

# **Decisions and Orders**

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**Massachusetts Energy Facilities Siting Board**

**VOLUME 19**

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## ABBREVIATIONS

|                                  |  |
|----------------------------------|--|
| <u>BECo/Hopkinton</u>            | <u>Boston Edison Company, 6 DOMSB 208 (1997)</u>   |
| <u>Berkshire Power</u>           | <u>Berkshire Power Development, Inc., D.P.U. 96-104 (1997)</u>                           |
| <u>Cape Wind</u>                 | <u>Cape Wind Associates LLC, 15 DOMSB 1 (2005)</u>                                       |
| <u>CElCo/Kendall</u>             | <u>Cambridge Electric Light Company, 12 DOMSB 305 (2001)</u>                             |
| <u>Hydro-Quebec</u>              | <u>Massachusetts Electric Company/New England Power Company, 13 DOMSC 119 (1985)</u>     |
| <u>MECo (2002) Decision</u>      | <u>Massachusetts Electric Company, D.T.E. 01-77 (2002)</u>                               |
| <u>National Grid Worcester</u>   | <u>New England Power Company, EFSB 09-1/D.P.U. 09-52/09-53 (2011)</u>                    |
| <u>NSTAR/Stoughton</u>           | <u>NSTAR Electric Company, 14 DOMSB 233 (2005)</u>                                       |
| <u>NY Central Railroad</u>       | <u>New York Central Railroad v. Department of Public Utilities, 347 Mass. 586 (1964)</u> |
| <u>Russell</u>                   | <u>Russell Biomass, EFSB 07-4/D.P.U. 07-35/07-36 (2009)</u>                              |
| <u>Save the Bay</u>              | <u>Save the Bay v. Department of Public Utilities, 366 Mass. 667 (1975)</u>              |
| <u>Tennessee Decision (2002)</u> | <u>Tennessee Gas Pipeline Company, D.T.E. 01-57, at 3-4 (2002)</u>                       |
| <u>Tennessee/Agawam</u>          | <u>Tennessee Gas Pipeline Company, D.T.E. 01-57 (2002)</u>                               |
| Attorney General                 | Massachusetts Attorney General   |
| Canal Station                    | Canal Generating Station   |
| Canal Substation                 | Substation adjacent to Canal Station   |
| CEII                             | Critical energy infrastructure information   |
| Commonwealth                     | Commonwealth Electric Company or Commonwealth of Mass.                                   |
| Company                          | NSTAR Electric Company   |
| dBA                              | A-weighted decibels  |
| Department                       | Department of Public Utilities   |
| DOMSB                            | Decisions and Orders of Mass. Energy Facilities Siting Board                             |
| DOMSC                            | Decisions and Orders of Mass. Energy Facilities Siting Council                           |

|                                |   |
|--------------------------------|---|
| DSM                            | demand-side management  |
| EFSB                           | Energy Facilities Siting Board  |
| EIR                            | Environmental Impact Report   |
| EMF                            | electric and magnetic fields (here, 60 hertz magnetic field)  |
| FERC                           | Federal Energy Regulatory Commission  |
| G.L. c.                        | Massachusetts General Laws chapter  |
| GenOn                          | GenOn Canal LLC   |
| GHG                            | Green house gas(es)   |
| GSRP                           | Greater Springfield Reliability Project, <i>often including</i> the Manchester to Meekville Separation Project in Connecticut |
| hp                             | Horsepower  |
| ICAP                           | installed capacity  |
| ISO-NE                         | Independent System Operator of New England  |
| kV                             | Kilovolts   |
| Levitan                        | Levitan & Associates, Inc.  |
| Load Interruption<br>Guideline | Transmission System Planning Load Interruption Guideline  |
| long-term measures             | long-term Settlement Agreement directives to eliminate uplift charges   |
| Lower SEMA                     | Southern part of SEMA   |
| LSCPR                          | Local second-contingency protection resource  |
| LTE                            | Long-time emergency   |
| MACT                           | Utility Air Toxics' Maximum Achievable Control Technology   |
| MassDEP                        | Massachusetts Department of Environmental Protection  |
| MEPA                           | Massachusetts Environmental Protection Act  |
| mG                             | milligauss  |
| MHC                            | Massachusetts Historical Commission   |

|                 |   |
|-----------------|---|
| MODF            | Mineral oil dielectric fuel                                       |
| Moody's         | Moody's Analytics, Inc. and/or "Moody's Economy.com"              |
| MSSF            | Myles Standish State Forest                                       |
| MVA             | megavolt-amperes  |
| MVAR            | megavolt-amperes, reactive  |
| MW              | megawatts   |
| N-1             | single contingency loss of a transmission element                 |
| N-1-1           | contingency loss of one element followed by a second element loss |
| NAS             | National Academy of Sciences                                      |
| NEPOOL          | New England Power Pool  |
| NERC            | North American Electric Reliability Corporation                   |
| NERC Standards  | NERC reliability standards  |
| NHESP           | Natural Heritage and Endangered Species Program                   |
| NO <sub>x</sub> | oxides of nitrogen  |
| NPCC            | Northeast Power Coordinating Council                              |
| NPDES           | National Pollutant Discharge Elimination System                   |
| NSTAR           | NSTAR Electric Company  |
| NU              | Northeast Utilities   |
| PSC             | public service corporation  |
| REMVEC          | Rhode Island-Eastern Massachusetts-Vermont Energy Control         |
| RFP             | request for proposal  |
| RMR             | reliability-must-run  |
| ROW             | right-of-way  |
| RR              | record request  |
| RT DR           | real time demand response   |

|                      |  |
|----------------------|--|
| Sandwich             | Town of Sandwich   |
| SCR                  | selective catalytic reductor   |
| SEMA                 | Southeastern Massachusetts load zone                                   |
| Settlement agreement | Settlement of Dispute Over SEMA Charges                                |
| SF <sub>6</sub>      | sulfur hexafluoride  |
| short-term measures  | short-term Settlement Agreement directives to eliminate uplift charges |
| Siting Board         | Energy Facilities Siting Board   |
| Siting Petition      | Petition to construct the Project pursuant to G.L. c. 164, § 69J       |
| Solutions Report     | Lower Southeastern Massachusetts Area Long Term Solution Study Report  |
| Tremont East         | area served by substations east of Tremont Substation                  |
| USDOT                | U.S. Department of Transportation                                      |
| USEPA                | United States Environmental Protection Agency                          |
| VARs                 | volt-amperes, reactive   |
| WMECo                | Western Massachusetts Electric Company                                 |

EFSB 10-2/D.P.U. 10-131/10-132

Pursuant to G.L. c. 164, §69J, the Massachusetts Energy Facilities Siting Board (“Siting Board”) hereby approves, subject to the conditions set forth below, the petition of NSTAR Electric Company (“NSTAR” or the “Company”) to construct a new 345 kV transmission line in the towns of Carver, Plymouth and Bourne, separate an existing double circuit 345 kV transmission line onto separate sets of structures, build a new 345 kV to 115 kV substation in West Barnstable, and modify various other ancillary facilities. Pursuant to G.L. c. 164, § 72, the Siting Board hereby approves, subject to the conditions set forth below, the petition of NSTAR for a determination that the proposed 345 kV 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 NSTAR for individual exemptions from the zoning bylaws of the towns of Carver, Plymouth, Bourne and Barnstable, but denies NSTAR’s request for a comprehensive exemption from those zoning bylaws in connection with the proposed transmission facilities and substation, as described herein.

