costs, and reliability of implementing measures that would achieve flood mitigation resilience outcomes equivalent to placing new equipment at an elevation of 15 feet NAVD88 (i.e., the 500-year flood plus three feet of sea level rise through the year 2070). The Resiliency Analysis shall consider and compare measures including, but not limited to: (1) raising new equipment proposed for the Beverly #12 Substation to an elevation of at least 15 feet NAVD88; and (2) other protective measures (e.g., levees, floodwalls, living shorelines) that would protect the entire Beverly #12 Substation. The Resiliency Analysis shall also assess the potential for any detrimental effects on parcels neighboring the Beverly #12 Substation as a result of flood protection measures proposed for the shoreline of the Bass River. NEP shall submit the Resiliency Analysis to the Board no later than 90 days prior to commencing construction at the Beverly #12 Substation. The Siting Board will expeditiously review the Resiliency Analysis. The Siting Board delegates final determination to the Chair as to whether any of the additional flood mitigation measures are necessary and appropriate and shall be implemented. This provision applies only to construction at or modification of the Beverly #12 Substation, exclusive of the New Cable and related structures.

The Siting Board recognizes that modeling and equipment to address the potential effects of sea level rise on the Project are constantly improving. Therefore, the Siting Board directs that the Company shall every five years from the date of operation review municipal, state, and federal projections, as applicable, of sea level rise and submit a report to the Siting Board analyzing the necessity, appropriateness, and cost of implementing additional flood mitigation measures at the Beverly #12 Substation and the Waite Street Switching Station to protect the facilities from inundation. In preparing each report the Company shall consult with agencies including, but not limited to, the Cities of Salem and Beverly, Office of Coastal Zone Management, Massachusetts Emergency Management Agency, and the Department of Environmental Protection. The Siting Board will review each report and determine whether any of the additional flood mitigation measures are necessary and appropriate and shall be implemented, provided that any mitigation measures shall not have any detrimental effects on neighboring parcels, at the Beverly #12 Substation or the Waite Street Switching Station.

The potential for wetland and water resource area impacts are slightly greater along the Primary Route compared to the Noticed Alternative Route. The Siting Board therefore finds that the Noticed Alternative Route is slightly preferable to the Primary Route with respect to wetland and water resources impacts. However, the wetland and water resource impacts for the Project along either route would be largely temporary. Furthermore, NEP plans to use a variety of mitigation measures, including BMPs for erosion and sediment controls, throughout construction. In addition, the Company will perform all work in and adjacent to resource areas in accordance with permit requirements. Based on the above, the Siting Board finds that the Company has properly minimized impacts to wetland and water resources.

3. Noise

a. Company Description

i. Construction Period Noise Impacts

Project construction would follow the sequence outlined in Section VI.C above, regardless of the route selected (Exh. NG-2, at 100). The potential for noise impacts during construction depends on the equipment used and hours of operation; greater utility density and/or shallow bedrock could increase the duration at a single location and may require louder equipment (Exh. NG-2, at 100).[65] NEP would use heavy machinery at various times throughout the Project construction (Exh. EFSB-NO-3). As explained in Section VI.C.4, cable splicing would occur at manholes and would likely require extended work hours; during cable splicing, noise sources would include a portable generator and an air conditioner (Exh. NG-2, at 86). The Company anticipated that noise impacts associated with the Project would last through the construction period, about 18 months (id. at 98). Construction would only occur for discrete periods at any point along the route; various construction durations are summarized in Table 5, below.

[65] NEP reported that rock removal by excavator mounted hoe ram or drilling and hydraulic breaking would generate 85 to 90 A-weighted decibels ("dBA") at a distance of 50 feet; no blasting will occur to remove rock (Exh. NG-2, at 84; RR-EFSB-8).

Table 5. Estimated construction durations.

Construction Activity	Rate of Construction or Time Required
Trenching	40 to 100 feet per day
Manhole installation[1]	8 – 11 days
Cable pulling	4 – 6 days
Cable splicing	6 days

[1] The Primary Route would require twelve manholes; the Noticed Alternative Route would require thirteen manholes (Exh. EFSB-LU-6). Cable pulling and cable splicing only occur at manhole locations.

Source: Exhs. NG-2, at 84; EFSB-CM-5

The Company reported that construction along the Primary Route would encounter approximately 150 fewer linear feet of shallow bedrock area, 16 fewer subsurface utility crossings, and fewer route bends compared to the Noticed Alternative Route (Exh. NG-2, at 100). In addition, the Primary Route would require less time to construct because it is 0.4 miles shorter than the Noticed Alternative Route (id.). The associated reduction in Project construction time would reduce the amount and duration of noise impacts (id.).

The Company indicated that noise levels at a specific location would decrease with distance from the source(s) of noise (Exh. NG-2, at 99-100). Table 6 summarizes the number of buildings within 25 and 50 feet of the Primary and Noticed Alternative Routes.

Table 6. Buildings within 25 & 50 Feet of the Primary and Noticed Alternative Routes

Route	Primary Route	Noticed Alternative Route
Buildings ≤25 feet	25	68
Buildings >25 & ≤50	181	250

Source: Exh. NG-2, at 100.

While most construction would occur during typical daytime working hours, NEP stated that it might seek approval to work at night for some tasks in certain locations or at the request of the municipality or the MBTA (id. at 88-89; Exhs. EFSB-NO-2; EFSB-T-8).[66] The Company

[66] As stated in Section VI.C.8, construction hours would be Monday through Friday between 7:00 a.m. and 4:30 p.m., in Beverly, and Monday through Friday between 8:00 a.m. and 5:00 p.m., in Salem, consistent with each municipality's noise ordinance and the Company's MOA with each city (Exhs. NG-2, at 88; EFSB-CM-15(S1)(1) at 5; EFSB-CM-15(S1)(2) at 6).

committed to working with Beverly, Salem, and the MBTA, as appropriate, to limit noise impacts of extended work hours or night work (Exhs. NG-2, at 88; EFSB-T-8). During construction, NEP would comply with the work hours set forth in the Beverly MOA and Salem MOA and coordinate its construction activities with each municipality (Exhs. NG-2, at 99-101; EFSB-NO-1; EFSB-CM-15(S2)(1) at 6; EFSB-CM-15(S1)(1) at 5).

NEP stated that, due to a high density of existing utilities, it would use trenchless crossing construction techniques to install the New Cable where it exits the Beverly #12 Substation and crosses River Street at Pleasant Street (Exhs. NG-2, at 87; EFSB-LU-7; EFSB-LU-8). NEP stated it would complete the trenchless crossing using jack-and-bore techniques, which would last six to nine weeks and require use of specialized larger, noisier equipment than the digging equipment used for open-trench installation (Exhs. NG-2, at 87 to 88, 99-100; EFSB-NO-3).[67] The Company reported that there are no residential units within 100 feet of the jack-and-bore entry or exit pit locations (Exh. EFSB-LU-7). NEP noted that crossing River Street at Pleasant Street is required for either route and, therefore, the associated noise impacts would not constitute a differentiating factor (Exh. NG-2, at 100).

Work to remove the submarine portion of the Existing Cable will likely occur during the day over approximately four extended hour workdays, but no night work is anticipated (Exh. NG-2, at 124). Removal of the cables along the MBTA ROW would be constrained by MBTA scheduling and, as such, NEP indicated that night-work would likely be required for removal activities along the MBTA ROW, typically between the hours of 1:00 a.m. and 5:00 a.m., on weekdays and/or weekends at times when trains are not running (id. at 128). Activities to remove the land-based portion of the Existing Cable would take approximately two to five nights to complete at any particular business or residence (id. at 123). Noise generated during removal of the Existing Cable would range between 80 and 90 dBA at 50 feet without

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[67] Construction noise levels at stationary work sites that include jack-and-bore locations may be as high as 90 dBA at 50 feet (Exh. EFSB-NO-12).

noise buffering or other mitigation (id. at 99; Exh. EFSB-NO-2).[68] The Company characterized the MBTA ROW as screened from adjacent land uses (Exh. NG-2, at 127).

NEP represented it would minimize construction noise impacts by requiring well-maintained equipment with functioning mufflers; replacing louder pieces of equipment with quieter units; scheduling loud activities during regular work hours to the extent possible; using low-noise generators; and requiring strict compliance with the Massachusetts anti-idling regulations (Exhs. NG-2, at 101; EFSB-NO-3; EFSB-NO-6; EFSB-NO-7; EFSB-NO-12). Regarding night work for removing the Existing Cable from the MBTA ROW, NEP indicated it could use temporary portable noise barriers where appropriate (Exh. NG-2, at 128). NEP will use the Project website to alert abutters to pending work activities outside typical working hours, with updates on planned activities for the upcoming two weeks (Exh. EFSB-NO-2). The Company will also maintain a Project hotline for abutters to use to raise specific concerns or questions to a Stakeholder Representative for the duration of the Project (Exh. EFSB-NO-2). NEP also stated it would regularly update its website and provide email updates regarding any planned work outside typical working hours (id.; Exh. NG-2, at 99-101). NEP stated that it would consider noise mitigation such as portable noise barriers at locations with space to erect and leave barriers for the duration of the construction activity involved (Exhs. EFSB-NO-8; EFSB-NO-12; EFSB-NO-17).[69,70]

NEP expected only temporary noise impacts associated with construction of proposed upgrades at the Beverly #12 Substation, East Beverly #51 Substation, and the new Waite Street

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68 The Company indicated that, due to noise attenuation of structures, typical indoor noise levels from construction would range from 33 to 63 dBA during the winter (windows closed) and 43 to 73 dBA during the summer (windows open) (Exhs. EFSB-NO-9; EFSB-NO-10).

69 According to the Company, these communications arrangements would promote a well-informed public and help manage expectations relative to construction activity and potential noise impacts (Exh. NG-2, at 99-101).

70 The Company asserted that temporary noise barriers are not feasible for in-street construction areas (e.g., pavement cutting, duct bank installation) (Exh. EFSB-NO-8). The Company listed traffic congestion and restricted movement within the work zone, slowing construction, among the undesirable consequences of using noise barriers (id.).

Switching Station (Company Brief at 90, citing Exh. NG-2, at 115, 118-119; EFSB-NO-11; Tr. 2, at 247). Substation and switching station construction would take place within the construction hours stated in Section VI.C.8 (Exh. NG-2, at 110).[71]

The Company reported that there are three commercial structures but no residential structures within 50 feet of the proposed Waite Street Switching Station (RR-EFSB-15). Based on soil boring at the Waite Street Switching Station, the Company indicated that ledge and associated rock drilling would not be necessary (Exh. NG-2, at 115, 118 to 119; EFSB-NO-11; Tr. 2, at 247). The Company noted that construction of substation upgrades and the proposed Waite Street Switching Station would be required regardless of the route selected and substation noise impacts do not differ between the Primary Route and the Noticed Alternative Route (Exh. NG-2, at 110).

There are no residential, commercial, or industrial buildings within 50 feet of the Beverly #12 Substation or the East Beverly #51 Substation (RR-EFSB-15). The nearest residence to the East Beverly #51 Substation would be 400 feet from the closest limit of work for the Project (Exh. NG-2, at 115). Furthermore, NEP asserted that vegetative screening in the vicinity of the East Beverly #51 Substation would reduce the effect of Project noise on neighboring residences (id.).

NEP characterized land uses to the north and east of the Beverly #12 Substation site as primarily commercial and industrial, without sensitive receptors and therefore unlikely to be affected by construction noise (Exh. NG-2, at 112). The nearest residence to the south of the Beverly #12 Substation site, is approximately 100 feet from the limit of proposed work for the Project (id.). The Company stated that it would mitigate noise impacts for this residence in the same manner as for the New Cable installation (id.).[72]

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71 NEP stated that at certain points during construction, due to schedule or outage constraints, extended work hours might be required at the Beverly #12 Substation, East Beverly #51 Substation, and/or the proposed Waite Street Switching Station (Exh. NG-2, at 110). The Company indicated, however, that it would avoid extended work hours at the identified facilities to the extent practicable (id.).

72 Noise mitigation would include: requiring well-maintained equipment with functioning mufflers; replacing louder pieces of equipment with quieter units; scheduling loud

ii. Operational Noise

NEP stated that new equipment proposed for the East Beverly #51 Substation and the Waite Street Switching Station would not produce an increase in operational noise levels over existing conditions (Company Brief at 90, citing Exh. NG-2, at 115, 118-119; EFSB-NO-11; Tr. 2, at 247). The Company stated that the proposed 115/13.2 kV power transformer would be the only new source of operational noise at the Beverly #12 Substation (Exh. NG-2, at 112). NEP performed a sound monitoring and modeling study to assess the potential sound impacts from the new transformer (id.). NEP conducted long- and short-term baseline sound monitoring to establish the ambient sound conditions near the site (id.).[73] NEP then used a computer model to predicted future maximum sound levels from the new transformer at ten noise sensitive areas representing the nearest residences (id., app. 5-5, at 14-18).

Modeling for Beverly #12 Substation indicated that the lowest nighttime sound levels would increase by 1.1 dBA or less at all but three locations (Exh. NG-2, app. 5-5, at 14-18).[74] At these three locations – 2 Webber Street, 23 River Street, and 4 Marshall Court – the modeled increase would be 3.7 dBA, 4.7 dBA, and 6.2 dBA, respectively (id., app. 5-5, at 15). At the three named locations, the increases would be well below the 10-dBA incremental limit allowed by the MassDEP Noise Policy and the City of Beverly Board of Health Noise Control Regulations (id., app. 5-5, at 16). In addition, the Company indicated that the proposed new transformer would not produce "pure tone" sounds as defined by MassDEP (id., app. 5-5, at 19).

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activities during regular work hours to the extent possible; using low-noise generators; and requiring strict compliance with the Massachusetts anti-idling regulations (Exh. NG-2, at 101).

73 NEP collected long-term (i.e., continuous recording for seven days) ambient noise measurements at the Beverly #12 Substation property boundary representative of the nearest residential areas (Exh. NG-2, app. 5-5, at 7). NEP collected short-term noise measurements at five other locations representative of nearby residential and commercial land uses to establish nighttime noise levels (Exh. NG-2, app. 5-5, at 11-12). Sound measurements were collected during the month of January (id., app. 5-5, at 1).

74 NEP asserted that 3 dBA is generally accepted as the threshold for a perceptible increase in noise (Exh. NG-2, at 112).

b. Analysis and Findings on Noise

The record shows that the potential for noise impacts from construction activities during Project installation depends on the equipment used, the hours of work, and the specific receptors along the route. Installation of the New Cable would create noise during the 18-month installation period; operation of the New Cable itself would not generate noise. The record shows that typical construction activities including concrete removal, truck movements, heavy equipment operations would be the source of most noise in the process of New Cable construction. The trenchless crossing along at River Street outside of the Beverly #12 Substation is required for either route. The selection of a specific route would not affect the construction period noise impacts from upgrades at the Beverly #12 Substation and the East Beverly #51 Substation or construction of the Waite Street Switching Station. In addition, Existing Cable removal activities would occur regardless of the route chosen.