## I. INTRODUCTION

### A. Summary of the Project

NSTAR proposes to construct improvements to its transmission system in southeastern Massachusetts, including 18 miles of new 345 kilovolt (“kV”) overhead transmission line on an existing right-of-way (“ROW”) in the towns of Carver, Plymouth and Bourne (Exh. NSTAR-1, at 1-1, 1-9). The Company also proposes to: (1) separate an existing double-circuit 345 kV transmission line crossing of the Cape Cod Canal onto two separate sets of structures; construct a new 345 kV-to-115 kV substation in West Barnstable; and (3) ancillary station changes including the addition of a new 345 kV breaker position at Carver Substation, an expanded 115 kV bus and new switching positions at Bourne Switching Station, as well as additional buswork at the State Forest Transition Station and Plymouth Crossover Station, both in Plymouth (id.). Finally, (4) the Company would increase the voltage from 115 kV to 345 kV without need of construction on existing transmission Line 120, which runs 12.8 miles from the Bourne Switching Station to the proposed new substation in West Barnstable (together, the “Project”) (id. at 1-1).

The Company is required under G.L. c. 164, § 69J to present both a preferred route and an alternative route for its project. In this case, the alternative route is 19.4 miles long and

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begins at the Carver Substation and travels south and east through Rochester, Wareham and Plymouth and ends in Bourne (“Alternative Route”) (*id.* at 1-10, 1-11).<sup>1</sup> The other portions of the Project, including separating the existing 345 kV circuits crossing the canal, raising the voltage of a section of the existing Line 120, and construction of the proposed substation in West Barnstable, would all occur regardless of whether the Project is located along the Primary or Alternative Route (*id.* at 1-9, 1-12, 1-13). The Alternative Route would also require ancillary improvements, including the addition of a 345 kV breaker position at Carver Substation, as well as the improvements at Bourne Switching Station mentioned above with respect to the Primary Route (*id.*).

B. Procedural History

On September 20, 2010, NSTAR filed a petition to construct the Project pursuant to G.L. c. 164, § 69J (“Siting Petition”) with the Siting Board. On October 4, 2010, the Company filed a zoning exemption petition pursuant to G.L. c. 40A, § 3 (“Zoning Petition”) and a petition for approval pursuant to G.L. c. 164, § 72 (“Section 72 Petition” and together, “Consolidated Petitions”) with the Department of Public Utilities (“Department”). On October 12, 2010, the Chair of the Department consolidated the three petitions for hearing and decision by the Siting Board. Accordingly, the Siting Board conducted a single adjudicatory proceeding and developed a single evidentiary record for the Consolidated Petitions.

Siting Board Staff conducted three public hearings regarding the Project. The hearings were held on December 8, 2010, in Carver; on December 14, 2010, in Bourne; and on December 15, 2010, in Barnstable.<sup>2</sup> A Hearing Officer ruling dated January 14, 2011 granted intervenor status to the Massachusetts Attorney General (“Attorney General”); GenOn Canal, LLC, the owner/operator of Canal Station (“GenOn”); ISO-New England, Inc. (“ISO-NE”); the Town of Sandwich (“Sandwich”); Kathryn Armstrong (a resident of Barnstable); and Kerry LaLiberte

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<sup>1</sup> For both the Primary and Alternative Routes the distances include 1.4 miles from Bournedale Road to Bourne Switching Station via the Cape Cod Canal, a portion that is common to both routes.

<sup>2</sup> Siting Board Staff also conducted site visits on December 8, 2010, and December 15, 2010.

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(a resident of Carver).<sup>3</sup> The Hearing Officer also granted limited participant petitions for Mary O'Donnell (a resident of Kingston) and Frederick Weston (a resident of Carver).

Siting Board Staff conducted a technical session on March 25, 2011. Staff held 15 days of evidentiary hearings beginning on May 9, 2011 and ending on July 1, 2011. NSTAR presented the testimony of 16 witnesses in support of the Consolidated Petitions: Henry Oheim, Charles Salamone, Robert Clarke, Michael Rife, John Zicko, Gregory Sullivan, Kevin McCune, Christine Vaughan, Theodore Barten, Michael Howard, Peter Valberg, Richard Levitan, Ellen Cool, Boris Shapiro, John Elder, and Bryant Robinson. GenOn presented four witnesses: Anne Cleary, Shawn Konary, Ira Shavel, and Philip Smith. ISO-NE presented two witnesses: Frank Mezzanotte and Richard Kowalski. Sandwich presented two witnesses: George Dunham and Paul Chernick. Over 1,000 exhibits were entered into the evidentiary record (Company Brief at 8).

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

The Company filed the Siting Petition pursuant to: (1) G.L. c. 164, § 69H, which requires the Siting Board to implement its statute so as to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost; and (2) G.L. c. 164, § 69J, which requires a project applicant to obtain Siting Board approval for the construction of a proposed energy “facility” before a construction permit may be issued by another state agency.

G.L. c. 164, § 69G defines a “facility” to include:

a new electric transmission line having a design rating of 115 kilovolts or more which is 10 miles or more in length on an existing transmission corridor except reconductoring or rebuilding of transmission lines at the same voltage.

The proposed 345 kV transmission line is a “facility” with respect to Section 69J.

In accordance with G.L. c. 164, §§ 69H and 69J, before approving a petition to construct, the Siting Board requires an applicant to justify its proposal in four phases. First, the Siting Board requires the applicant to show that additional energy resources are needed (see Section III, below). Second, the Siting Board requires the applicant to establish that, on balance, its

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<sup>3</sup> Ms. Armstrong subsequently withdrew as an intervenor in the proceeding. See Armstrong Letter dated October 5, 2011.

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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). Third, the Siting Board requires the applicant to show that it has considered a reasonable range of practical siting alternatives and that the proposed site for the project is superior to a noticed alternative site in terms of cost, environmental impact, and reliability of supply (see Section V, below). Finally, the applicant must show that its plans for construction of its new facilities are consistent with the current health, environmental protection and resource use and development policies of the Commonwealth (see Section VI, below).

### III. NEED

#### A. Standard of Review

G.L. c. 164, § 69J provides that the Siting Board should approve a petition to construct if the Board determines that the petition meets certain requirements, including that the 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. To accomplish this, the Board must, among other matters, review the need for the facilities to meet reliability, economic efficiency, or environmental objectives. G.L. c. 164, § 69H. Consistent therewith, G.L. c. 164, § 69J requires applicants to include in their petitions an analysis of need for the facility.<sup>4</sup>

To ensure reliability, each transmission and distribution company establishes planning criteria for construction, operation, and maintenance of its transmission and distribution system. Compliance with the applicable planning criteria can demonstrate a "reliable" system. See e.g., New England Power Company, EFSB 09-1/D.P.U. 09-52/09-53, at 4-5 (2011) ("National Grid Worcester"); Western Massachusetts Electric Company, EFSB 08-2/D.P.U. 08-105/08-106, at 8

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<sup>4</sup> The Siting Board's review of proposed transmission facilities is conducted pursuant to G.L. c. 164, § 69J. This section states, in part, that "[n]o applicant shall commence construction of a facility at a site unless . . . in the case of an electric or gas company which is required to file a long-range forecast pursuant to section sixty-nine I, that facility is consistent with the most recently approved long-range forecast for that company." The Siting Board notes that, pursuant to the Department's Order in D.T.E. 98-84A, Massachusetts electric companies, including NSTAR, are now exempt from the requirements of G.L. c. 164, § 69I. Thus, the Siting Board need not consider whether the proposed transmission facilities are consistent with a recently-approved long range forecast.

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(2010) (“GSRP”); Boston Edison Company, 6 DOMSB 208, at 243-245 (1997) (BECo/Hopkinton).

To determine whether system improvements are needed, the Siting Board: (1) examines the reasonableness of the Company’s system reliability planning criteria; (2) determines whether the Company 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.

When a petitioner’s assessment of system reliability and facility requirements are, 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. G.L. c. 164, § 69J. To ensure that this standard has been met, the Siting Board requires that forecasts be reviewable, appropriate and reliable. GSRP, EFSB 08-2/D.P.U. 08-105/08-106, at 9; NSTAR Electric Company, 14 DOMSB 233, at 252-253 (2005) (NSTAR/Stoughton); BECo/Hopkinton, 6 DOMSB 208, at 232 (1997). 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 that produced it. A forecast is reliable if the method provides a measure of confidence that its data, assumptions and judgments produce a forecast of what is most likely to occur. GSRP, EFSB 08-2/D.P.U. 08-105/08-106, at 9; NSTAR/Stoughton, 14 DOMSB 233, at 253; BECo/Hopkinton, 6 DOMSB 208, at 232.

## B. The Existing Transmission System in Lower SEMA

### 1. Description

“Southeastern Massachusetts” (“SEMA”) is designated by ISO-NE as a load zone. SEMA is served by NSTAR, Massachusetts Electric,<sup>5</sup> and several municipal electric departments, with a number of generation facilities plus transmission connections to other parts

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<sup>5</sup> Massachusetts Electric Company is a wholly-owned subsidiary of National Grid USA, as is Nantucket Electric Company.

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of New England. NSTAR defines “Lower SEMA” as an area including Greater New Bedford and other South Coast communities, the South Shore from Marshfield to Plymouth (including Carver and Plympton), Cape Cod, and the islands of Martha’s Vineyard and Nantucket (Exhs. NSTAR-1, at 2-1; EFSB-N-5). NSTAR provides transmission and distribution service in this area except to Nantucket, which is served by Nantucket Electric via submarine cables from substations on Cape Cod. Lower SEMA is served by local generation and by transmission lines including a 115 kV connection to the Fall River area, two 115 kV connections to the Kingston area, and three 345 kV ties to the rest of the grid (Exh. EFSB-G-1).

A smaller area within Lower SEMA, served by substations to the east of Tremont Substation in Wareham, is designated as “Tremont East” and consists of the Cape and Islands plus parts of Wareham and Plymouth (Exh. EFSB-N-6). Two units at the Canal Generating Station (“Canal Station”) in Sandwich are the only large generation sources in Tremont East. Tremont East has four transmission level ties to the rest of the grid: two 115 kV lines, Lines 108 and 113, extending east from Tremont Substation and terminating at Bourne Switching Station after crossing the Cape Cod Canal; and two 345 kV lines. One of the 345 kV lines, Line 322, extends from Carver Substation (where it connects to another 345 kV line, Line 331) to a substation adjacent to Canal Station (“Canal Substation”) (Exh. EFSB-G-2). The second, Line 342, has termini at Auburn Substation in Whitman, at a substation at the Pilgrim Nuclear Station in the Manomet section of Plymouth, and at Canal Substation (*id.*). The two 345 kV lines share a right-of-way from a location identified as the State Forest Transition Station to Canal Substation. The two 115 kV lines also share a right-of-way from the Tremont Substation to the Bourne Switching Station, but with the exception of about one-half mile in Bourne, it is a different right-of-way from the 345 kV lines (Exhs. NSTAR-1, at fig. 5-3; EFSB-G-1(1)). All four of these transmission lines cross the Cape Cod Canal on overhead, double-circuit towers, the two 115 kV lines on one set of structures and the two 345 kV lines on the other set.

NSTAR stated that there are nearly 225,000 customers in Tremont East (Exh. NSTAR-1, at 3-6). Most of the load in Tremont East is east of the Cape Cod Canal. The remainder is served by Wareham, Valley, and Manomet Substations (Exh. EFSB-G-2). The only facility on Cape Cod currently operated at 345 kV is the higher voltage side of Canal Substation, along with Lines 322 and 342 which terminate there. Two 115 kV lines connect Canal Substation to the Bourne Switching Station; a third, Line 120, bypasses Bourne Switching Station on its way from

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Canal Substation to West Barnstable. Two other 115 kV lines from Bourne Switching Station serve Cape Cod substations, one extending directly to West Barnstable on the same right-of-way as Line 120, and one routed through the Falmouth area. Load on the Cape and Islands is served via these last three 115 kV lines from Canal Substation and Bourne Switching Station. Among the three, the majority of Line 120 was designed with hardware and clearances capable of carrying 345 kV, but it has only operated at 115 kV. The only 345 kV/115 kV transformers operating in Tremont East are at Canal Substation. A schematic transmission system map of Lower SEMA is attached as Figure 1.