The number of receptors adjacent to construction is an important determinant of the comparative impacts of construction-related noise along the Primary and Noticed Alternative Routes. The record shows that there are fewer structures within 50 feet of the Primary Route compared to the Noticed Alternative Route. The length of exposure to construction-generated sound is another noise impact determinant. The record shows that the Primary Route would involve a shorter route, fewer subsurface utility crossings, fewer linear feet of shallow bedrock, require one fewer manhole, and fewer route bends compared to the Noticed Alternative Route. As a result, constructing the New Line along the Primary Route would likely require less time and have lower noise impacts overall. The Siting Board therefore finds the Primary Route preferable to the Noticed Alternative Route with respect to construction noise impacts.

Removing the Existing Cable would be required regardless of the route selected. The record shows that the Existing Cable from the MBTA ROW is subject to MBTA scheduling and that night-work would be required. The Siting Board recognizes the scheduling constraints and safety considerations associated with removing the Existing Cable from an active railroad right of way, but also observes the disruptive consequences of doing so at night. As such, the Siting Board directs NEP to use portable noise barriers wherever practicable to further mitigate the

noise impacts of removing the Existing Cable from the MBTA ROW on abutting residential areas.

The Company has committed to strict compliance, for itself and its contractors, with MassDEP's anti-idling regulations. In addition, NEP will minimize noise from cable splicing with use of low-noise generators and will schedule loud activities so as to avoid nighttime hours to the extent possible. The record shows the Company will confine most Project work to the hours of 7:00 a.m. and 4:30 p.m., Monday through Friday, in Beverly and 8:00 a.m. to 5:00 p.m. in Salem, Monday through Friday, in accordance with the Beverly MOA, Salem MOA, and noise ordinances of the respective municipalities. As noted above, construction would only occur for discrete periods of time at any point along the route.

The Siting Board directs the Company to limit construction to Monday through Friday during the hours between 7:00 a.m. and 4:30 p.m. in Beverly, and 8:00 a.m. to 5:00 p.m. in Salem, except by request of the Cities of Beverly or Salem or of an agency with oversight of operations potentially affected by the Project, such as the MBTA. Work requiring longer continuous duration than normal construction hours allow, such as cable splicing, is exempted from this condition. The Siting Board also directs the Company to coordinate with the Cities of Beverly and Salem, and the MBTA or other jurisdictional agencies, to determine which areas, such as schools, where construction hour limitations may be appropriate to mitigate noise or other concerns. Should the Company need to extend construction work beyond the above-noted hours and days, with the exception of emergency circumstances on a given day necessitating extended hours, the Company shall seek written permission from the relevant municipal authority before the commencement of such work, and to provide the Siting Board with a copy of such permission. If the Company and municipal officials are not able to agree on whether such extended construction hours should occur, the Company may request prior authorization from the Siting Board and shall provide the relevant municipality with a copy of any such request.

The record also shows that noise levels to be associated with nighttime (after 5:00 p.m.) cable splicing could be disruptive in residential areas where these activities are near homes. The Siting Board therefore directs NEP, in addition to using newer, lower-noise-generating

equipment, to also use portable noise barriers to mitigate the noise impact of nighttime cable splicing operations that occur within 75 feet of a residential structure.

Regarding the East Beverly #51 Substation and the Waite Street Switching Station, the record shows that there would be no new noise sources at either location as a result of the Project, and that construction period noise would be limited. Regarding the Beverly #12 Substation, the record shows modeled operational noise levels of up to 6 dBA above background levels at one residence on Marshall Court, immediately south of the substation. The Siting Board directs the Company to investigate means to reduce Project sound levels at this location; the Company shall report to the Siting Board prior to construction any actions to be taken to effect such noise mitigation.

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

4. Visual

a. Company Description

NEP stated that, because it would locate the New Cable underneath the streets of Beverly and Salem, and underneath the Veterans Memorial Bridge, there would be no permanent visual impacts, regardless of whether the Project is constructed along the Primary Route or the Noticed Alternative Route (Exhs. NG-2, at 108; EFSB-V-10). Removal of the Existing Cable will take place at night (between 1:00 a.m. and 5:00 a.m.), and NEP will need to use lighting for the work (Exh. NG-2, at 123).

The Company represented that new equipment proposed for the Beverly #12 Substation would integrate, physically and visually, into the existing facilities, with relatively limited expansion of the inner northwest substation fence (Exhs. NG-2, at 111-112; EFSB-V-1; EFSB-V-2). Furthermore, the Company characterized the area surrounding the substation as primarily commercial and industrial land uses; therefore, NEP indicated that the new equipment proposed for the Beverly #12 Substation would be consistent with the character of the surrounding area (Exh. NG-2, at 112; Tr. 2, at 307-308). Consequently, the Company asserts, the visual impacts will be minimal (Company Brief at 85, citing Exh. NG-2, at 112).

With respect to improvements at the East Beverly #51 Substation, NEP would install new equipment within the existing substation yard, which is currently screened from neighboring residences and roads by vegetation and topography (Exhs. NG-2, at 115; EFSB-V-1; EFSB-V-2; Tr. 2, at 307-308). Therefore, the Company anticipates minimal visual impacts to neighboring land uses (Company Brief at 86, citing Exh. NG-2, at 115).

The Waite Street Switching Station is proposed in a developed area, with existing residential, commercial, and industrial land uses abutting the property on three sides; the nearby existing land uses would have open views of the switching station (Exh. NG-2, 118, app. 5-4).[75] Because the proposed Waite Street Switching Station would result in a permanent land use change, the Company developed visual simulations (id.; Exh. EFSB-V-5). Visually prominent features of the Waite Street Switching Station would include electrical equipment; a control house building elevated six feet above grade; and one 95-foot-tall H-frame dead-end structure to support a tap for the New Cable from existing overhead lines (Exhs. NG-2, at 118, app. 5-4; EFSB-V-4). NEP stated that overhead transmission lines already span the parcel (Exh. EFSB-V-5).

Design plans for the Waite Street Switching Station indicate that it would be surrounded by a 12-foot-high chain-link security fence, topped with barbed wire, and covered with a mesh fabric (Exh. NG-2, app. 5-3, at 3). The Company stated that it would be difficult to mitigate visual impacts at the Waite Street Switching Station site with landscaping measures because of the clearance required from proposed overhead transmission lines, and the lack of available space on the parcel (Exh. NG-2, at 118).[76] In addition, The City of Salem has requested that

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75 At the proposed Waite Street Switching Station, the Company states, the nearest residences would be approximately 285 feet to the north, 190 feet to the south, 2,770 feet to the east, and 195 feet to the west (Exhs. NG-2, at 120; EFSB-V-6). The nearest businesses would be 15 feet to the west, 65 feet to the north, and 40 feet to the south (Exhs. NG-2, at 120; EFSB-V-6).

76 The Company described the neighborhood as commercial/industrial and added that the visual impact of the Waite Street Switching Station would be consistent with the neighborhood's present character (Tr. 2, at 309). NEP indicated that, while it did not anticipate having room to add landscaping at Waite Street, it would consider the feasibility and benefit of any related requests from stakeholders (id. at 308). The

NEP construct a sidewalk on Ferry Street (one side of the Waite Street parcel), further limiting the available space at the proposed Waite Street facility for landscaping (id.).

NEP asserted that the mesh-covered chain-link fence surrounding the Waite Street Switching Station would provide visual screening and mitigation (Company Brief at 86, citing Exh. EFSB-V-5). NEP also asserted that, due to the presence of existing overhead transmission lines, the proposed overhead tap is not expected to negatively impact the visual character of the area (id.).

b. Analysis and Findings on Visual Impacts

The record shows that NEP would install the New Cable underground in roadways along either the Primary or Noticed Alternative Route, resulting in no permanent visual impacts. Removal of the Existing Cable, however, will require lighting to support nightwork for the removal of the Existing Cable. The Siting Board directs the Company to consider use of lighting measures in conjunction with removal of the Existing Cable that minimize dispersion onto adjacent land uses.

The record also shows upgrades at the Beverly #12 Substation and East Beverly #51 Substation and the proposed Waite Street Switching Station, would be required to connect the New Cable, regardless of the route selected. New equipment at the Beverly #12 Substation would be consistent with the current use and visual appearance of facilities at that location. Similarly, new equipment at the East Beverly #51 Substation would be installed within the existing substation yard, which is screened by vegetation and topography from neighboring land uses.

The record shows that abutters to the proposed Waite Street Switching Station would have open views of new electrical equipment and a new H-frame transmission structure necessary to support the tap line for the New Cable. Mitigating visual impacts with landscaping is not feasible due to the small size of the switching station parcel. The Waite Street Switching Station would be surrounded by a relatively tall, mesh-covered security fence that would screen

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Company reported that there had been no discussion about the possibility of using decorative fencing or walls to screen the proposed switching station (id. at 309).

immediate, ground-level views of the switching station to the nearest residences, businesses, and passersby. The area around the Waite Street Switching Station already includes overhead transmission lines and structures; therefore, the new structures supporting the tap line would be consistent with existing views of the area.

Modifications to the Beverly #12 and East Beverly #51 Substations, and the construction of the Waite Street Switching Station would be the same for the Project regardless of the route selected. Furthermore, construction-period visual impacts associated with removing the Existing Cable would be the same regardless of the route selected. The Siting Board therefore finds the Primary Route and the Noticed Alternative Route comparable with respect to visual impacts. The Siting Board also finds the visual impacts of the Project along the Primary Route would be minimized.

5. Air

a. Company Description

NEP stated that the circuit switchers currently in place at the East Beverly #51 Substation and the Beverly #12 Substation contain pressurized sulfur hexafluoride ("SF_6"); each circuit switcher contains 8.4 pounds of SF_6 (Exh. EFSB-A-1). The East Beverly #51 Substation has four existing circuit switchers; the Project would not change the amount of SF_6 used at this substation (id.). At the Beverly #12 Substation, a second circuit switcher would be added for the Project (id.; Exh. RR-EFSB-17). At the proposed Waite Street Switching Station, NEP would install one circuit switcher (Exh. EFSB-A-1; RR-EFSB-17).[77] NEP anticipated that each of the two new circuit switchers would contain 8.4 pounds of SF_6 (Exh. EFSB-A-1). NEP stated that, because circuit switchers are factory sealed and not designed to be refilled, SF_6 leaks are rare (RR-EFSB-17).[78]

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[77] NEP stated that it would not store excess SF_6 at Beverly #12 Substation, East Beverly #51 Substation, or the Waite Street Switching Station (Exh. EFSB-A-1).

[78] NEP reported that it currently has over 500 circuit switchers in service and has replaced fewer than five interrupter units in the past ten years due to low SF_6 (RR-EFSB-17).

During Project construction, NEP stated that potential air impacts related to vehicles and soil management would be temporary (Exh. EFSB-A-2). To minimize air impacts, the Company would handle soil using the "clean trench" method, whereby soil is loaded directly into a dump truck rather than being stockpiled along the side of the trench (id.). This method of soil handling would reduce the size of its work area and minimize the potential for nuisance dust (Exhs. NG-2, at 84; EFSB-A-3). NEP would also use water trucks with misters for dust control during construction (Exh. EFSB-A-2).[79]

All Project work performed by the Company or its contractors would comply with state law (M.G.L. c. 90, § 16A) and MassDEP regulations (310 CMR 7.11(1)(b)) pertaining to air pollution and air quality standards (Exh. NG-2, app. 6-1, att. A at A-22). The Company also represented that all Project work it or its contractors performed would comply with MassDEP's anti-idling regulations (Exh. EFSB-A-2). For any diesel-powered non-road construction equipment rated 50-horsepower or above whose engine is not certified to USEPA Tier 4 standards, and that will be used for thirty days or more over the course of the Project, the Company would direct its contractors to retrofit the equipment with USEPA-verified (or equivalent) emission control devices (e.g., oxidation catalysts or other comparable technologies) (id.). The Company uses exclusively ultra-low-sulfur diesel ("ULSD") fuel in its own diesel-powered construction equipment and would require its contractors to do the same (id.).[80]

b. Analysis and Findings on Air Impacts

The record shows that the Company has made a number of commitments to limit potential air impacts of the Project, including a commitment to implement construction BMPs for dust suppression and control and to comply with state law, regulations, and requirements concerning air pollution/air quality standards, diesel retrofits, and ULSD fuel.

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79 The Company will not use salts or wetting agents (Exh. EFSB-A-2). If soil stockpiling is necessary for excavations within the substation yards, a tackifier may be used to limit dust creation (Exh. EFSB-A-3).

80 ULSD has a maximum sulfur content of 15 parts per million compared to 500 parts per million for low-sulfur diesel fuel (Exh. EFSB-A-2).

The record shows that the Company will add equipment containing SF_6 at the Beverly #12 Substation and the Waite Street Switching Station and would not store SF_6 at the substations or switching station associated with the Project. Furthermore, the Company does not "top off" but replaces circuit switchers that are low on SF_6. As an indication that SF_6 leaks are rare, the record shows that the Company has replaced very few circuit switchers for low SF_6 over the past ten years.

The Siting Board finds that air impacts of the Project along the Primary Route and the Noticed Alternative Route would be comparable. The Siting Board finds, in addition, that potential air impacts of the Project along the Primary Route would be minimized.

6. Hazardous Waste and Safety

a. Company Description

i. Potential to Encounter Subsurface Contamination

Construction of the Project may result in the excavation of materials that have been contaminated by historical releases or former land uses in the vicinity of either the Primary or the Noticed Alternative Routes (Exh. NG-2, at 101). The Company would handle any contaminated soils encountered during the construction process in accordance with the MCP (310 CMR 40), including notifying MassDEP and undertaking appropriate cleanup measures (id., app. 6-1, att. A at A-27).

NEP undertook an online review of the MassDEP database of disposal sites regulated under the MCP (i.e., sites identified by release tracking number ("RTN")) within 500 feet of the Primary and Noticed Alternative Routes to ascertain the potential to encounter subsurface contamination along the Primary and Noticed Alternative Routes (Exh. NG-2, at 67, 101). The Company reported five sites along the Primary Route, eight sites along the Noticed Alternative Route, and 19 sites along segments common to both routes (Exh. EFSB-S-11(R1)). NEP noted that disposal sites with an assigned RTN include both open and closed sites, including sites closed with an activity use limitation (id.). Based on this comparison, NEP contends that the Primary Route has a lower potential to encounter subsurface contamination during construction, and this route is therefore superior to the Noticed Alternative Route for this criterion (Company Brief at 75 citing Exh. NG-2, at 101). NEP reported 19 disposal sites along the Existing Cable

route (Exh. NG-2, app. 6-1, at A-17). If dredging is required when removing a submarine portion of the Existing Cable, NEP would characterize sediment prior to dredging, as required by MassDEP, to identify appropriate measures for handling and disposal (id., app. 6-1, at A-27 to A-28, A-42).

With historical use as a manufactured gas plant, the Beverly #12 Substation has a history of contamination (Exh. NG-2, at 112). However, RTNs associated with the site are closed and there are no recorded AULs for the site (id.). The East Beverly #51 Substation is an AUL site on the MassDEP Site List for reportable releases (id. at 116). There is no record of contamination in the Waite Street property itself, but the adjacent Salem LNG Facility is a Tier II Chapter 21E Site on the MassDEP Site List (id. at 119). The Company stated that it would handle any contaminated material or soils encountered during Project construction at the stations as discussed below (id. at 112, 116, 119).[81]

NEP stated that it would contract with a Licensed Site Professional ("LSP") to manage contaminated soil and/or groundwater encountered during Project construction pursuant to the applicable provisions of the MCP (Exh. NG-2, at 101; Tr. 2, at 315).[82] When excavating in streets near sites with known contamination, NEP would have an LSP on site during construction (Tr. 2, at 315). The LSP would visually screen and/or potentially use monitoring equipment to screen for the presence of contaminated soils and to manage any such soils encountered (id.).

ii. Construction Waste

The Project would generate construction debris including asphalt, brick, and concrete (Exh. EFSB-S-3).[83] NEP estimated construction of the Primary Route would result in about

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81 NEP would require its contractor to have spill response materials available at all times during construction (Exh. EFSB-S-5). The materials would allow response to potential releases of diesel fuel and hydraulic fluids from excavators, backhoes, and other typical construction equipment (id.).