Lines 108 and 113 were built in 1960 and 1967, respectively (Exh. NSTAR-1, at 1-2). Each line has a capacity of 227 megavolt-amperes (“MVA”)<sup>6</sup> normal and 246 MVA emergency (Exh. EFSB-N-6). The lines have a combined capacity of approximately 460 MW as rated for 12 hours (*id.*; Exh. SAN-NSTAR-2-32; Tr. 2, at 199-201). NSTAR stated that Lines 322 and 342 were constructed in 1968 and 1971 for the purpose of providing access to the power generated at Canal Station and Pilgrim Nuclear Station (Exh. NSTAR-1, at 1-2). Lines 108, 113, and 322 are owned by NSTAR, while NSTAR and National Grid jointly own Line 342 and also Line 331 (Exh. SAN-NSTAR-2-68(1) at 1, 4). The two 345 kV lines are high capacity lines with a combined total of 2400 MW capacity.

## 2. History of Transmission Issues in Lower SEMA

Weather and equipment failures are the top causes of transmission line outages exceeding one hour on Cape Cod, according to NSTAR (Tr. 4, at 621-622). Weather-related causes have included lightning, wind, hurricanes, snow and ice (*id.*). Equipment problems have included failure of a structural tower or tower arm, and a falling static wire (*id.*). In one instance, in 2002, an aircraft contacted a Cape transmission line, causing an outage (*id.*). Whether such transmission outages lead to customer outages depends in part on whether other energy resources are available to deliver power.

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<sup>6</sup> MVA is a measure that includes MWs and volt-amperes, reactive (“VARs”). When VARs are in an appropriate range, an MVA measurement is just slightly higher than an MW measurement. Witnesses in the case used the terms almost interchangeably and we do the same here.

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a. Canal Station Connections

The Canal Station Unit 1 (550 MW) and Unit 2 (545 MW) began commercial operation in 1968 and 1976, respectively (Exh. NSTAR-1(2-1) at 13; EFSB-N-5; Tr. 6, at 877). Unit 1 was designed as a baseload unit, and operates only on residual oil (Exh. NSTAR-1, at 1-3). Unit 1 is equipped with a selective catalytic reduction (“SCR”) unit to control nitrogen oxides (“NO<sub>x</sub>”) (Exh. NSTAR-1(2-1) at 13). Although Unit 2 was designed as dual-fuel unit capable of running on residual oil or gas, it has little if any history of operating on gas and managers bid and operate Unit 2 on oil even when oil is relatively expensive (*id.*; Tr. 8, at 996, 1029). Unit 2 does not have SCR and relies on selective non-catalytic reduction, which NSTAR stated is less efficient in reducing NO<sub>x</sub> emissions (Exh. NSTAR-1(2-1) at 14).

b. 2003 Cape Cod Blackout

A wide-scale power interruption occurred in Lower SEMA on December 1, 2003. The circumstances were described in a Joint Report prepared by ISO-NE, National Grid, and NSTAR, dated December 19, 2003 (Exh. SAN-NSTAR-2-68(1)). Of the eight investigators, three were witnesses in the present proceeding. At the start of the day, Canal Unit 2 was on line but Canal Unit 1 was not (*id.*). Early in the morning, one of the 115 kV lines was switched out for scheduled maintenance (*id.*). Early in the afternoon, brush fires under the 345 kV lines north of Carver triggered momentary faults on Line 331 (*id.*). Subsequently, at 1:28 p.m., the Rhode Island-Eastern Massachusetts-Vermont Energy Control (“REMVEC”), which is the local transmission operating authority, operated by National Grid, took Line 331 out of service for an inspection, returning the line to service at 6:29 p.m. (*id.*). Following this action, REMVEC and ISO-NE operators, attempting to follow a written stability procedure for Line 331 being out of service, opened a circuit breaker at the Canal Substation (*id.*). According to the Joint Report, REMVEC and ISO-NE were then unaware that in this configuration, if Canal Unit 2 shut down, a second 345 kV line would go out of service as well, putting the entire Cape Cod area load onto the one operating 115 kV line (*id.*).

At about 6:00 p.m., a fire stemming from a fuel oil leak broke out at Canal Station, leading the plant operator to shut down Canal Unit 2 (*id.*). This automatically caused the second 345 kV line to come out of service (*id.*). Within minutes, protective controls interrupted the second 115 kV line, which had become overloaded (*id.*). Power was interrupted to approximately 300,000 customers, including customers on Cape Cod, in the New Bedford area,

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and some in the Plymouth area, starting at 6:21 p.m. (*id.*; Exh. SAN-NSTAR-2-67). The Joint Report does not specify which of the four available transmission lines to Tremont East was returned to service first, but it does state that three-quarters of the load was restored by 7:33 p.m., and power to all customers was restored by 8:15 p.m. (Exh. SAN-NSTAR-2-68(1)).<sup>7</sup> Among the immediate actions in the wake of the incident, ISO-NE modified the operating guidance to avoid opening breakers at Canal Substation without careful consideration (*id.*). An added response was to re-configure switches at Canal Substation for more robust and flexible service.

c. Uplift Costs, Allocation, and the Settlement Agreement

Until 2006, the Canal units typically were dispatched by ISO-NE based on merit order, usually for baseload requirements (Tr. 1, at 156). The Company stated that a significant price premium for residual oil relative to natural gas on a British Thermal Unit (“BTU”) basis emerged in 2006 and has continued to the present time (*id.*). As a result of this persistent fuel price differential and overall market conditions since 2006, the energy market bids by the Canal units are not competitive with market-clearing bids accepted by ISO-NE (Tr. 8, at 995-996). On economic grounds alone, ISO-NE would rarely require the operation of either Canal unit.

Beginning in 2006, NSTAR determined that, in order to avoid overloads and voltage issues in the event of loss of the two 345 kV lines, Lines 331 and 342, it needed one Canal unit to operate, regardless of economic merit (*see* Tr. 2, at 234-236; Tr. 9, at 995-996). At that time, NSTAR found that a combined loss of the Lines 342 and 331 would have caused thermal overloads on a number of 115 kV lines in Lower SEMA, resulting in wide-area outages, when Lower SEMA loads exceeded 76 percent of peak load (Tr. 6, at 808-810). In addition, NSTAR determined that loss of Lines 342 and 322 would have caused overloads on 115 kV lines serving

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<sup>7</sup> Characterization of the incident by parties does not match up well with the Joint Report. In the Petition, the Company stated that a 345 kV line (rather than a 115 kV line) was out of service for scheduled maintenance activity. The Petition also does not mention operators’ decision to turn off one 345 kV line because of a brush fire nor operators’ decision, based on a possibly ambiguous protocol, to open an additional switch that put the second 345 kV line in the vulnerable position of being tied to Canal 2, which then shut down for other reasons (Exh. NSTAR-1, at 1-3). The Attorney General recounted the version of the incident described in NSTAR’s Petition (Attorney General Brief at 5). ISO-NE asserted that the 2003 outage “was largely a distribution level problem,” whereas the Joint Report refers to events on 115 kV and 345 kV circuitry and at a generator (ISO Initial Brief at 25).