82 According to NEP, the regulatory mechanism for managing contaminated media might include a URAM, RAM, or Immediate Response Action, depending on site-specific conditions (Exh. NG-2, at 101-102).

83 NEP reported that the mineral oil dielectric fluid does not contain polychlorinated

1,140 cubic yards of construction debris, compared to 1,390 cubic yards of construction debris for the Noticed Alternative Route (id.). NEP stated it would recycle construction debris at approved facilities to the extent possible (Exh. EFSB-S-3). With regard to removing the Existing Cable, NEP stated it would first remove dielectric fluid from the Existing Cable (id.). Dielectric fluid would then be trucked away for offsite recycling and/or disposal; the Company estimated the total volume of dielectric fluid at 6,800 gallons (id.). NEP would roll the cable itself onto reels or cut it into manageable lengths, then ship the cable off-site for recycling and/or disposal (id.). Removal of the Existing Cable and associated quantities of waste generated would be the same for both routes (id.).

The Company stated that some of the new equipment installed at the Beverly #12 Substation would use oil for insulation (Exh. EFSB-S-6). A release of oil to the environment, which is considered toxic, could affect the substation trap rock and underlying soil (id.). The Company stated that it regularly inspects station equipment for correct operation, and that equipment failure would result in a trouble alarm sounding at the system control center (id.). NEP would respond to any trouble alarms and equipment failures and conduct spill cleanup in accordance with the MCP (id.).

iii. Safety

NEP stated it would design, build, and maintain the Project to protect the health and safety of workers and the public (Exhs. NG-2, at 89; JR-2-4; JR-2-5). The Company would accomplish this goal by complying with all applicable federal, state, and local safety standards as well as with its own safety policies and best practices during construction (Exhs. NG-2, at 89, 130; EFSB-S-1). The Company would comply with the Occupational Safety and Health Act, which sets and enforces protective workplace safety and health standards (Exhs. NG-2, at 130; EFSB-S-1). NEP would also design, build, and maintain the Project in accordance with the Massachusetts Code for the Installation and Maintenance of Electric Transmission Lines (220 CMR 125.00) and the National Electrical Safety Code (Exh. NG-2, at 89). Furthermore,

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biphenyls (PCBs) but is included in the Massachusetts Oil and Hazardous Materials List, 310 CMR 40.1600, and is therefore regulated by the MassDEP (RR-EFSB-12).

NEP would design Project facilities in accordance with sound engineering practice, i.e., using established design codes and guides issued by the Department, the Institute of Electrical and Electronic Engineers, the American Society of Civil Engineers, the American Concrete Institute, the American National Standards Institute, and others (id.).

NEP would minimize the risk of failure to any equipment through design requirements, detailed surveys, and damage prevention using maps and records, mark-out, and Dig Safe (Exh. EFSB-S-1). Furthermore, Company personnel would supervise installation of the New Cable as per standard practice (id.). NEP also represented that it planned safeguards and conditions that would prevent risk of a failure of the New Cable that could damage gas distribution lines along the Project: specifically (1) physical barriers, including plastic conduit, several inches of concrete and more than 18 inches of earth separation surrounding the New Cable; (2) use of high speed protective relaying to clear faults quickly (less than 0.15 seconds); and (3) inclusion of continuous ground conductors in the Company's system to carry fault current inside the duct bank in close proximity to the 115 kV cables (Company Brief at 100-101, citing Exh. J-2-05(S1); Tr. 1, at 86-90).

The Company indicated that it would use police details, cones, barricades, signage, electronic sign boards, or any combination of the above, to protect the safety of the public (Exh. EFSB-S-1; Tr. 2, at 273). To prevent the public from accidentally accessing the trench during non-working hours, the Company would either backfill the trench or cover the open trench with road plates (Exh. EFSB-S-1; Tr. 2, at 273).

b. Position of Dr. Rome

Dr. Rome argues that installation of the New Cable on Webber Avenue poses a number of safety concerns.

(1) Construction of the New Cable could result in an accident that compromises an existing 60 pounds per square inch, gauge ("psig") gas line.

(2) Right after the New Cable is energized and for several months, there will be an elevated chance of a cable failure because of undetected manufacturing flaws in

the cable; if cable failure occurs, there will be more construction that could disturb the entire road, potentially causing a fracture of the 60-psig gas line.

(3) There is a possibility of an earthquake exceeding six on the Richter scale, as is believed to have happened in 1775. Such an event could compromise both the gas line and electric cable simultaneously.

(4) As time goes on, cracks may develop in the concrete duct bank carrying the New Cable. Therefore, if there were gas in the soil, a minor arcing leaving the duct bank could spark a fire. This is especially true if the circuit breakers associated with ground fault detectors are slow to react.

(5) There are faults which could lead to cable failure and potentially to explosion that do not necessarily involve an electrical discharge.

(6) The Company will not perform temperature monitoring to assess the 'health' of the New Cable, as would be typical for oil-filled cables. Therefore, the first symptom of a fault in the New Cable would be the failure itself.

(7) A fracture in the nearby water main could result in cable failure if enough soil is washed away to cause the collapse of the duct bank. And under certain circumstances magnetic fields from the New Cable could cause premature corrosion of the water main (Rome Brief at 1-2).

c. Company Response

NEP notes that Dr. Rome's concerns largely stem from an existing 60-psig gas line located in the travel lane on Webber Avenue opposite the New Cable (Company Reply Brief at 1, citing Rome Brief at 1, Exh. JR-02-1).[84] The Company argues that the likelihood of an explosion of the existing gas line, due to such conditions as undetected manufacturing flaws in the New Cable, a major earthquake, cracks in the concrete duct bank, electrical faults, and the proximity of a water main, is remote (Company Reply Brief at 2). The Company contends that it

[84] The Company confines its response to what it considers the most pertinent issues raised in Dr. Rome's brief; the Company states that lack of response in its reply brief does not reflect agreement with the positions taken by Dr. Rome (Company Reply Brief at 1 n.1).

has designed the New Cable to ensure that its construction and operation will not pose a safety risk to the community the New Cable will be designed, constructed, and maintained in accordance with sound engineering practices and all applicable safety codes and best practices (id., citing Exhs. EFSB-S-1, JR-2-05, JR-02-6, Tr. 1, at 85, Tr. 2, at 207-208).

The Company argues that it has fully accounted for the safety and security of the equipment and the public in siting the New Cable on Webber Avenue (id.). NEP asserts that construction of the New Cable under Webber Avenue does not pose unique issues, in that the Company regularly conducts construction of underground infrastructure and follows strict procedural guidelines during all project phases, from planning and engineering to construction and restoration (Company Reply Brief at 2, citing Exh. EFSB-S-2). The Company's electrical engineers are familiar with and will conform the design of the New Cable to the applicable engineering and safety codes and standards for colocation of electric and gas lines in Webber Avenue (id., citing Exh. JR-2-06(S1)).

Section 320B5 of the National Electrical Safety Code governs the minimum separation requirements between underground utilities and sets forth a 12-inch radial separation requirement between underground electric conduits and gas lines (Company Reply Brief at 3, citing Exhs. EFSB-S-2; RR-EFSB-2). NEP has been surveying and mapping the utilities along the entirety of the Project route to confirm the location of any gas lines, including the existing 60-psig gas line (id., citing Exh. EFSB-S-2). As of the date of briefing, the planned location of the New Cable on Webber Avenue is over 21 feet away from the 60-psig gas line, well in excess of the 12-inch minimum standard (id., citing Exh. JR-2-02(S1), Tr. 2, at 207). NEP notes further that the Project will remove the Existing Cable, which is direct-buried in Webber Avenue considerably closer to the gas line, and replace it with a new cable, housed inside PVC conduits, surrounded by a minimum of three inches of concrete, thereby decreasing any risk (id., citing Exhs. EFSB-S-2, JR-2-05(S1)).

NEP argues that Dr. Rome's assertions about explosions resulting from cable failure are not supported by the evidence (Company Reply Brief at 4). The Company notes that solid dielectric cable failure is rare, and that since it first installed this type of cable in 1988, NEP has not experienced a solid dielectric cable failure (id., citing Exh. EFSB-3-3, Tr. 2, at 212, Tr. 3,

at 400). While earthquakes can occur in Massachusetts, NEP argues that in the event of a minor earthquake, the cables can flex within the conduit and in the event of a large earthquake, substation equipment would likely fail first, causing the New Cable to be de-energized without incident (Company Reply Brief at 4, citing Exh. EFSB-3-2, Tr. 1, at 86-89).

In this instance, the Company argues that explosion of gas requires a leak on a gas line that has not had leaks since its installation in 1997; migration of the gas through 21 feet of earth, the concrete duct bank, and the PVC conduit to reach the New Cable; gas achieving a concentration in the explosive range of five to fifteen percent in air; a spark penetrating beyond the cable's dielectric insulation and metallic sheath; and a confined space for the gas (Company Reply Brief at 6-7, citing Exh. EFSB-3-1, Tr. 1, at 85, 90). NEP argues that there is no evidence to support that these hypothetical conditions will occur, never mind simultaneously (id. at 7).

With respect to monitoring the 'health' of the New Cable, NEP argues that, through its control center, it monitors voltages, currents, and system frequencies, that it detects short circuit currents with protective relaying systems; furthermore, it does not anticipate that temperature monitoring would provide any additional benefit (Company Reply Brief at 7, citing Exh. EFSB-3-6, Tr. 3, at 404-405, Tr. 1, at 97). Finally, NEP argues that electric cables are commonly installed in close proximity to water lines under city streets (Company Reply Brief at 7-8, citing Tr. 3, at 357, 390, 392, 395). Based on the magnitude of the current density induced by the New Cable, the effect of the Project on the corrosion rate of the water pipe in Webber Avenue would be minor compared to corrosive soils and direct currents (Company Reply Brief at 8, citing Tr. 3, at 355-356).

d. Analysis and Findings on Hazardous Waste and Safety

The record shows that NEP has reviewed the MassDEP MCP database to evaluate the potential to encounter subsurface contamination along the Primary and Noticed Alternative Routes. Including both open and closed disposal sites, the record shows there are five sites along the Primary Route, eight sites along the Noticed Alternative Route, and 19 sites along segments common to both rotes. Since there are fewer documented disposal sites along the Primary Route, the Siting Board concludes that there is a lower potential to encounter contaminated soil or

groundwater along that route. The record also shows that, wherever contaminated soil or groundwater is encountered during Project construction, NEP will manage it in accordance with the MCP under the supervision of an LSP. Additionally, construction along the Primary Route would generate less construction waste compared to the Notice Alternative Route; NEP would recycle construction waste at approved facilities, to the extent possible.

As previously noted, NEP will remove the Existing Cable regardless of which route is selected; based on the number of disposal sites along the Existing Cable route, NEP may encounter contaminated soil or groundwater during the removal process. Regarding the submarine portion of removing the Existing Cable, NEP anticipates removing it without dredging with approval of MassDEP. If dredging is required, NEP would characterize and manage sediments in Danvers River as required by MassDEP (see Section VI.D.2.a). NEP would recycle and/or dispose of dielectric fluid removed from the Existing Cable and the Existing Cable itself.

To help prevent a release of hazardous materials at either of the substations, the Company would regularly inspect station equipment at both the Beverly #12 and the East Beverly #51 Substations; furthermore, certain types of equipment failure would automatically be reported to NEP's control center. While there is no record of contamination at the Waite Street property, the adjacent Salem LNG Facility is a Tier II 21E Site; NEP would contract an LSP to manage any contaminated soil and/or groundwater encountered during construction. NEP would also require its contractors to have spill response materials ready at all times during construction to allow quick response to any potential diesel fuel and/or hydraulic fluid release.

Based on the record, the Siting Board finds that the Project along the Primary Route would have a lower potential to encounter subsurface contamination and would generate less construction debris and, therefore, is preferable to Noticed Alternative Route in this regard. The Siting Board further finds that impacts along the Primary Route with respect to hazardous waste would be minimized.

NEP has committed to complying with all applicable federal, state, and local safety standards for construction of the Project, in addition to the Company's own safety policies and best practices. On Webber Avenue, the Company would install the New Cable on an alignment

much farther from an existing 60-psig gas line than required by code, and the record shows no unusual safety risks by operation of the New Cable. The record further shows that the protective safety measures put in place for the New Cable would minimize the risk that an accident related to its construction or operation might damage gas distribution lines along the Primary Route. The record also describes the Company's planned coordination with Dig Safe, and its commitment to protect existing utilities through consultation with the Cities of Salem and Beverly.

Based on this record, the Siting Board finds that the Project along either the Primary Route or the Noticed Alternative Route would be comparable with respect to safety. The Siting Board further finds that impacts along the Primary Route with respect to safety would be minimized.

7. Traffic

a. Company Description

To compare potential traffic impacts of the Primary and Noticed Alternative Routes, NEP reviewed existing traffic conditions, the presence of public transit services, and other major transportation facilities for each route (Exh. NG-2, at 96). The Company collected existing information from various sources including MassDOT traffic data, relevant City of Salem and Beverly departments, and public documents; and it conducted field reconnaissance to determine traffic congestion potential along each route (id.; Exh. EFSB-T-1; Tr. 2, at 298-300). Key factors considered included traffic volume counts where available, the presence of major commuting routes, on-street parking, critical intersections, public transit facilities, roadway width, and residential and commercial access (Exh. NG-2, at 96).[85]

NEP stated that the Project segment between the proposed Waite Street Switching Station, in Salem, and the Park Street and Broadway intersection, in Beverly, and again from Cross Lane to the East Beverly #51 Substation, would be the same along both the Primary Route

[85] The Company defined critical intersections as locations marked by significant traffic volume relative to other area intersections, and/or critical, difficult-to-avoid junctions (Exh. NG-2, at 96 n.20).

and the Noticed Alternative Route (Exh. NG-2, at 96). The traffic impacts along those segments, including those associated with the construction of the bridge-mounted conduits across the Veterans Memorial Bridge, would be the same for either route (id.).

As noted in Section V.B, above, NEP proposed the Merrill Avenue Variation in Salem, for both the Primary and Noticed Alternative Routes (Exh. NG-2, at 46, 77). The Company stated that the Primary Route would have lower traffic impacts compared to the Merrill Avenue Variation because the Merrill Avenue Variation would use a longer portion of Bridge Street, which is heavily trafficked (id. at 46). NEP stated that it would need to use the Merrill Avenue Variation if it were unable to maintain access for LNG tanker trucks to the Salem LNG facility on Pierce Avenue (id. at 46, 77).

Tables 7 and 8 below provide NEP's summary of roadway characteristics along distinct (non-common) roadways of the Primary and Noticed Alternative Routes (Exh. NG-2, at 96-98).

Table 7. Roadway Characteristics of the Primary Route.

Roadway Segment	Road Width	Existing Characteristics
Broadway (from Park Street to Cabot Street)	32	- Critical intersection at Rantoul Street - On-street parking - Primarily services residential properties
Thorndike Street (from Cabot Street to Endicott Street)	37	- Critical intersection at Cabot Street - On-street parking
Endicott Street (from Thorndike Street to Monument Square)	30	- On-street parking - Primarily services residential properties
Monument Square (from Endicott Street to Hale Street)	30	- No significant traffic features
Hale Street (from Monument Square to Lothrop Street)	33	- On-street parking - Westbound bike lane - Commuter Route
Lothrop Street (from Hale Street to Cross Lane)	27	- Critical intersection at Hale Street - On-street parking - Primarily services residential neighborhoods

Source: Exh. NG-2, at 96-97.

Table 8. Roadway Characteristics of the Noticed Alternative Route		
Roadway Segment	**Road Width**	**Existing Characteristics**
Pleasant Street/Park Street (from Beverly #12 Substation to Roundy Street)	26	- On-street parking - Primarily services commercial properties
Roundy Street (from Park Street to Cabot Street)	25	- One-way traffic (eastbound) - Critical intersection at Rantoul Street - On-street parking - Services both residential and commercial properties
Cabot Street (from Roundy Street to Charnock Street)	38	- Commuter route - Public transit route (MBTA 451 bus route) - Primarily services commercial properties
Charnock Street (from Cabot Street to Essex Street)	25	- One-way traffic (westbound) - Critical intersection at Cabot Street - On-street parking
Essex Street (Route 22) from Charnock Street to Newbury Street)	38	- On-street parking - Commuter route - Primarily services residential properties
Newbury Street/Pearl Street/Pearl Street Extension (from Essex to Lake Shore Avenue)	30	- On-street parking - Low traffic volume
Lake Shore Avenue (from Pearl Street Extension to Cross Lane)	22	- Low traffic volume

Source: Exh. NG-2, at 96-97.

The Company would require a minimum eleven-foot-wide construction corridor for the proposed trench construction along either the Primary Route or the Noticed Alternative Route (Exh. EFSB-T-7). The Company indicates that in general, it will seek to maintain two lanes of traffic, in some cases by temporarily restricting on-street parking (Exh. EFSB-T-13).

The Company contends that the Primary Route would be slightly preferable to the Noticed Alternative Route considering factors such as critical intersections, on-street parking, commuter and public transit routes, roadway width, and land uses (Company Brief at 74, citing Exh. NG-2, at 97-98). For unique portions of the routes, the Primary Route would generally use streets which the Company characterized as having lower traffic volumes compared to the Noticed Alternative Route (id. at 98). The Company relied on traffic volume data from the published MassDOT Transportation Data Management System in its comparison

of traffic volume along roadway segments for both routes, noting unusually high or low traffic volumes where appropriate (id. at 96-98; Exh. EFSB-T-1). NEP anticipated that the 0.4-mile shorter length of the Primary Route relative to the Noticed Alternative Route would also result in fewer traffic impacts in a city-wide context (Exh. NG-2, at 98). The Noticed Alternative Route would traverse one more bus stop compared to the Primary Route; however, the bus route would remain in service during construction, though one stop common to both routes might be relocated (Exh. EFSB-T-15). NEP stated that it did not expect Project-related road closures along bus routes (id.).

The Company stated that both routes traverse streets with on-street parking that would be temporarily unavailable during construction (Exh. NG-2, at 98). The Primary Route would use a half-mile less of narrow roadways (i.e., with an average curb-to-curb width of less than 30 feet) than the Noticed Alternative Route, corresponding to a reduced need for lane closures or detours (id.). NEP noted that traffic impacts associated with the Project would be temporary in nature and confined to the duration of Project construction (id. at 95).

NEP represented that it would work closely with MassDOT and various departments of the Cities of Salem and Beverly to develop TMPs to manage traffic impacts during construction (Exhs. NG-2, at 98; EFSB-T-10; Tr. 1, at 119-120). NEP's TMPs would address measures including: ongoing coordination with police and fire departments; provisions for emergency vehicle access at all times; establishing work zone dimensions that minimize impacts to vehicular traffic movement and promote safe passage; construction work schedules and associated duration of lane closures, road closures, and/or detours; use of traffic control devices;[86] identifying points where driveway access must be maintained; routing and safeguarding of pedestrian and bicycle traffic; adjustment of MBTA and school bus routes (Exhs. NG-2, at 98-99; EFSB-T-12; EFSB-T-13; EFSB-T-14; EFSB-T-15).

The Company would develop its TMPs in a manner consistent with the Federal Highway Administration's Manual on Uniform Traffic Control Devices for Streets and Highways and the

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[86] Traffic control devices may include barricades, reflective barriers, advance warning signs, traffic regulation signs, traffic control drums, flashers, detour signs, and other protective devices as approved by Salem and Beverly (Exh. NG-2, at 99).

MassDOT's publication Work Zone Safety (Exh. NG-2, at 99). Once developed, NEP would submit the TMP to appropriate Salem and Beverly authorities for review and approval prior to Project construction (id.). The Company stated it would implement a comprehensive construction community outreach plan that would keep property owners, businesses, and municipal officials, including fire, police, and emergency personnel, up to date on planned construction activities (Exhs. EFSB-T-3; EFSB-T-4; EFSB-T-5). Finally, NEP stated it would provide parking for construction workers and other personnel at the construction contractor's laydown yard (Exh. EFSB-T-2).[87]

The Company represented that the location of the Beverly #12 Substation off River Street experiences moderate traffic volume (Exh. NG-2, at 112). NEP further stated that the Boyles Street location of the East Beverly #51 Substation and the Waite and Ferry Street location of the Waite Street Switching Station both experience low traffic volume (id. at 115, 119). NEP maintained that traffic impacts associated with the work at the substations and switching station would be temporary in nature and associated with construction vehicle traffic and equipment delivery (id. at 112, 115, 119). The Company stated it would use mitigation measures similar to those it would employ for in-street construction, described above, to minimize traffic disruption during construction at the stations (id. at 98-99, 112, 115, 119).

The Company indicated that it would coordinate excavation and removal of the Existing Cable with the City of Beverly and that its TMPs would cover the in-street portion of the Existing Cable removal (Exh. NG-2, at 123, app. 6-1, at A-32). NEP stated it would, to the extent possible, maintain access to residences and businesses along the path of cable path and use steel plates to restore access once crews finished (id. at 123). Removal of the cables along the MBTA ROW would be constrained by MBTA scheduling and would likely occur during the evenings or weekends when trains are not running (id.). Activities to remove the land-based portion of the Existing Cable would take approximately two to five nights to complete at any particular business or residence (id.).

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[87] NEP explained that its request for proposals would require contractors to specify laydown areas and worker parking, potential access routes to the work sites, and describe how workers would be transported to work sites, if necessary (Exhs. EFSB-T-2; EFSB-LU-3).

b. Analysis and Findings on Traffic

To assess the potential for traffic impacts related to Project construction along the Primary or Noticed Alternative Routes, NEP reviewed existing traffic conditions and the presence, location, and extent of public transit services (e.g., bus routes, commuter rail). NEP based its assessment on public information and field reconnaissance. Specifically, the Company collected information related to traffic volume, major thoroughfares, busy intersections, and on-street parking.

Traffic impacts would be the same along the roadway segments that are common to both the Primary and Noticed Alternative Routes, as well as the removal of the Existing Cable. The Merrill Avenue Variation would use a longer segment of Bridge Street, which is heavily trafficked; the record shows that NEP would only need to use the Merrill Avenue Variation if it were not able to maintain sufficient access for LNG tanker trucks to the Salem LNG facility. Therefore, the Siting Board separately considers the distinct portions of each route. The record shows that the Primary Route would traverse fewer narrow roadways (i.e., less than 30 feet) and that, generally, the Primary Route follows streets with lower traffic volumes compared to the Noticed Alternative Route. In addition, the Primary Route is 0.4 miles shorter than the Noticed Alternative Route, therefore requiring less construction time and resulting in fewer traffic impacts overall. Traffic impacts, although significant at times, would only occur during Project construction.

NEP would develop TMPs for the Project regardless of the route selected for the New Cable. In developing its TMPs, the Company would work closely with MassDOT and the Cities of Salem and Beverly on mitigation measures addressed above in Section VI.D.7.a. The record shows that TMPs would be developed in accordance with Federal Highway Administration and MassDOT guidelines.

In addition to developing an appropriate TMP, the Company would develop an outreach plan to keep property owners, businesses, and municipal officers (e.g., fire, police, and emergency personnel) up to date on anticipated construction activities. NEP would provide parking for construction crew and other personnel at the construction contractor's laydown yard.

Traffic impacts occurring in conjunction with work at the existing substations and proposed switching station would be temporary and associated with construction vehicle traffic and equipment delivery. The Company plans to use mitigation measures similar to those provided for in-street construction (e.g., coordination with police and fire departments, traffic control devices; see Section VI.D.7.a) to minimize potential traffic congestion during construction at the Beverly #12 and East Beverly #51 Substations and the Waite Street Switching Station.

The Siting Board finds the Primary Route preferable to the Noticed Alternative Route taking into account route length, parking availability during construction, roadway width, potential disruption to bus service, and traffic volume and congestion. The shorter length of the Primary Route results in fewer traffic impacts overall; for distinct portions of the routes, the Primary Route follows streets with lower traffic volumes resulting in additional reductions to traffic impacts. The Siting Board also notes that NEP has committed to working closely with jurisdictional roadway authorities to mitigate traffic impacts and to develop TMPs that reflect that coordination to reduce Project traffic impacts to the extent possible.

The Siting Board specifically directs the Company to arrange for off-peak delivery of Project equipment and materials and to develop TMPs for the Project, as the Company indicates it will do. The Siting Board also directs the Company to submit a copy of final TMPs to the Siting Board when available, but no less than two weeks prior to the commencement of construction, and to publish the TMPs on the Company's Project website to ensure availability of traffic-related planning information for the Project area. The Siting Board approves the use of the Merrill Avenue Variation in the event that the Company is not able to maintain access for LNG tanker trucks to the Salem LNG facility using the Primary Route. The Siting Board directs NEP to modify its TMPs to address the Merrill Avenue Variation in the event the Company needs to avoid Pierce Avenue. With the implementation of the above equipment delivery, TMP development, and communications outreach plan conditions imposed above, the Siting Board finds that traffic impacts of the Project along the Primary Route would be minimized.

8. Magnetic Fields

a. Background

Magnetic fields are present whenever current flows in a conductor; they are not dependent on the voltage on the conductor (Exh. NG-2, at 106). At any point, the strength of the magnetic field depends on characteristics of the source; in the case of power lines, magnetic-field strength is dependent on the arrangement of conductors, the amount of current flow, and distance from the conductors (id., app. 5-7, at 2). Magnetic fields from transmission lines generally decrease with distance from the conductors (id., app. 5-6, at 4).

Over the years, some epidemiology studies have reported statistical associations between power-frequency magnetic fields and diseases such as childhood leukemia (RR-EFSB-24(1) at 9-12). In 2007, the World Health Organization ("WHO") concluded that the evidence of a causal relationship is limited and that magnetic field exposure limits based upon epidemiological evidence are not recommended, but some precautionary measures are warranted (id. at 12-14). When reviewing magnetic fields in past proceedings, the Siting Board, in recognition of public concern about magnetic fields and in keeping with WHO guidance, has encouraged use of low-cost measures that would minimize magnetic fields along transmission ROWs. Andrew-Dewar at 88; Sudbury-Hudson at 154; New England Power Company d/b/a National Grid, EFSB 13-2/D.P.U. 13-15/13-152, at 88 (2014) ("Salem Cables").

b. Company Description

NEP stated that the duct bank proposed for the Project would be of the same design and generally the same depth across either route (Exh. NG-2, at 107). The Company asserted that, accordingly, magnetic fields associated with operation of the New Cable would be similar along both the Primary and Noticed Alternative Routes (id.). Consistent with Siting Board precedent encouraging reduction of magnetic fields, the Company stated it has designed the New Cable to be constructed underground and with a small phase-to-phase separation distance which reduces magnetic field exposures (id. at 108, app. 5-6, at 8). The Company further declared that this practice is consistent with the guidance of the WHO and other health agencies (id. at 107).

The Company modeled magnetic field levels at one meter above pavement along the centerline of the duct bank for five duct bank configurations: delta, manhole entry, flat, MBTA,

and Bridge (Exh. NG-2, at 106, app. 6-1, at 3, 6). NEP would construct the New Cable duct bank in the delta configuration for the majority of the route, transitioning to a vertical configuration on manholes approaches (id. at 106, app. 6-1, at 3). A flat configuration is likely at shallow burial areas for relatively short sections (id.). The New Cable would be in a square configuration where Congress Street crosses the MBTA Eastern Route Main Line and along the Veterans Memorial Bridge (id.). Burial depths for the New Cable would typically range from 2.5 to 10 feet depending on subsurface conditions (id. at 106).[88]

The Company indicated that magnetic field levels were forecasted at average annual loads and expected peak loads on the transmission system (Exh. NG-2, at 106).[89] Under typical conditions, loading on the New Cable would be higher between the Waite Street Switching Station and the Beverly #12 Substation than between the Beverly #12 Substation and East Beverly #51 Substation (id.). NEP modeled magnetic field levels for each of the five proposed duct bank configurations of the New Cable for each of these segments; the modeling applies to either the Primary or the Noticed Alternative Routes (id. at 106-107, app. 5-6, at 9-13). For its model, NEP assumed a burial depth of 2.5 feet for the delta, manhole entry, and flat configurations and 5 feet for the MBTA and bridge crossings (id., app. 5-6, at 3). Table 9, below, provides these calculated magnetic field levels, directly over the duct bank, and at 10 feet and 25 feet from the centerline (id. at 106 to 107, app. 5-6, at 9 to 13).

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88 Where the duct bank would cross over utilities or rock, NEP explained that it might use the flat configuration, resulting in a duct bank constructed at depths less than 2.5 feet below grade (Exh. NG-2, at 106). In such instances, the Company would install steel plates over the duct bank for mechanical protection (id.).

89 For the "Waite Street to Beverly #12" segment, NEP assumed an average load of 51 MVA and a peak load of 89 MVA (Exh. NG-2, app. 5-6, at 4). For the "Beverly #12 to East Beverly #51" segment, NEP assumed an average load of 40 MVA and a peak load of 77 MVA (id.). Typical peak load occurrence: 14 days/year at 3-4 hours of peak load/day, projected here for line loadings in 2023 (Exh. EFSB-MF-6).

Table 9. Calculated Magnetic Field Levels milligauss ("mG") at Average/Peak Loading for the Proposed Duct Bank Configurations at Minimum Target Burial Depths.[90]

Configuration	Segment	-25 feet	-10 feet	Max.	+10 feet	+25 feet
Delta	Waite St. to Beverly #12	3.5/ 6.25	10/ 17	24/ 41	9.9/ 17	3.4/ 6.25
	Beverly #12 to East Beverly #51	2.8	7.8	19	7.8	2.7
Manhole Entry	Waite St. to Beverly #12	7.6/ 12.75	24/ 42	50/ 88	24/ 42	7.6/ 12.7
	Beverly #12 to East Beverly #51	5.9	19	40	19	5.9
Flat	Waite St. to Beverly #12	3.9/ 7.25	16/ 28	51/ 88	18/ 31	4.3/ 6.25
MBTA Crossing	Beverly #12 to East Beverly #51	3.1	13	40	14	3.3
Bridge	Waite St. to Beverly #12	2.4/ 6.25	9.7/ 17	23/ 39	12/ 21	3.9/ 9

Source: Exhs. NG-2, at 106-107, app. 5-6, at 9-13; EFSB-MF-6; RR-EFSB-25; RR-EFSB-27.