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Tremont East when area loads exceeded 70 of peak load, assuming the Canal units were off (Tr. 6, at 808-810). If both Line 342 and Line 322 are lost, Tremont East is served radially by the two 115 kV lines, Lines 108 and 113 (Exh. SAN-NSTAR-2-35). As a result, NSTAR contends that ISO-NE initially felt that operation of the Canal units was only needed for local protection in the event of an N-1-1 contingency, but subsequently concluded that dispatch of the units was necessary to protect against an N-1-1 contingency that posed a threat to the reliability of the bulk power system (Tr. 2, at 235-236).<sup>8</sup>

NSTAR requested dispatch of Canal units to protect local customers against loss of load in the event of an N-1-1 contingency (Tr. 3, at 234). Following this request, ISO-NE dispatched one Canal unit 24 hours a day in order to provide power and voltage support as protection for all of Lower SEMA to avoid potential adverse effects of a contingency loss of both 345 kV lines. This reliability-must-run (“RMR”) operation resulted in uplift payments to the operators of Canal Station for the additional cost of operating Canal when the units exceeded the regional clearing price for energy (*i.e.*, when the units were out of economic merit). The incremental cost of operating the Canal units for second contingency system support compared to market price generation units totaled approximately \$316 million in 2006, 2007, and 2008 (Exh. NSTAR-1, at 3-2; Tr. 2, at 239).

ISO-NE dispatched the Canal units as Special Constraint Resources, under which the costs were to be allocated solely to NSTAR. NSTAR objected, arguing that the costs should be allocated more broadly throughout SEMA. ISO-NE agreed with NSTAR, and both retroactively and prospectively allocated such costs to the entire SEMA region. ISO-NE’s decision meant that NSTAR, Massachusetts Electric, Nantucket Electric, and municipal electric companies in SEMA paid the incremental cost (Tr. 2, at 234). Some of the affected entities disagreed with this decision, brought the dispute to the Federal Energy Regulatory Commission (“FERC”), and settlement proceedings commenced.

Several stakeholders in the process, including NSTAR, National Grid, ISO-NE, Braintree Electric Light Department, Hingham Municipal Lighting Plant, Taunton Municipal Lighting

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<sup>8</sup> An N-1 contingency is the unexpected loss of one element of the transmission system (or of two transmission lines sharing a common tower, or two elements sharing a common circuit breaker). An “N-1-1” contingency consists of an N-1 contingency followed, more than 30 minutes after the first outage but before the repair of the first outage, by a second unexpected loss of a transmission element.

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Plant, and a number of generating companies agreed in May 2007 to a Settlement of Dispute Over SEMA Charges (“Settlement Agreement”).<sup>9</sup> The Settling Parties agreed to seek FERC approval for some tariff language changes related to the uplift payments. In addition, the Settlement Agreement directed parties to design and proceed with some easily permitted and constructed measures to eliminate the majority of the uplift charges (“short-term measures”), and to identify larger projects that would eliminate the remainder of the uplift charges (“long-term measures”). The Settlement Agreement obligated ISO-NE to evaluate and provide cost estimates for projects that would maintain reliability in Lower SEMA without a need to operate one or both Canal units out of economic merit order (Company Brief at 2-3, citing Exh. EFSB-N-26). FERC accepted the Settlement Agreement for filing on June 21, 2007 (Exh. EFSB-N-2(c)(1) at 1). The Lower SEMA Project was developed by NSTAR as its proposed long-term measure.

d. The Short-Term Measures

NSTAR’s short-term measures reinforced the system so that service can be maintained in the event of an N-1-1 loss of the two 345 kV lines supplying Cape Cod when load levels are moderate and there is no generation at the Canal units (Exh. NSTAR-1, at 1-5). By June 2009, NSTAR had installed new 345/115 connections at Carver Substation and a new 115 kV transmission line from Carver Substation to Tremont Substation in Wareham. For local voltage support, NSTAR installed a static VAR compensator at Barnstable Switching Station that automatically delivers VARs to the transmission system as needed (Tr. 2, at 222). Prior to the short-term measures, N-1-1 contingency loss of Lines 342 and 331 would have resulted in service interruption to all of Lower SEMA. These short-term measures solve the modeled N-1-1 overloads from loss of Lines 342 and 331, and Plymouth and New Bedford are no longer vulnerable to an N-1-1 contingency on the 345 kV lines (Exh. NSTAR-1, at 2-27; Tr. 6, at 808). In addition, the short-term measures improved system performance in Tremont East for loss of Lines 342 and 322 under some conditions (NSTAR-1, at 2-19).

In addition to physical improvements to the transmission system, ISO-NE, NSTAR, and National Grid developed a transmission operations guide that incorporated limited load-shedding

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<sup>9</sup> The Department (then the Department of Telecommunications and Energy) and NEPOOL also participated in the FERC proceeding, but are not signatories to the Settlement Agreement (Exhs. EFSB-N-2(a) at 2 of 127; EFSB-N-4).

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to maintain overall system reliability in lieu of operating the Canal units (see Exh. EFSB-N-3(1) at 5).<sup>10</sup> Posturing the transmission system after the first contingency so that load is interrupted as a consequence of the second contingency reduces the remaining load in Tremont East to a level that can reliably be served with the two 115 kV lines at the instant when the second 345 kV line goes out, thereby preventing voltage collapse throughout Tremont East.<sup>11</sup>

The Company characterized the short-term measures as effective, performing better than expected (Exh. NSTAR-1, at 1-5). As a result, system operators no longer require operation of the Canal units to prevent second contingency overloads and load shedding.<sup>12</sup> The Canal units operated only sporadically from April 2009 to December 2010, and there were no payments to Canal as an RMR or local second-contingency protection resource (“LSCPR”) in 2010 (RR-EFSB-1; RR-EFSB-GEN-1(1)).<sup>13</sup> According to ISO-NE, the limited hours of operation for Canal during this period were primarily to maintain operating reserves at high load levels and to

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<sup>10</sup> Specific details on situational load-shedding are considered Critical Energy Infrastructure Information (“CEII”) and are therefore confidential.

<sup>11</sup> Following loss of one 345 kV line, NSTAR can “posture” the system to drop load in the event of a second contingency by opening switches between an area served by 115 kV lines and another area served by the second 345 kV lines; this posturing is also known as post-first-contingency switching (Exh. NSTAR-CPS-2, at 10; Tr. 14, at 2030). The purpose is to avoid voltage collapse on the second contingency. The effect is for load to be positioned to drop as a direct result of the second contingency. Because there is a limited number of ways to divide Tremont East load, there is also a limited ability to posture for load loss.