The Company stated that, for the delta configuration, which would comprise the majority of the Project along either route, the highest calculated annual average magnetic field level is 24 mG measured directly over the duct bank (Exh. NG-2, at 107). Modeled field levels decrease rapidly with distance, falling by at least half at a distance of ten feet from the duct bank centerline and to 3.5 mG or less at a distance of 25 feet (id.). The highest calculated magnetic field level for any proposed configuration for the Project at average loading is 51 mG directly above the duct bank for the flat configuration, decreasing to less than 10 mG within 25 feet of the duct bank (id.).

[90] All presented peak loading is for the Waite Street Switching Station to the Beverly #12 Substation portion of the route; loading levels (and, hence, magnetic-field levels) for the Beverly #12 to East Beverly #15 Substation portion of the route would be approximately 13 percent lower (Exh. EFSB-MF-6; RR-EFSB-25). Modeled magnetic fields for the line segment between the Beverly #12 Substation and the East Beverly #51 Substation assumed an average load (Exh. EFSB-MF-6; RR-EFSB-25).

c. Analysis and Findings on Magnetic Fields

The record shows that because NEP would use the same engineering approach for the New Cable (e.g., duct bank configurations, burial depths) for either route, magnetic field strengths along the Primary and Noticed Alternative Routes would be similar. As previously described, land uses along both routes are comparable (see Section VI.D.1). Therefore, the Siting Board finds that the Primary Route and Notice Alternative Route are comparable with respect to magnetic field impacts.

Consistent with WHO recommendations, the Siting Board's practice for magnetic field mitigation is to identify low-cost measures that would minimize exposure to magnetic fields from transmission lines. In prior Siting Board decisions, the Siting Board has recognized public concern about magnetic fields and has encouraged the use of practical and low-cost design to minimize magnetic fields along transmission ROWs. See, e.g., Salem Cables at 88. The Siting Board requires magnetic field mitigation which, in its judgment, is consistent with minimizing cost. NEP would construct the New Cable predominately within public roadways and with relatively close conductor spacing; together, these factors would provide substantial mitigation of magnetic fields.

Based on the design and operation of the Project, as described above, the Siting Board finds that magnetic field impacts of the Project along the Primary Route would be minimized.

9. Summary of Environmental Impacts

The Siting Board finds that the information provided by the Company regarding the Project's environmental impacts is substantially accurate and complete. In comparing the environmental impacts along the Primary and Noticed Alternative Routes, the Siting Board finds that the Primary Route would have lower noise, hazardous waste, and traffic impacts compared to the Noticed Alternative Route. The Siting Board attributes the advantages of the Primary Route to its shorter length and to the fact that the Primary Route would generally traverse less congested streets compared to the Noticed Alternative Route. Approval of the Merrill Avenue Variation accords flexibility for the Company to maintain access for LNG tanker trucks to the Salem LNG facilities.

The Siting Board further finds that land use, visual, air, safety, and magnetic field impacts would be comparable for the Primary and Noticed Alternative Routes given that the Company would install the New Cable underground and within roadways, using the same technology and construction methods, along either route. Finally, the Siting Board finds that the Project would intersect with wetland resource areas along either the Primary or Noticed Alternative Route, but that the Primary Route would have two additional wetland resource area crossings relative to the Noticed Alternative Route. Therefore, we conclude that the Noticed Alternative Route is preferable to the Primary Route with respect to water and wetland resource impacts.

Table 10, below, is a summary table of environmental impact comparisons for the two routes.

Table 10. Comparison of Environmental Impacts, Primary and Noticed Alternative Routes

Impact Category	Primary Route Preferred (+)	Noticed Alternative Route Preferred (+)	Routes Are Comparable (=)
Land Use & Historic Resources			=
Water & Wetlands		+	
Noise	+		
Visual			=
Air			=
Traffic	+		
Safety			=
Hazardous Waste	+		
Magnetic Fields			=

On balance, the Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to environmental impacts, and that environmental impacts along the Primary Route would be minimized.

E. Cost

1. Company Description

For route comparison purposes, the Company initially provided conceptual grade Project cost estimates, including cable removal, of $81.2 million using the Primary Route and $83.6 million using the Noticed Alternative Route, with an uncertainty range of -25%/+50%

(Exh. NG-2, at 7, 43; Tr. 1, at 73; Company Brief at 24 n.12). Table 11, below, provides a breakdown of estimated costs for the New Cable along each route, substation upgrades and new switching station, and Existing Cable removal. NEP's estimate of New Cable construction is $2.4 million greater using the Noticed Alternative Route compared to the shorter Primary Route, while the common project elements would be the same regardless of which route is selected (Exhs. EFSB-C-2; EFSB-C-3).

Table 11. NEP's initial comparative cost estimates (-25/+50%)

Project Element	Primary Route	Noticed Alternative Route
New Cable Installation	$53.63 million	$56.03 million[91]
Substation Work	$15.68 million	$15.68 million
Existing Cable Removal	$11.89 million	$11.89 million
Total	$81.2 million	$83.6 million

Source: Exhs. NG-2, at 7; EFSB-C-2

Focusing on only the Primary Route and common project elements, NEP applied a new probability-based method for estimating project costs partway through the instant proceeding (Tr. 1, at 73-75; Company Brief at 24 n.12). The Company explained that its new probability model uses a Monte Carlo simulation to look at different scenarios related to project risks, which the Company described as useful for evaluating project uncertainties (Tr. 1, at 73, 75; RR-EFSB-4; Company Brief at 24 n.12).[92] The probability-based process provides "probability 50" ("P-50") and "probability 80" ("P-80") cost estimates (Tr. 1, at 75). NEP stated that, for a P-80 estimate, it is assessing that there is a 20 percent chance that project costs would exceed the estimate; for a P-50 estimate, there is a 50 percent chance that project cost would

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91 NEP represented in its application (see Section 1.7.2) that the cost of installing the New Cable along the Primary Route is $53.63 million (Exh. NG-2, at 7). NEP stated that "use of the Noticed Alternative Route (Essex-Pearl-Lake Shore) would increase estimated cable construction costs by $2.4 million" (Exh. EFSB-C-2). Siting Board staff therefore calculates the cost of installing the New Cable using the Noticed Alternative Route to be $56.03 million.

92 NEP represented that its new cost estimating process provides for earlier development of cost estimates than previously, but with an increased level of accuracy due to the addition of a robust qualitative risk analysis process (RR-EFSB-4). The Company stated that the probability-based cost estimating model is widely used in the industry (Tr. 1, at 75).

exceed the estimate (Tr. 1, at 75-76; RR-EFSB-4). The Company provided a P-50 of $76.26 million and a P-80 cost estimate of $78.8 million for the Project along the Primary Route (Tr. 1, at 73-79; RR-EFSB-4).[93]

NEP stated that the N-192 circuit is not designated by ISO-NE as a Pool Transmission Facility; thus, the Company anticipates that none of the costs of the proposed Project would be regionalized across ISO-NE (Exh. EFSB-C-6). NEP stated that the customers who are responsible for non-regionalized costs are all New England Power Company's local network service customers (id.).

2. Analysis and Findings on Cost

The Siting Board requires the petitioner to demonstrate that the proposed route for the transmission facility is superior to the alternative route(s) on the basis of balancing environmental impact, cost, and reliability of supply. G.L. c. 164, § 69J. Further, because G.L c. 164, § 69J provides that "no state agency shall issue a construction permit for any such facility unless the petition to construct such facility has been approved by the [Siting Board]," the Siting Board's balancing of environmental impact, cost, and reliability of supply takes place at a relatively early stage in the engineering design of a particular project. As a result, project cost estimates are typically developed only to an intermediate level of precision. Furthermore, applicants typically do not develop engineering design of alternatives to the same level of detail, so cost estimates for alternatives are necessarily less precise. Sudbury-Hudson at 175; East Eagle at 60-61; Needham-West Roxbury at 72. See also Sudbury v. EFSB, 487 Mass. at 748.

NEP provided estimated costs using two methodologies, conceptual grade estimate for both routes and probability-based estimates for the Primary Route only. The conceptual grade

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93 NEP stated that it did not update the cost estimate for the Project along the Noticed Alternative Route when it developed its P-50 cost estimate because it did not undertake advanced engineering for the Noticed Alternative Route (RR-EFSB-22(R1)). The Company argued that, because the drivers for the comparative cost estimates (e.g., length of in-street construction, number and location of street crossings, repaving requirements) remained unchanged, it was reasonable to assume that the Primary Route remained less expensive than the Noticed Alternative Route under probability cost estimation (Company Brief at 78, citing RR-EFSB-22(R1)).

estimate shows the Primary Route would cost less than the Noticed Alternative Route. NEP's mid-proceeding move to a probability-based model to estimate project costs adds an extra element to the Siting Board's required cost comparison of the Project along the Primary and Noticed Alternative Routes. The Company contends that it cannot calculate cost probabilities for the Project along the Noticed Alternative Route because it did not undertake advanced engineering for the Noticed Alternative Route. A comparison of Primary and Noticed Alternative Route cost estimates using the Company's probability-based modeling approach is therefore not available. NEP argues that the basis for the comparative cost estimates of the routes remains unchanged. Consequently, it asserts, the assumption of the greater cost to construct the Noticed Alternative Route also holds.

The Company's established approach to cost estimate evaluation, however, provides sufficient information to compare costs of the Project along the two routes. The record establishes that the cost of substation upgrades/new switching station and removing the Existing Cable would be the same regardless of the route selected. With respect to New Cable installation, the Company argued, and the Siting Board is persuaded, that the drivers for the comparative cost estimates of the Project (e.g., length of in-street construction, number and location of street crossings, repaving requirements) remain unchanged from the initial estimates to the later probability cost estimates. The Siting Board agrees with the Company that it is therefore reasonable to assume that the Primary Route remains less expensive than the Noticed Alternative Route. See Sudbury-Hudson at 178.

The record identifies the Project along the Primary Route as the least cost alternative, with the same cost for Project elements other than New Cable construction, for which the Primary Route would have an estimated installation cost of approximately $53.63 million compared to $56.03 million for the Noticed Alternative Route. Based on the Company's cost estimates, the Siting Board finds that the Primary Route is preferable to the Noticed Alternative Route with respect to cost.

F. Reliability

NEP maintains that the Project constructed along the Primary Route or along the Noticed

Alternative Route are each reliable means for replacing the Company's Existing Cable and meeting the identified need (Exh. NG-2, at 110). The Company represents, and the record demonstrates, that no meaningful reliability differences distinguish the Primary and Noticed Alternative Routes with respect to the Project (Company Brief at 78, citing Exh. NG-2, at 110).

Based on the evidence, the Siting Board concludes that a new 115 kV cable along either route would replace the Existing Cable in an equally reliable manner and meet the identified need (Exh. NG-2, at 110). The Siting Board therefore finds that the Primary Route and the Noticed Alternative Route are comparable with respect to reliability.

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

The Siting Board is charged with ensuring jurisdictional facilities approved for construction in the Commonwealth achieve an appropriate balance between environmental impacts, reliability, and cost. G.L. c. 164, § 69J. As discussed above, the Siting Board finds the Primary Route, including possible use of the Merrill Avenue Variation, preferable to the Noticed Alternative Route with respect to environmental impacts and cost, and comparable to the Noticed Alternative Route with respect to reliability.

The Siting Board therefore finds that the Primary Route is superior to the Notice Alternative Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Based on review of the record, the Siting Board finds that the Company provided sufficient information to allow the Siting Board to determine whether the Project has achieved a proper balance among cost, reliability, and environmental impacts. The Siting Board finds that with the implementation of the specified conditions and mitigation presented above, and compliance with all applicable 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.

VII. CONSISTENCY WITH POLICIES OF THE COMMONWEALTH

A. Standard of Review

G.L. c. 164, § 69J requires the Siting Board to determine whether plans for construction of the applicant's new facilities are consistent with current health, environmental protection, and resource use and development policies as adopted by the Commonwealth. Andrew-Dewar at 96-97; Sudbury-Hudson at 182; Needham-West Roxbury at 74.[94]

B. Analysis and Conclusions

1. Health Policies

The Restructuring Act noted the fundamental importance of reliable electric service to public health in declaring 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 and economy." St. 1997, c. 164. See also Town of Sudbury v. EFSB, 487 Mass. at 748, 756-757. Following this reasoning, a project that increases reliability in electric service should also be deemed to contribute to the health of the Commonwealth's citizens (Company Brief at 102). See, e.g., Andrew-Dewar at 99; Sudbury-Hudson at 188; Needham-West Roxbury at 74. In Section III above, the Siting Board found that the Project would improve the reliability of electric service in Massachusetts (see also, Exh. NG-2, at 130). Therefore, the Siting Board concludes that the increase in reliability from by the Project will result in health benefits to Commonwealth residents.

In addition, all design and construction activities for the Project will be in accordance with applicable government and industry standards, including: the National Electric Safety Code, the Massachusetts Code for the Installation and Maintenance of Electric Transmission Lines (220 CMR 125.00), and the Occupational Safety and Health Administration ("OSHA") regulations (29 CFR 1910) (Exh. CPC-1, at 1; Company Brief at 102-103). These standards have been put in place to protect the health and safety of the workers who will construct the Project in the Commonwealth. See Crooker v. OSHA, Case No. 07-2770.01A (1st Cir. 2008)

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94 Other than the Company, no party addressed this issue on brief.

("The mission of … OSHA is to assure as far as possible … safe and healthful working conditions") (internal quotation marks and citations omitted).

Accordingly, 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 current health policies of the Commonwealth.

2. Environmental Protection Policies

a. Removal of Hazardous Material

As noted above, failures of the Existing Cable have caused the dielectric fluid to leak into the environment. See Section III.B, supra. Dielectric fluid is included in the Massachusetts Oil and Hazardous Materials List, 310 CMR 40.1600, and is regulated by MassDEP (RR-EFSB-12). As part of the Project, the Company will remove both the land and submarine portions of the Existing Cable and will purge the dielectric fluid presently in the cable (Exhs. NG-2, at 121-125; EFSB-CM-16; Tr. 1, at 145-148). The Siting Board finds that removal of this hazardous material is consistent with the environmental protection policies of the commonwealth. See G.L. c. 21C, Massachusetts Hazardous Waste Management Act.

b. Consistency with Environmental Laws, Regulations, and Policies

The Siting Board will next address the Project's consistency with the Commonwealth's climate change and resiliency policies as articulated in statutes and policies.

The Global Warming Solutions Act ("GWSA"), enacted in August 2008, is a comprehensive statutory framework to address climate change in Massachusetts. St. 2008, c. 298.[95] The GWSA mandates that the Commonwealth reduce its greenhouse gas ("GHG")

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[95] G.L. c. 164, § 69J requires consistency with environmental protection policies of the Commonwealth, but does not explicitly recognize energy policies. However, the Siting Board accomplishes its statutory mandate to ensure reliable energy supply with minimum impact on the environment at the lowest possible cost within the context of current energy policies of the Commonwealth. G.L. c. 164, § 69H; see also, Andrew-Dewar at 100 n.96.

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). More recent policy developments, following the hearings and briefs in this proceeding, have both increased and accelerated the Commonwealth's GHG emissions reduction targets.[96]

On April 22, 2020, pursuant to the GWSA, the Secretary issued a "Determination of Statewide Emissions Limit for 2050" ("Determination"), which established a "net zero" level of statewide greenhouse gas emissions. The Determination defined net zero as "A level of statewide greenhouse gas emissions that is equal in quantity to the amount of carbon dioxide or its equivalent that is removed from the atmosphere and stored annually by, or attributable to, the Commonwealth; provided, however, that in no event shall the level of emissions be greater than a level that is 85 percent below the 1990 level" (Determination at 1).

The Secretary issued an "Interim Massachusetts Clean Energy and Climate Plan for 2030" on December 30, 2020 (the "Interim 2030 CECP") for public comment. In the 2030 Interim CECP, the Secretary set the 2030 statewide GHG emissions limit at 45 percent below 1990 levels. Also on December 30, 2020, Secretary issued the "Massachusetts 2050 Decarbonization Roadmap" ("2050 Roadmap"). Based on its analysis of a range of potential pathways, the 2050 Roadmap finds that the most cost-effective, low-risk pathways to net zero GHG emissions share core elements, including a balanced clean energy portfolio anchored by significant offshore wind resources, more interstate transmission, widespread electrification of transportation, building heat and hot water, and cost-effective replacement of equipment, infrastructure, and systems that use fossil fuels (2050 Roadmap at 21-26).

The 2050 Roadmap provides the Commonwealth with near- and long-term strategies to achieve the goal of reaching net zero emissions by 2050. The importance of additional electric transmission infrastructure in achieving net zero GHG emissions in a cost-effective manner is

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96 The Siting Board officially notices the following recent policies of the Commonwealth: "Determination of Statewide Emissions Limit for 2050" dated April 22, 2020; "Interim Clean Energy and Climate Plan for 2030 Interim" dated December 30, 2020; and "Massachusetts 2050 Decarbonization Roadmap" dated December 30, 2020. 980 CMR 1.06(7).

one of the key findings of the 2050 Roadmap: "Additional transmission increases access to, and the ability to share, additional low-cost clean energy resources across the Northeast, lowering costs overall" (2050 Roadmap at 15). The Roadmap underscores the importance of maintaining and enhancing transmission capability in Massachusetts to provide cost-effective, reliable service, and facilitate development and use of both local and regional clean and renewable resources (2050 Roadmap at 59, 63, 65). In addition, the 2050 Roadmap identifies a need for increasing electrification to achieve deep GHG emission reductions and envisions the widespread deployment of electric vehicles in place of gasoline and diesel engines, and of heat pump-based electrified heating and hot water systems in place of gas and oil furnaces, boilers and water-heating equipment (2050 Roadmap at 35, 44).

The GWSA also obligates administrative agencies to consider reasonably foreseeable climate change impacts and related effects when reviewing permit requests. G.L. c. 30, § 61. Pursuant to this obligation, the Siting Board finds that the transmission line portion of the Project would have minimal GHG emissions as it is a primarily underground transmission line and would not create direct emissions from a stationary source or indirect emissions from energy consumption. With respect to sea level rise and coastal inundation, this Decision imposes requirements on the Company regarding the Beverly #12 Substation and the proposed Waite Street Switching Station. Specifically, Condition D requires that all equipment at the Waite Street Switching Station must be located at an elevation of 15 feet NAVD88 (i.e., least three feet above the 500-year flood elevation). Condition D also requires NEP to install new equipment at the Beverly #12 Substation at a minimum elevation of 15 feet NAVD88 or implement equivalent flood resiliency measures. Condition E requires that the Company submit a Resiliency Analysis for the Beverly #12 Substation to the Board. Condition F requires the Company to periodically review projections of sea level rise and appropriate additional flood mitigation measures at the Beverly #12 Substation and Waite Street Switching Station. These measures would help protect the Beverly #12 Substation and the Waite Street Switching Station from sea level rise (Exhs. NG-2, at 111, 118; EFSB-W-13; EFSB-W-14; RR-EFSB-3). With regard to increasing use of renewable energy resources, by improving the reliability of the regional transmission system, the

Project will help facilitate the integration of these renewable energy resources (Exh. NG-2, at 131).

Accordingly, the Siting Board finds that the Project is consistent with the Commonwealth's climate change and resiliency policies as articulated in statutes and policies.

In Section VI.D.9, the Siting Board finds that the Project's land use, wetland and water resource, noise, visual, air, hazardous waste and safety, traffic, and magnetic field impacts have been minimized. See also Section VI.G. In addition to the Siting Board's conditions imposed in this Decision, the Company must also obtain all environmental approvals and permits required by federal, state, and local agencies; the Project must be constructed and operated according to those permits and approvals. In its petition, the Company lists three federal permits, twelve state permits or authorizations, and six local permits that it must obtain (Exh. NG-2, at 132-133). Almost all of these permits or authorizations relate to environmental issues.[97]

The Company filed an Environmental Notification Form ("ENF") pursuant to the Massachusetts Environmental Policy Act ("MEPA") (Exhs. CPC-1, at 1; EFSB-G-4). On March 8, 2019, the Secretary of Energy and Environmental Affairs ("Secretary") issued a MEPA Certificate stating that the Project does not require an Environmental Impact Report and that the Project's environmental impacts will be avoided, minimized, or mitigated to the extent practicable (Exhs. NG-2, app. 6-2; CPC-1, at 1-2; EFSB-G-4).

Accordingly, the Siting Board finds that obtaining the necessary permits and authorizations, compliance with MEPA, and compliance with Conditions D and E, indicate that the Project is consistent with the environmental protection policies of the Commonwealth.

c. Consistency with the Environmental Justice Policy

On March 26, 2021, Governor Baker signed An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy, St. 2021, c. 8 ("the Climate Roadmap Act").

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97 The exceptions to this general statement would include the required consultation with the Massachusetts Historical Commission, the State Highway Access Permit that must be obtained from the Massachusetts Department of Transportation, and the MBTA rail crossing permit (Exh. NG-2, at 132-133).

The Climate Act sets forth environmental justice principles to protect rights to a clean and healthy environment, regardless of race, color, income, class, handicap, gender identity, sexual orientation, national origin, ethnicity or ancestry, religious belief, or English language proficiency. To promote that goal, the Climate Roadmap Act requires the meaningful involvement of environmental justice populations and requires additional measures to improve public participation, such as providing translation services and public notices in English and any other language spoken by a significant number of the affected environmental justice population. St. 2021, c. 8, § 60. The environmental review process conducted by the MEPA Office will be revised to reflect additional focus on environmental justice populations.[98] EEA updated its prior Environmental Justice Policy, dated January 31, 2017 ("2017 EJ Policy"), on June 24, 2021 ("2021 EJ Policy"), consistent with the Climate Roadmap Act.[99,100] The EJ Policy applies to the Siting Board. See Winchester v. EFSB, 98 Mass.App.Ct. at 1101 ("Both the current version of the [Environmental Justice] policy, promulgated in 2017, and the prior version, which was in effect at the start of the original proceeding, apply to the siting board").

NEP acknowledged that, at the time it filed the Project with the Siting Board in 2019, portions of the Existing Cable removal would be located in areas defined as EJ neighborhoods under the 2017 EJ Policy; however, no part of the Primary or Noticed Alternative Routes passed

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98 The Climate Roadmap Act requires MEPA to promulgate regulations to implement sections of the Act within 180 days after the effective date of the Act. The Act further provides that new requirements relating to EIR near EJ Populations apply to new projects filed with MEPA after the effective date of these regulations. St. 2021, c. 8, §§ 102A, 102B.

99 The 2021 EJ Policy provides that Projects, such as the present one, that have filed an ENF prior to the issuance of said policy are not subject to the enhanced analysis or enhanced participation provisions of the updated policy. 2021 EJ Policy at 11 n.3. Provisions specific to the Siting Board under the 2021 EJ Policy (i.e., Section 20, Enhanced Public Participation and Analysis of Impacts and Mitigation Under the Energy Facilities Siting Board) did not change compared to the 2017 EJ Policy. See 2021 EJ Policy at 12; 2017 EJ Policy at 11.

100 https://www.mass.gov/doc/environmental-justice-policy6242021-update/download

through EJ neighborhoods (RR-EFSB-10; Company Brief at 104).[101] The Project did not exceed an environmental notification form threshold for air, solid or hazardous waste, or wastewater and sewage sludge treatment and disposal and therefore did not trigger enhanced public participation or enhanced analysis of impacts and mitigation under the 2017 EJ Policy, which was in effect when the Project was filed with the Siting Board and when the Project underwent MEPA review (see Company Brief at 104-105; RR-EFSB-10).

In addition, consistent with established Siting Board practice and the Commonwealth's Language Access Policy, the Siting Board staff examined the linguistic composition of the affected Project area, and determined that additional outreach, in languages other than English, was neither required, nor specifically requested by members of the public.

3. Consistency with Resource Use and Development Policies

In 2007, Governor Patrick established Sustainable Development Principles pursuant to the Commonwealth's Smart Growth/Smart Energy Policy which had been produced by the Office of Energy and Environmental Affairs ("EEA") (Exh. NG-2, at 131).[102] These principles include: (1) supporting the revitalization of city centers and neighborhoods by promoting development that is compact and conserves land; and (2) encouraging remediation and reuse of existing sites, structures, and infrastructure rather than new construction in undeveloped areas (id.; Company Brief at 106).

Construction of the Project would further these principles. The Project would be built primarily within existing roadways; and, therefore, construction would not require new rights of way. In addition, the Project would continue to use the Beverly #12 and the East Beverly #51

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101 Consistent with the Climate Roadmap Act, the 2021 EJ Policy includes a revised definition for EJ populations. Siting Board staff note that, using EEA's EJ Viewer mapping application, which reflects the revised definition for EJ populations and uses American Community Survey 2015-2019 five-year-estimates for demographic data, it appears that the Primary and Noticed Alternative Routes both pass through areas with EJ Populations.

102 See https://www.mass.gov/topics/the-smart-growth-smart-energy-toolkit. Click on Smart Growth/Smart Energy Background Information.

substations. Furthermore, the New Cable would cross the Danvers River on the underside of the existing Veterans Memorial Bridge. Finally, the route of the New Cable would remain entirely within Salem and Beverly. Consequently, the Project would reuse existing sites, infrastructure, and rights of way. Consequently, the Siting Board finds that construction of the Project would be consistent with the resource use and development policies of the Commonwealth.

C. Conclusion

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 health, environmental protection, and resource use and development policies as adopted by the Commonwealth.

VIII. INDIVIDUAL ZONING EXEMPTIONS

Pursuant to G.L. c. 40A, § 3, the Company filed a petition ("Zoning Petition") seeking individual and comprehensive zoning exemptions from the zoning ordinances of the cities of Salem and Beverly for the Company's Project.

A. Standard of Review

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

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

Thus, a petitioner seeking exemption from a local zoning bylaw under G.L. c. 40A, § 3 must meet three criteria.[103] First, the petitioner must qualify as a public service corporation.

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[103] G.L. c. 40A, § 3, applies to the Department. The Department refers zoning exemption cases to the Siting Board for hearing and decision pursuant to G.L. c. 25, § 4. In accordance with G.L. c. 164, § 69H, when deciding cases under a Department statute the

Save the Bay, Inc. v. Department of Public Utilities, 366 Mass. 667, 677 (1975) ("Save the Bay"). Second, the petitioner must demonstrate that its present or proposed use of the land or structure is reasonably necessary for the public convenience or welfare. Sudbury-Hudson at 193; Vineyard Wind LLC, EFSB 17-05/D.P.U. 18-18/18-19, at 132 (2019) ("Vineyard Wind"); NRG Canal 3 Development LLC, EFSB 15-06/D.P.U. 15-180, at 140-141 (2017) ("NRG"). Finally, the petitioner must establish that it requires exemption from the zoning ordinance or bylaw. Sudbury-Hudson at 193; NRG at 141; Tennessee Gas Pipeline Company, D.T.E. 01-57, at 4 (2002).

Additionally, the Siting Board favors the resolution of local issues on a local level whenever possible, to reduce concern regarding any intrusion on home rule. The Siting Board believes that the most effective approach for doing so is for a petitioner to consult with local officials regarding its project before seeking zoning exemptions pursuant to G.L. c. 40A, § 3. Sudbury-Hudson at 193; Vineyard Wind at 132; Russell Biomass LLC, EFSB 07-4/D.P.U. 07-35/07-36, at 61-62 (2009) ("Russell"). Thus, the Siting Board encourages petitioners to consult with local officials, and in some circumstances, to apply for local zoning permits, before seeking zoning exemptions from the Department under G.L. c. 40A, § 3. Sudbury-Hudson at 193; Vineyard Wind at 132; Russell at 62.

B. Public Service Corporation

1. 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 SJC 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

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Siting Board applies Department and Board standards "in a consistent manner." Thus, the Siting Board and the Department implement G.L. c. 40A, § 3, using consistent standards of review, and this Decision cites to both Siting Board decisions and Department orders interpreting G.L. c. 40A, § 3. On October 28, 2019, the Chair of the Department referred the Company's Zoning Petition to the Siting Board for review and decision pursuant to G.L. c. 25, § 4.

> general public which could not be furnished through the ordinary channels of private business; whether the corporation is subject to the requisite degree of governmental control and regulation; and the nature of the public benefit to be derived from the service provided.

Save the Bay, 366 Mass. at 680; Sudbury-Hudson at 194; Berkshire Power Development, Inc. D.P.U. 96-104, at 26-36 (1997) ("Berkshire Power").[104]

2. Analysis and Finding

NEP is a Massachusetts corporation that is an electric company as defined by G.L. c. 164, § 1 and, as such, qualifies as a public service corporation. Woburn-Wakefield at 141; New England Power Company d/b/a National Grid, EFSB 13-2/D.P.U. 13-151/13-152, at 93 (2014) ("Salem Cables").

C. Public Convenience or Welfare

1. 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 686; Town of Truro at 411. Specifically, the Department is empowered and required to undertake "a broad and balanced consideration of all aspects of the

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[104] The Department interprets this list not as a test, but rather, as guidance to ensure that the intent of G.L. c. 40A, § 3, will 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. Berkshire Power at 30; Save the Bay, 366 Mass. at 680; Sudbury-Hudson at 194 n.172; Town of Truro v. Department of Public Utilities, 365 Mass. 407, 410 (1974) ("Town of Truro"); Exelon West Medway at 135 n.117; New England Power Company d/b/a National Grid, D.P.U. 15-44/15-45 at 5-6 (2016) ("MVRP"). 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; MVRP at 6. 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. Berkshire Power at 31; MVRP at 6; NSTAR Electric Company, D.P.U. 15-02 (2015) at 4-5.

general public interest and welfare and not merely [make an] examination of the local and individual interests which might be affected." New York Central Railroad v. Department of Public Utilities, 347 Mass. 586, 592 (1964) ("NY Central Railroad"). When reviewing a petition for a zoning exemption under G.L. c. 40A, § 3, the Department is empowered and required to consider the public effects of the requested exemption in the State as a whole and upon the territory served by the applicant. Save the Bay at 685; NY Central Railroad at 592.