<sup>12</sup> Establishing that the Canal units are no longer called upon to run for second-contingency protection was hampered by erroneous information initially provided by the Company. The Siting Petition incorrectly states: (1) that “one Canal unit is committed out of economic merit order for approximately 42 - 58 days per year to maintain reserve requirements”, and (2) that, were a “do nothing” alternative selected, the Canal units “would continue to run out of merit on heavy load days” (Exh. NSTAR-1, at 2-34, 3-5; also, Company Brief at 29). Several witnesses initially appeared to indicate that the Canal units were still being operated for reliability purposes (Tr. 3, at 337; Tr. 4, at 596; see also RR-EFSB-7). GenOn was later able to clarify that the Canal units have not been dispatched for local second-contingency protection since August 2009, when the short-term measures were completed (Tr. 8, at 1008).

<sup>13</sup> In 2008, LSCPR replaced RMR as the payment mechanism for certain reliability services of generators.

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control VARs at light load levels (Tr. 10, at 1346, 1471). Annual operating hours in the last six years are presented in Table 1.

**Table 1. Recent Historical Annual Hours of Operation, Canal Units One and Two**

| Year           | 2005     | 2006     | 2007     | 2008     | 2009     | 2010    |
|----------------|----------|----------|----------|----------|----------|---------|
| Canal Unit One | 6646 hrs | 3850 hrs | 7455 hrs | 6231 hrs | 2030 hrs | 424 hrs |
| Canal Unit Two | 5975 hrs | 5150 hrs | 3084 hrs | 3030 hrs | 436 hrs  | 141 hrs |

(RR-EFSB-1).

C. Description of Company’s Demonstration of Need

1. Regional/National Context for Company Reliability Planning

NSTAR described key aspects of the regional and national reliability-planning regime and the resulting standards and procedures applicable to the Company’s transmission system (Exh. NSTAR-1, at 2-1). NSTAR’s transmission system is an integral part of the bulk power system delivering power to customers in the northeast region of the United States, and NSTAR is required to ensure that adequate resources are available to meet projected load requirements. As a transmission provider, NSTAR must maintain its system consistent with the reliability standards and criteria developed by the Northeast Power Coordinating Council (“NPCC”), the New England Power Pool (“NEPOOL”) and ISO-NE (*id.*). These criteria are established under the purview of the North American Electric Reliability Council (“NERC”), which sets the standards for electric power transmission for all of North America. The criteria set by NPCC and ISO-NE expressly require transmission operators, such as NSTAR, to design, test and operate their system to withstand representative contingencies as specified in the criteria. NSTAR stated that if the NSTAR transmission system does not have sufficient capability to serve forecasted load under the conditions outlined in the NPCC and ISO-NE criteria, the Company must plan and implement additions and upgrades to address the identified inadequacies (*id.*).

Based on NERC, NPCC and ISO-NE requirements, the Company’s reliability criteria specify that system voltages, line loadings and equipment loadings should be within normal limits for normal conditions and within applicable emergency limits for single and double-contingency situations (*id.* at 2-13). Specifically, the criteria require the Company to simulate

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the performance of the system in the event of N-1 and N-1-1 contingencies. NSTAR notes that all of the relevant planning standards and criteria applicable to the Company's system are deterministic in nature in that the standards are designed to assess the performance of the Company's 115kV and 345kV transmission elements under a series of defined contingency situations (id. at 2-12).

In 2001, FERC assigned ISO-NE primary responsibility for transmission planning in New England (id. at 2-4). In 2004, FERC approved ISO-NE as the Regional Transmission Operator ("RTO") for New England. Beginning in 2007, ISO-NE took steps to adopt a transmission planning process in accordance with FERC Order Nos. 890, 890-A and 890-B, which is referred to as the "Regional System Planning Process" and is set forth in Attachment K of NEPOOL's Open Access Transmission Tariff ("OATT") (id.). In administering the Regional System Planning Process, ISO-NE has a number of responsibilities relating to both generation and transmission resources. For transmission resources, ISO-NE's primary functions are to: (1) conduct periodic needs assessment on a system-wide or specific-area basis, and (2) develop an annual regional transmission plan using a ten-year planning horizon. Needs assessments are designed to identify future system needs with consideration of available market solutions, which could include regulated transmission upgrades or other market responses (id. at 2-6).

Under Attachment K of the OATT, major transmission upgrades include the following steps: (1) system needs are identified through a periodic needs assessment undertaken by ISO-NE subject to stakeholder review and input; (2) regulated transmission solutions are suggested to meet identified system needs; (3) solution studies are prepared to identify the most cost-effective regulated transmission solutions; (4) proposed regulated transmission solutions are reviewed and approved by ISO-NE; and (5) transmission cost allocation is conducted under the OATT (id.). NSTAR's Project is the result of a needs assessment conducted by ISO-NE for the Lower SEMA area as was identified as the most cost-effective regulated transmission solution through a solution study process.

NSTAR's planning process is integrated with and coordinated by ISO-NE as part of its regional planning process and annual Regional System Plan (id. at 2-9). NSTAR conducts an annual review that evaluates the system's performance under projected operating conditions over a ten-year planning period. NSTAR stated that its planning process uses contingency conditions that involve the planned or unplanned loss of one or more major system elements such as

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transmission lines, auto-transformers, and major generators in various combinations which would adversely affect the transmission system (*id.* at 2-13). The Company analyzes each component of the transmission system that serves as a limiting element with respect to capacity of the transmission lines, and models each circuit to simulate operations under the forecast condition. The transmission system is tested for reliability using computer modeling software that runs a series of “what if” scenarios at present and over the planning period, involving one or more contingencies in which one or more elements of the transmission system are assumed to be unexpectedly out of service. The system is studied under projected peak load conditions, to determine whether it remains capable of serving load without violating any thermal or voltage standards (*id.*). If the modeling process shows that the transmission system will experience overloads then there is a reliability issue that the Company will address with the addition or upgrade of transmission facilities. NSTAR also evaluates the adequacy of the voltages on the transmission and distribution systems.

## 2. Federal, NERC, and NPCC Requirements

The North American Electric Reliability Corporation’s (“NERC”) establishes reliability standards (“NERC Standards”) for the U.S. transmission system and requires the application of power flow modeling to determine whether a transmission system is able to meet NERC Standards; the Northeast Power Coordinating Council (“NPCC”) brings the requirements to our region. Prior to 2005, NERC standards were voluntary on the part of transmission utilities like NSTAR. With the passage of the Energy Policy Act of 2005, Pub. L. No.109-58, 119 Stat. 594 (2005) and subsequent regulatory actions by FERC, the NERC standards became mandatory and enforceable. 16 U.S.C. 824o(e) (2011), North American Electric Reliability Corp., 116 FERC ¶ 61,062, *order on reh’g & compliance*, 117 FERC ¶ 61,126 (2006), *aff’d sub nom.*, Alcoa, Inc. v. FERC, 564 F.3d 1342 (D.C. Cir. 2009).

The required modeling allows planners to understand whether the overall transmission system is capable of withstanding various contingencies without violating either thermal limits or voltage requirements for the individual transmission elements that make up the system. See Mandatory Reliability Standards for the Bulk-Power System, Order No. 693, FERC Stats and Regs. ¶ 31,242, *order on reh’g*. Order No. 693-A, 120 FERC ¶ 61,053 (2007) (“FERC Order 693”). A thermal limit establishes the maximum carrying capacity that a particular line cannot exceed for a particular period of time without causing unsafe sagging of the line or shortening

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the expected life of the line. See GSRP, at 15-16. A voltage violation is demonstrated when the transmission study shows that the required voltages cannot be maintained at established levels when the transmission system is modeled at peak load with the loss of modeled transmission elements. Voltage that exceeds or falls below acceptable levels can damage or even destroy utility electrical equipment and customer electrical devices. Extreme voltage variations can lead to voltage collapse, where voltage drops to zero and can potentially cascade across wide areas of the system, leading to further equipment damage and widespread customer outages.

NERC Standards generally require that a transmission system be able to withstand an N-1 contingency without thermal or voltage violations and without solving thermal or voltage violations with an interruption of load. Id. Power flow modeling is also required to determine whether the transmission system is capable of withstanding an N-1-1 contingency. Where a transmission system is found to be unable to withstand an N-1-1 contingency, the transmission system may be upgraded. However, depending on system design and expected system impacts, NERC standards will allow some planned or controlled load interruption as an acceptable approach to solve thermal or voltage violations that occur upon the second contingency of an N-1-1 event. See FERC Order 693, at ¶¶ 1818, 1825. The primary goal in such circumstances is to maintain the integrity and reliability of the overall transmission system. A secondary goal is to minimize the interruption of load.

Although single-element contingencies (N-1) do occur, multiple element contingencies (such as N-1-1) are considerably less likely because two different low-likelihood transmission line or other equipment failures would have to overlap in time. Id. at ¶¶ 1813-1814. However, NERC standards require that the contingencies be applied in a “deterministic” matter, without regard for the probability that the single contingency would actually occur or that the two independent contingencies would occur one after the other. The current power flow modeling methodology does not calculate or incorporate the probability that the various N-1 or N-1-1 contingencies studied would actually occur. U.S. Department of Energy, *National Transmission Grid Study* at B-14 (May 2002).

While NERC permits load interruption to solve transmission needs that arise upon N-1-1 contingencies, it does not establish a limit on the amount of load that can be shed under those circumstances. In 2010, ISO-NE representatives proposed a Transmission System Planning

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Load Interruption Guideline (“Load Interruption Guideline”).<sup>14</sup> If adopted, the Load Interruption Guideline is intended to provide policy guidance for when it would be acceptable to rely on planned or controlled load interruption to address an N-1-1 contingency. According to the Load Interruption Guideline, the acceptability of interrupting load depends on “the amount of load at risk, the duration of the interruptions, the frequency of interruptions, the customers affected and the impacts of geography” (RR-EFSB-ISO-3(1) at 4).

The proposed Load Interruption Guideline states that load interruption for N-1-1 contingencies is allowed from 0-100 MW, and is “potentially allowable” from 100-300 MW. With interruptions up to 100 MW, the Guideline states that transmission solutions “would generally not be undertaken and the cost of [the] transmission solution would not generally be approved as a regional cost” (*id.* at 7). By contrast, transmission solutions may be approved as a regional cost for situations involving the interruption of between 100 and 300 MW, depending on the level of the load interruptions, the characteristics of the load being interrupted, restoration time, hours of exposure and the cost of the solution (*id.*). ISO-NE proposes that loads exceeding 300 MW should not be interrupted as a result of N-1-1 contingencies.

### 3. Description of the Company’s Reliability and Need Analysis

#### a. Load Forecasting Methodology

The Company developed a peak-load forecast for purposes of testing and evaluating the reliability of the system and resource needs (Exh. NSTAR-1, at 2-20). The Company used ISO-NE’s recently approved peak forecast for New England and adapted it to determine peak loads over the planning horizon at the Company’s substations serving Lower SEMA in general and Tremont East in particular (*id.*). The Company’s substation peak demand forecasts are derived from econometric models for each substation as a function of each substation’s historic peaks relative to the operating region’s peak (*id.* at 2-21). Each operating region’s peak is forecasted based on regional econometric variables and the Temperature Humidity Index (“THI”) (*id.*). Substation forecasts are then developed by simulating the estimated historic relationship between forecasts of the operating region’s peak trend and the THI under the

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<sup>14</sup> On November 17, 2010, ISO-NE representatives made a PowerPoint presentation of the proposed Load Interruption Guideline at a meeting of the ISO Reliability Committee. ISO-NE indicated that when finalized, the guideline would be effected as an ISO-NE Planning Procedure (RR-EFSB-ISO-3(1) at 2).

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extreme weather (“90/10” assumption<sup>15</sup>) which is the same basis on which transmission planning is performed by ISO-NE (id. at 2-22; Exh. SAN-NSTAR-2-1; Tr. 2, at 182).

Each operating region’s forecast is initially produced through econometric regression equations without consideration of additional energy efficiency programs (Exh. NSTAR-1, at 2-22). After the peak forecast is produced for each operating region, projected incremental energy efficiency is subtracted from the peak demand forecast (id.). Demand reduction due to energy efficiency is spread across the substations in a region according to the size of each substation’s demand (id.). The Company assumed that under the existing three-year efficiency program approved by the Department the amount of yearly incremental energy savings would reach a peak in 2015, and increase, albeit more slowly, between 2016 and 2020. The Company determined that, of NSTAR’s total energy efficiency savings over the period, 16 percent would accrue in the former Commonwealth Electric service area (essentially Lower SEMA), and of that amount, 55 percent would occur in Tremont East (Exh. NSTAR-GMR-2, at 4). The Company translated the anticipated efficiency savings (in kWh) into peak demand reduction (in MW) by using a ten-year average load factor, and a 5.2 percent system loss factor (Exh. NSTAR-GMR-2, at 3). For Tremont East, the Company determined that cumulative demand reductions attributable to ongoing efficiency programs would increase from 6 MW in 2011 to 69 MW in 2021 (id. at 9).