Therefore, when making a determination as to whether a petitioner's present or proposed use is reasonably necessary for the public convenience or welfare, the Department examines: (1) the need for, or public benefits of, the present or proposed use; (2) the present or proposed use and any alternatives or alternative sites identified;[105] and (3) the environmental impacts or any other impacts of the present or proposed use. The Department then balances the interests of the general public against the local interest and determines whether the present or proposed use of the land or structures is reasonably necessary for the convenience or welfare of the public. Sudbury-Hudson at 195; Vineyard Wind at 136-137; Tennessee Gas Company, D.T.E. 98-33, at 3 (1998).

2. Analysis and Findings

The Company asserts that the Project is needed primarily for two reasons. First, the Project will maintain the integrity and reliability of the Company's electric system by replacing the Existing Cable, which has reached the end of its useful life (Exh. NG-3, at 11; Company Brief at 111). Second, the Project will introduce a second source of power to the Beverly #12

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105 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.

Substation, which will remedy existing distribution planning criteria violations and the potential for thermal overloads (Exh. NG-4, at 11; Company Brief at 111).

With respect to the need for, or public benefits of, the Project, the Siting Board found in Section III that additional energy resources are needed for reliability in the Project area. In Section IV the Siting Board analyzed different project approaches including transmission and non-transmission alternatives, that the Company might use to meet the reliability need and concluded that the proposed approach is superior to other approaches. The Siting Board also reviewed the Company's route selection process in Section V and has found that the Company demonstrated that it: (1) examined a reasonable range of practical siting alternatives and (2) identified locations which would minimize cost and environmental impacts while ensuring a reliable energy supply. The Siting Board also compared the impacts of the Primary Route to the Noticed Alternative Route. Based on that review, the Siting Board 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 VI.D, the Siting Board evaluated the environmental impacts of the Project and found that the environmental impacts of the proposed Project would be minimized with the implementation of mitigation measures directed by the Siting Board and described in this Decision and compliance with all local, state, and federal requirements. Based on the foregoing, the Siting Board finds that the need for the Project on balance outweighs identifiable adverse local impacts associated with the construction and operation of the Project. Accordingly, the Siting Board finds that the proposed Project is reasonably necessary for the convenience or welfare of the public.

D. Individual Exemption Required

1. Standard of Review

In determining whether an exemption from a particular provision of a zoning bylaw is "required" for purposes of G.L. c. 40A, § 3, the Department determines whether the exemption is necessary to allow construction or operation of the petitioner's project. Sudbury-Hudson at 196; Vineyard Wind at 139; Woburn Wakefield at 143-144; Tennessee Gas Company, D.P.U. 92-261,

at 20-21 (1993). The Petitioner bears the burden to identify the individual zoning provisions applicable to the project and establish on the record 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 [G.L.] c. 40A, § 3 will identify fully and in a timely manner all exemptions that are necessary for the corporation to proceed with its proposed activities, so that the Department is provided ample opportunity to investigate the need for the required exemptions.

Sudbury-Hudson at 197; Vineyard Wind at 139; New York Cellular Geographic Service Area, Inc., D.P.U. 94-44, at 18 (1995).

2. Description

a. Exemptions

The Company states that individual zoning exemptions are required for construction and operation of the Project in Salem (for the Waite Street Switching Station) and Beverly (for upgrades to the Beverly #12 Substation) (Exhs. EFSB-Z-4; EFSB-Z-6; Company Brief at 113, 117). Tables 12 and 13 below summarize: (1) each of the specific provisions of the Salem and Beverly zoning ordinances from which the Company seeks exemptions: (2) the relief available (if any) under the respective ordinances; and (3) the Company's argument as to why it cannot comply with the identified zoning provision and/or why the available zoning relief is inadequate.

Table 12. Requested Individual Exemptions from the Salem Zoning Ordinance – Summary of the Company's Position.

Section of the Salem Zoning Ordinance	Available Relief	Why Exemption Is Required: Company's Position
Allowed Uses Section 3.1	Special Permit	The Waite Street Switching Station would likely constitute an "essential service" pursuant to section 3.1 of the zoning ordinances, and that it would be located in the Business and Wholesale Automotive ("B4") zoning district. Section 3.1 of the zoning ordinance allows essential services in the B4 district only upon issuance of a special permit. The Company argues that some of the standards for granting a special permit are subjective, that such a grant is discretionary, and that a

Section of the Salem Zoning Ordinance	Available Relief	Why Exemption Is Required: Company's Position
		special permit could contain burdensome or restrictive conditions. There is a need for timely construction of the Project that could be thwarted by any delay in issuing a special permit or any appeal thereof.
Definition of Essential Service Section 10	None	The Company asserts that if the Waite Street Switching Station were deemed to fall outside the definition of an essential service, as set forth in Section 10 of the zoning ordinance, then construction of the Waite Street Switching Station would be prohibited because the Zoning Board of Appeals lacks the authority to grant use variances.
Flood Hazardous Overlay District Section 8.1.4	Special Permit	The Waite Street Switching Station would be located in the Flood Hazardous Overlay District ("FHOD"). According to the Company, the Salem Inspectional Services Director has confirmed that the Company must obtain a floodplain special permit, pursuant to the provisions of section 8.1.4 of the zoning ordinance, for the Waite Street Switching Station. The Company argues that some of the standards for granting a special permit are subjective, that such a grant is discretionary, and that a special permit could contain burdensome or restrictive conditions. These conditions, the Company argues, could impede the Company from constructing the switching station in accordance with applicable state and industry standards.

Source: Exhs. EFSB-Z-4; EFSB-Z-8; EFSB-Z-9; EFSB-Z-10; NG-4 at 16; NG-4, exh. 3, at 2; NG-4, exh. 3, att. A, B; Company Brief at 113-117.

Table 13. Requested Individual Exemptions from the Beverly Zoning Ordinance – Summary of the Company's Position.

Section of the Beverly Zoning Ordinance	Available Relief	Why Exemption is Required: Company's Position
Section 300-82	Special Permit for the alteration, expansion or extension of pre-existing nonconforming use	The Beverly #12 Substation is located in an Industrial Zoning District ("IG"). This Substation has been in continuous use since the 1930s and, the Company asserts, most likely qualifies as a pre-existing nonconforming use. Section 300-82 provides that a nonconforming use may not be altered, expanded, or extended without a special permit. The Company argues that some of the standards for granting a special permit are subjective, that such a grant is discretionary, and that a special permit could contain burdensome or restrictive conditions that could impede the Company from constructing the Substation in

Section of the Beverly Zoning Ordinance	Available Relief	Why Exemption is Required: Company's Position
		accordance with applicable state and industry standards. The Company also argues that obtaining the permit, and the risk of appeal, could cause delay in construction. Such delay would be contrary to the public interest because of the need for timely construction of the Project.
Sections 300-43.C(1)(j) and 300-91	Special Permit for Essential Public Services	If Beverly #12 Substation were deemed not to constitute a pre-existing nonconforming use, then the use of this Substation (including improvements made as part of the Project) in the IG zoning district would be governed by Section 300-43.C(1)(j). Said provision would require the grant of a special permit, pursuant to Section 300-91, in order for the Substation to be improved and to continue in use. The Company argues that some of the standards for granting a special permit are subjective, that such a grant is discretionary, and that a special permit could contain burdensome or restrictive conditions that could impede the Company from constructing the Substation in accordance with applicable state and industry standards. The Company also argues that obtaining the permit, and the risk of appeal, could cause delay in construction. Such delay would be contrary to the public interest because of the need for timely construction of the Project.
Section 300-48.D	Floodplain Development Permit	The Beverly #12 Substation is also located in the Floodplain Overlay District ("FOD"). The FOD is established by and regulated pursuant to Section 300-48D. The Beverly Municipal Inspector confirmed the Company's understanding that the improvements to the Beverly #12 Substation would require a floodplain development permit ("FDA"). The zoning ordinance does not provide any standards for the issuance of an FDA, and such issuance is subject to review by four separate municipal agencies. The Company argues that an FDA could contain burdensome or restrictive conditions that could impede the Company from constructing the Substation in accordance with applicable state and industry standards. The Company also argues that obtaining the FDA, and the risk of appeal, could cause delay in construction. Such delay would be contrary to the public interest because of the need for timely construction of the Project.

Source: Exhs. EFSB-Z-6; EFSB-Z-8; EFSB-Z-12; NG-4, at 18-20; NG-4, exh. 3, att. C, D; Company Brief at 117-121.

b. Consultation with Municipalities

The Company held a series of 14 meetings during 2018 and 2019 with various Beverly and Salem municipal officials as well as representatives of MassDOT and the MBTA (Exh. NG-2, at 8). As a result of these discussions, the Company has entered into Memorandums of Agreement with both Beverly and Salem (Exhs. EFSB-CM-15(S1)(1); EFSB-CM-15(S2)(1)).[106] These memorandums address mitigation of impacts from construction of the Project in each city (Exhs. EFSB-CM-15(S1)(1); EFSB-CM-15(S2)(1); Company Brief at 23).

In addition, the Company has also engaged in outreach to the residents. For example, the Company has held two open houses (Exh. NG-2, at 8-9). The first open house was held on November 7, 2018, at the Beverly High School (id. at 8). Direct invitations were sent to 2,626 addresses in both Beverly and Salem (id.). In identifying these addresses, the Company used a 500-foot radius to capture all abutters along both the Primary Route and the Noticed Alternative Route (id.). The second open house was held in Salem, at the Carlton Innovation School, on February 5, 2019 (id. at 9). Direct invitations were sent to 443 addresses in Salem, comprising all abutters within one-quarter mile of: (1) the proposed Waite Street Switching Station; (2) the Primary Route in Salem; and (3) the Noticed Alternative Route in Salem (id.).

In addition, the Company set up a dedicated website, project hotline, and a project email to provide information to the public and to facilitate communication (Exh. NG-2, at 9). The website provides basic Project information, maps, updates, and contact resources (id.). The Company promises to keep the website up to date during the duration of the Project (id.). The project hotline number and the project email address are listed on all Project outreach materials,

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106 The Siting Board notes that a Memorandum of Agreement is a private contract between two parties. See Woburn-Wakefield at 94 (interpreting analogous Host Community Agreement). The Board traditionally does not incorporate a Memorandum of Agreement into a decision nor does the Board enforce the terms of such a memorandum. Woburn-Wakefield at 94. See Town of Hopkinton v. Department of Public Utilities, 97 Mass.App.Ct. 1102 (2020) (unpublished opinion). See also NRG Canal 3 Development LLC, EFSB 15-06/D.P.U. 15-180, at 5 (2017); Exelon West Medway, LLC and Exelon West Medway II, LLC, EFSB 15-01/D.P.U. 15-25, at 6 (2016).

including fact sheets, subsequent mailings, documents issued in as a part of community events, and on the dedicated website (id.).[107]

3. Analysis and Findings on Individual Zoning Exemptions

In Tables 12 and 13 above, the Company has identified the individual provisions of the Salem and Beverly zoning ordinances from which it seeks exemptions in order to minimize delay in the construction and operation of the Project. The record shows that without these exemptions the Company would need to seek special permits and a floodplain development permit. Furthermore, as mentioned above, if the Waite Street Switching Station were deemed not to constitute an "essential service," then no zoning relief would be available, because the Salem Zoning Board of Appeals lacks the authority to grant use variances. In that case, absent an exemption, the Switching Station and, consequently, the Project could not be built.

The Siting Board concurs with the Company's position that the standards for granting a special permit are subjective, the grant is discretionary, and a special permit could contain burdensome or restrictive conditions, which could impair the Company's ability to construct the Project in accordance with applicable state and industry standards.[108] The concerns regarding special permits apply equally to the grant of an FDA. The Siting Board also agrees that there is the potential for delay in obtaining a special permit or an FDA, and that such a delay would be contrary to the public interest because there is a need for the timely construction of the Project. The Siting Board finds that the specifically named zoning exemptions in Tables 12 and 13 are required for the construction of the Project within the meaning of G.L. c. 40A, § 3.

The record also shows that the Company engaged in significant outreach to both Beverly and Salem. This outreach has borne fruit in the execution of memorandums of agreement between the Company and both municipalities. The record also shows that the Company has,

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107 No party addressed the zoning exemptions or municipal outreach in their brief.

108 As an example of such a burdensome condition, the Company states that a special permit could impose yard setback requirements applicable to the substations that would be inconsistent with regulatory and industry standards "pertaining to the safety, security, and operation of the electric substation facilities" (Exh. EFSB-Z-9).

and will continue to, engage in significant outreach to the residents of Salem and Beverly. Based on the record in this proceeding, the Siting Board finds that the Company has engaged in good-faith consultations with Beverly and Salem regarding the Project consistent with the standard articulated in Russell and followed in Vineyard Wind and Sudbury-Hudson.

E. Conclusion on Request for Individual Zoning Exemptions

The Siting Board has found above that: (1) the Company is a public service corporation; (2) the proposed use is reasonably necessary for the public convenience or welfare; and (3) the specifically named zoning exemptions in Tables 12 and 13 are required for the construction of the Project within the meaning of G.L. c. 40A, § 3. Additionally, we find that the Company engaged in good faith consultation with Salem and Beverly. Accordingly, the Siting Board grants the Company's request for the individual zoning exemptions listed above in Tables 12 and 13.

IX. COMPREHENSIVE ZONING EXEMPTION

A. Standard of Review

The Company requests comprehensive zoning exemptions from the zoning ordinances of the cities of Salem and Beverly for the Company's Project (Exh. NG-4; Company Brief at 1, 121-125). The Siting Board grants 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. Sudbury-Hudson at 215; Vineyard Wind at 153; East Eagle at 161-162.

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 contributes to a reliable energy supply for the Commonwealth; (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 communities do not oppose the issuance of the comprehensive exemption. Sudbury-Hudson at 215; Vineyard Wind at 153; Woburn-Wakefield at 150. See Town of Hopkinton v. DPU, 97 Mass.App.Ct. 1102 (2020) (unpublished opinion).

B. Company Position

The Company argues that a comprehensive zoning exemption is necessary in this case because, "the Project is needed in the immediate time frame to continue reliable transmission service to nearly 50,000 electric customers in the Beverly, Cape Ann area" (Company Brief at 123, citing Exhs. NG-4, at 23; EFSB-Z-1; Tr. 1, at 164-166). Furthermore, the Company asserts that zoning ordinances are rarely written with energy infrastructure facilities in mind (Company Brief at 122). As a result, the Company asserts, three problems frequently arise: (1) local zoning ordinances often conflict with "state and industry safety and engineering standards"; (2) the zoning ordinances can be difficult to apply to energy infrastructures; (3) the zoning process can result in burdensome conditions being applied to zoning relief (id.).

While these problems are addressed to some extent by the grant of individual exemptions, the Company argues that there are two possible areas of conflict that fall outside the grant of individual exemptions. First, a particular zoning provision may originally be deemed inapplicable to the Project, and therefore not included as a requested individual exemption, only later to be deemed applicable (Company Brief at 123). Second, sometime prior to construction a new zoning provision applicable to the Project, but not included in the individual exemptions sought in this petition, might be adopted (id. at 123-124, citing Exh. NG-4, at 23; EFSB-Z-15; Tr. 2, at 177-178; see also Exh. EFSB-CM-15(S1)(1)). This last point, the Company argues, is particularly relevant to Beverly because that city is considering the creation of a new overlay district that would include the Beverly #12 Substation property (Company Brief at 124, citing Exhs. NG-4, at 23; NG-4, exh. 3, Att. D; EFSB-Z-15).

The Company also argues that Beverly and Salem support the Project and do not object to the grant of comprehensive zoning relief (Company Brief at 124, citing Exh. NG-4, exh. 4, Att. A - D). Furthermore, the Company states that a comprehensive exemption would enable it to quickly address and implement design changes where necessary (Company Brief at 125).

C. Analysis and Findings on Comprehensive Zoning Exemption

General Laws c. 40A, § 3 provides the Department with the authority to ensure that local interests do not prevent construction of needed facilities that serve the public interest. "The zoning exemption available under G.L. c. 40A, § 3, is intended to assure utilities' ability to carry out their obligation to serve the public when this duty conflicts with local interests." Planning Bd. of Braintree v. Department of Public Utilities, 420 Mass. 22, 27 (1995) ("Braintree").

Compared to the grant of individual zoning exemptions, which is tailored to meet the construction requirements of a particular project, the grant of a comprehensive zoning exemption serves to nullify a municipality's zoning code in its entirety with respect to the project under review. Thus, compared to the grant of individual zoning exemptions, a comprehensive zoning exemption constitutes a broader incursion upon municipal home rule authority. In the absence of a showing that substantial public harm may be avoided by granting a comprehensive exemption, the granting of such extraordinary relief is not justified. NSTAR Electric Company, D.P.U. 13-126/13-127, at 38-39 (2014); NSTAR Electric Company, D.P.U. 11-80, at 44 (2012).

Department and Siting Board cases that have considered and granted comprehensive exemptions have typically involved projects that contribute to a reliable supply of energy, were time-sensitive, and often, but not necessarily, dealt with the zoning ordinances of multiple municipalities where conflicting provisions or interpretations could arise. See e.g., Woburn-Wakefield at 150-151; Walpole-Holbrook at 98-100.

These three factors are present here. As discussed in Section III above, the record in this proceeding shows that the Project is needed to maintain the reliability of the transmission grid in the Beverly, Cape Ann area. The record also shows that the need is immediate. As long as the Project remains unbuilt, there is a danger of outages and that MODF will leak from the Existing Cable. As noted above, MODF is included in the Massachusetts Oil and Hazardous Materials List, 310 CMR 40.1600, and is regulated by MassDEP (Exh. RR-EFSB-12). Thus, construction of the Project both contributes to a reliable energy supply and is also time-sensitive.

In addition, the Siting Board has found, in Section VIII.D.2.b above, that the Company has engaged in good-faith consultations with numerous Beverly and Salem officials. As a result,

the Company has entered into memorandums of understanding with both cities, and both cities have indicated support. In Section VI.D, the Siting Board has incorporated specific conditions with regard to the construction and operation of the Project, which seek to protect local interests with regard to environmental impacts. Under these circumstances, the Siting Board finds that delay in the completion of the Project would likely cause substantial public harm and that grant of a comprehensive exemption from the zoning ordinances of Salem and Beverly is warranted.

In granting this relief, however, the Siting Board notes that the Company must inform the Siting Board of any changes to the Project other than minor variations so that the Board may decide whether or not to inquire further into a particular issue. This condition ensures that all intervenors and interested persons receive notice of any potential modification proposed by the Company, and that they have the opportunity to comment on the impact of such modifications.

X. ANALYSIS UNDER G.L. C. 164, § 72

A. Standard of Review

General Laws, c. 164, § 72 requires, in relevant part, that an electric company seeking approval to construct a transmission line must file with the Department a petition for: authority to construct and use ... a line for the transmission of electricity for distribution in some definite area or for supplying electricity to itself or to another electric Company or to a municipal lighting plant for distribution and sale ... and shall represent that such line will or does serve the public convenience and is consistent with the public interest. The [D]epartment, after notice and a public hearing in one or more of the towns affected, may determine that said line is necessary for the purpose alleged, and will serve the public convenience and is consistent with the public interest.[109]

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

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

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

In evaluating petitions filed under G.L. c. 164, § 72, the Department examines: (1) the need for, or public benefits of, the present or proposed use; (2) the environmental impacts or any other impacts of the present or proposed use; and (3) the present or proposed use and any alternatives identified. Andrew-Dewar at 105; Sudbury-Hudson at 219; East Eagle at 164. 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. Save the Bay, Inc. v. Department of Public Utilities, 266 Mass. 667, 679 n. 10 (1975); New England Power Company d/b/a National Grid, D.P.U. 19-16 (2020).

B. Company Position

The Company is the only party to address the issue of Section 72 findings in its brief (Company Brief at 107-108). The Company asserts that the findings that would support the Board's approval of the Project pursuant to Section 69J would also support Project approval pursuant to Section 72 (Company Brief at 108). These findings are that: the Project would contribute to a necessary supply of energy to the Commonwealth; it would do so with a minimum impact on the environment and at the lowest possible cost; and there is a need for, and public benefits from, construction of the Project (id.).

C. Analysis and Findings

In Sections III through VI above, the Siting Board examined: (1) the need for, and public benefits of, the proposed Project; (2) the environmental impacts of the proposed Project; and (3) any identified alternatives. The Siting Board concluded that the Project is needed, and that construction of the Project would achieve an appropriate balance among environmental impacts, reliability, and costs. Accordingly, with the implementation of the specified mitigation measures proposed by the Company and the conditions set forth by the Siting Board in Section XII below, the Siting Board finds pursuant to G.L. c. 164, § 72, that the Project is necessary for the purpose

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

XI. 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" ("Section 61 Findings"). G.L. c. 30, § 61. Pursuant to 301 CMR 11.01(4), Section 61 Findings are necessary when an EIR is submitted to the Secretary of Energy and Environmental Affairs and Section 61 Findings should be based on such EIR. Where an EIR is not required, Section 61 Findings are not necessary. 301 CMR 11.01(4).

As noted above in Section VII.B.2.b, the Company filed an ENF pursuant to MEPA (Exhs. CPC-1, at 1; EFSB-G-4). On March 8, 2019, the Secretary issued a MEPA Certificate stating that the Project does not require an EIR and that the Project's environmental impacts will be avoided, minimized, or mitigated to the extent practicable (Exhs. NG-2, Appendix 6-2; CPC-1, at 1-2; EFSB-G-4). Consequently, Section 61 Findings are not necessary in this proceeding.

XII. DECISION

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

In Section III, above, the Siting Board finds that additional energy resources are needed to maintain a reliable supply of electricity in the Beverly/Cape Ann Area.

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

In Section V, above, the Siting Board finds that the Company has: (1) developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner that ensures that they have not overlooked or eliminated any routes that are on balance clearly superior to the proposed Project; and (2) identified a range of 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 and that its proposed facilities are sited in locations that minimize cost and environmental impacts while ensuring a reliable supply.

In Section VI, above, the Siting Board finds that the Primary Route is superior to the Notice Alternative Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

In Section VI, above, the Siting Board finds that the Company provided sufficient information to allow the Siting Board to determine whether the Project has achieved a proper balance among cost, reliability, and environmental impacts. The Siting Board finds that with the implementation of the specified conditions and mitigation presented above, and compliance with all applicable 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.

In Section VII, above, the Siting Board finds that, subject to the specified mitigation and conditions set forth in this Decision, the Company's plans for construction of the Project are consistent with the current health, environmental protection, and resource use and development policies as adopted by the Commonwealth.

In addition, the Siting Board finds, pursuant to G.L. c. 164, § 72, that the Project 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 H. Accordingly, the Siting Board approves the Company's Section 72 petition.

In addition, the Siting Board finds, 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 the Company's Petition for an exemption from certain individual provisions of the zoning ordinances of the cities of Salem and Beverly. In addition, the Siting Board finds that delay in the completion of the Project would likely cause substantial public harm and that the grant of comprehensive exemptions from the zoning bylaws of the cities of Salem and Beverly is warranted. Accordingly, the Siting Board approves the Company's Petition for comprehensive exemptions from the provisions of the zoning ordinances of the cities of Salem and Beverly.

Accordingly, the Siting Board approves pursuant to G.L. c. 164, § 69J, the Company's Petition to construct the Project using the Primary Route, as described herein, subject to the following Conditions A through O.

A. The Siting Board directs the Company to comply with all applicable federal, state, and local laws, regulations, and ordinances from which the Company has not received an exemption. The Company shall be responsible for ensuring such compliance by its contractors, subcontractors, or other agents.

B. 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 the Company to file semi-annual compliance reports with the Siting Board starting within 180 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. The Siting Board also directs the Company to notify the Board of significant project cost increase above the ranges referenced in this Decision, pursuant to the Company's obligation to notify the Board of any changes other than minor variations to the proposal.

C. 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 compliance.

D. The Siting Board directs NEP to install new equipment at the Beverly #12 Substation and equipment at the Waite Street Switching Station at a minimum elevation of 15 feet NAVD88 (i.e., least three feet above the 500-year flood elevation). The Siting Board further directs NEP to install new equipment at the Beverly #12 Substation at a minimum elevation of 15 feet NAVD88 or implement equivalent flood resiliency measures.

E. The Siting Board directs the Company to undertake a feasibility/planning-level analysis ("Resiliency Analysis") that describes the environmental impacts, costs, and reliability of implementing measures that would achieve flood mitigation resilience outcomes equivalent to placing new equipment at an elevation of 15 feet NAVD88 (i.e., the 500-year flood plus three feet of sea level rise through the year 2070). The Resiliency Analysis shall consider and compare measures including, but not limited to: (1) raising new equipment proposed for the Beverly #12 Substation to an elevation of at least 15 feet NAVD88; and (2) other protective measures (e.g., levees, floodwalls, living shorelines) that would protect the entire Beverly #12 Substation. The Resiliency Analysis shall also assess the potential for any detrimental effects on parcels neighboring the Beverly #12 Substation as a result of flood protection measures proposed for the shoreline of the Bass River. NEP shall submit the Resiliency Analysis to the Board no later than 90 days prior to commencing construction at the Beverly #12 Substation. The Siting Board will expeditiously review the Resiliency Analysis. The Siting Board delegates final determination to the Chair as to whether any of the additional flood mitigation measures are necessary and appropriate and shall be implemented. This provision applies only to construction at or modification of the Beverly #12 Substation, exclusive of the New Cable and related structures.

F. The Siting Board directs that the Company shall every five years from the date of operation review municipal, state, and federal projections, as applicable, of sea level rise and submit a report to the Siting Board analyzing the necessity, appropriateness, and cost of implementing additional flood mitigation measures at the Beverly #12 Substation and the Waite Street Switching Station to protect the facilities from inundation. In preparing each report the Company shall consult with agencies including, but not limited to, the Cities of Salem and Beverly, Office of Coastal Zone Management, Massachusetts Emergency Management Agency, and the Department of Environmental Protection. The Siting Board will review each report and determine whether any of the additional flood mitigation measures are necessary and appropriate and shall be implemented, provided that any mitigation measures shall not have any detrimental effects on neighboring parcels, at the Beverly #12 Substation or the Waite Street Switching Station.

G. The Siting Board directs NEP to use portable noise barriers wherever practicable to further mitigate the noise impacts of removing the Existing Cable from the MBTA ROW on abutting residential areas.

H. The Siting Board directs the Company to limit construction to Monday through Friday during the hours between 7:00 a.m. and 4:30 p.m. in Beverly, and 8:00 a.m. to 5:00 p.m. in Salem, except by request of the Cities of Beverly or Salem or of an agency with oversight of operations potentially affected by the Project, such as the MBTA. Work requiring longer continuous duration than normal construction hours allow, such as cable splicing, is exempted from this condition.

The Siting Board also directs the Company to coordinate with the Cities of Beverly and Salem, and the MBTA or other jurisdictional agencies, to determine which areas, such as schools, where construction hour limitations may be appropriate to mitigate noise or other concerns.

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

I. The Siting Board directs NEP, in addition to using newer, lower-noise-generating equipment, to also use portable noise barriers to mitigate the noise impact of nighttime cable splicing operations that occur within 75 feet of a residential structure.

J. The Siting Board directs the Company to investigate means to reduce Project sound levels at the residence on Marshall Court, immediately south of the Beverly #12 Substation; the Company shall report to the Siting Board prior to construction any actions to be taken to effect such noise mitigation.

K. The Siting Board directs the Company to consider use of lighting measures in conjunction with removal of the Existing Cable that minimize dispersion onto adjacent land uses.

L. The Siting Board directs NEP to modify its TMPs to address the Merrill Avenue Variation in the event the Company needs to avoid Pierce Avenue.

M. The Siting Board directs the Company to arrange for off-peak delivery of Project equipment and materials and to develop TMPs for the Project, as the Company indicates it will do. The Siting Board directs the Company to submit a copy of final TMPs to the Siting Board when available, but no less than two weeks prior to the commencement of construction, and to publish the TMPs on the Company's Project website to ensure availability of traffic-related planning information for the Project area.

N. The Siting Board directs NEP to modify its TMPs to address the Merrill Avenue Variation in the event the Company needs to avoid Pierce Avenue.

O. The Siting Board directs the Company to develop a comprehensive outreach plan for the Project in consultation with the Cities of Salem and Beverly, and submit it to the Siting Board for review prior to the start of construction. The outreach plan

> shall describe the procedures to be used to notify the public about: (1) the scheduled start, duration, and hours of construction in particular areas; (2) the methods of construction that will be used in particular areas (including any use of nighttime construction); and (3) anticipated street closures and detours. The outreach plan shall use plain language, include detailed maps, and shall also include information on complaint and response procedures; Project contact information; the availability of web-based project information; and protocols for notifying the schools of upcoming construction. The Company shall translate the outreach plan into appropriate languages, as necessary for the Project area.

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 the Company, and 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. The Company 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 to the Executive Office of Energy and Environmental Affairs and the Company shall serve a copy of this Decision on the City of Salem Mayor and City Council, the City of Beverly Mayor and City Council, and the planning boards and zoning boards of appeals in these municipalities. The Company shall certify to the Secretary of the Department within ten business days of issuance that such service has been made.

Robert J. Shea

Robert J. Shea, Esq.
Presiding Officer

Dated this 8th day of October 2021

APPROVED by a vote of the Energy Facilities Siting Board at its meeting on [October 6, 2021], by the members present and voting. Voting for the Tentative Decision as amended: Kathleen A. Theoharides, Secretary, Executive Office of Energy and Environmental Affairs and Siting Board Chair; Matthew Nelson, Chair, Department of Public Utilities; Cecile M. Fraser, Commissioner, Department of Public Utilities; Patrick Woodcock, Commissioner, Department of Energy Resources; Gary Moran, Deputy Commissioner and designee for the Commissioner of Massachusetts Department of Environmental Protection; Jonathan Cosco**,** General Counsel and designee for the Secretary of the Executive Office of Housing and Development; and Brian Casey, Public Member.

Kathleen A. Theoharides, Chair
Energy Facilities Siting Board

Dated this 8th day of October, 2021

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 G.L., Chapter 25, Sec. 5; G.L. Chapter 164, Sec. 69P.