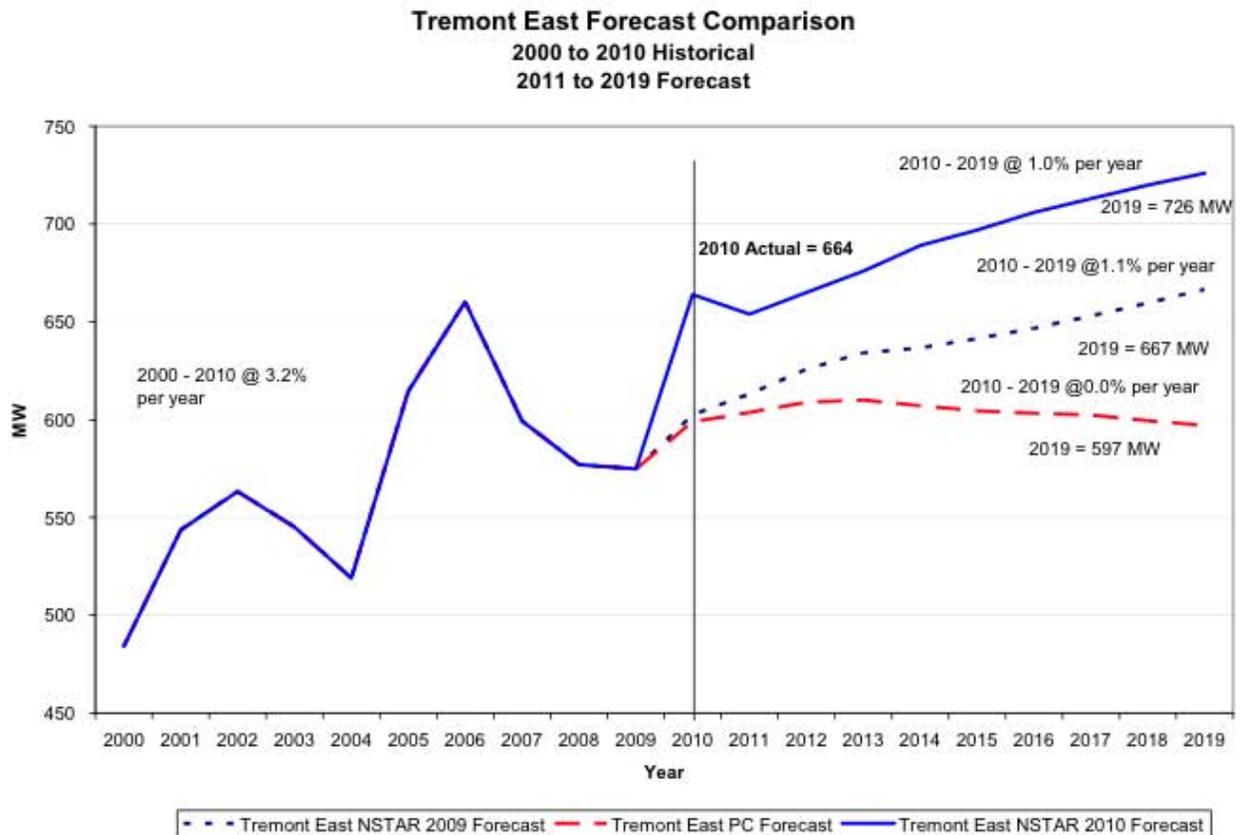
In its Petition, the Company initially presented a 2009 peak load forecast that predicted 90/10 peak loads in Tremont East of 602 MW in 2010 rising to 667 MW in 2019. During the course of the proceedings, the Company submitted an updated 2010 forecast acknowledging that the actual 2010 peak for Tremont East reached 664 MW under rather extreme weather conditions described by the Company as 96/4 (Exh. NSTAR-GMR-2, at 20). The 2010 peak load forecast ranged from the actual peak of 664 MW in 2010 to 726 MW by 2019. According to the Company, the increase in the peak load forecast better reflects immediate load growth patterns evident in the Tremont East area (id.). A graph comparing the 2009 and 2010 Company peak forecasts, as well as that of Sandwich witness Paul Chernick (labeled “Tremont East PC

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<sup>15</sup> A 90/10 forecast is based on 90% chance that actual peak loads would be less than estimated loads largely as a function of weather conditions such as temperature and humidity

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Forecast”), is shown below. The percentage values noted for each forecast are the compound annual growth rates (“CAGR”) for the 2010 – 2019 period.



(Exh. NSTAR-GMR-2, at 22)

NSTAR did not account for small distributed generation facilities (e.g., behind-the-meter generators) separately in the Company’s peak load regression analysis. The Company noted that any smaller distributed generation facilities present in the historical data would have already been implicitly included in the Company’s analytical approach (Exh. NSTAR-GMR-2, at 23). With respect to larger distributed generation facilities, the Company noted that such resources would be considered like other larger generators in the need analysis – only to the extent that they clear the forward capacity market and provide reliable capacity (id. at 23).

#### b. Contingency Analysis

Consistent with the reliability criteria established by NERC, NPCC and NEPOOL/ISO-NE, NSTAR performed a contingency analysis to assess the ability of the local area transmission system to withstand double-contingency outages given projections of peak-load

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(described *supra*), generator availability, and dispatch conditions (Exh. NSTAR-1, at 2-23). The Company's contingency analysis determined that critical transmission lines and other system elements would experience overloads under contingency conditions currently and continuing through 2013 (the five-year horizon) and 2018 (the ten-year horizon), and it calculated the magnitude of such contingency overloads on the specific transmission elements (*id.*).

i. Transmission Line Ratings

The first step of the contingency analysis involved the Company's evaluation of the thermal capability of each element according to its normal rating, long-term rating, and short-term rating (*id.* at 2-24). The "normal" rating for a transmission element is the continuous operating limit; the "long-term emergency" ("LTE") rating is the 12-hour capability of the element under peak-load conditions, which assumes that any loading affecting this line will last no more than 12 hours; "short-term emergency" ("STE") rating is the 15-minute capability of the element, although in practice the Company would have only about five minutes or less, depending on the overload, to alleviate the overload, which means that the Company must take immediate action to shed load. The Company performs its N-1-1 contingency analysis based on the LTE ratings, which is presumed to permit the Company sufficient time to dispatch crews and make repairs when problems occur (*id.*).

ii. Generation Availability

As required by NERC, NPCC and NEPOOL/ISO-NE reliability criteria, the Company performed the contingency analysis by first establishing designated base-case conditions for 2013 with "reasonably stressed" generation unit dispatches in the study area (*id.*). NPCC, NERC and ISO-NE reliability standards require that the contingency modeling assume conditions that "stress" the system before beginning to test it with contingencies. For example, ISO-NE Planning Procedure No. 3 ("PP-3"), Reliability Standards for the New England Area Bulk Power Supply System, states:

With due allowance for generator maintenance and forced outages, design studies will assume power flow conditions with applicable transfers, load, and resource conditions that reasonably stress the system.

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Section 5.2 of ISO-NE Planning Procedure 5-3, Guidelines for Conducting and Evaluating Proposed Plan Application Analyses (“PP 5-3”), defines “Reasonably Stressed Conditions” as follows:

Reasonably stressed conditions are those severe load and generation system conditions which have a reasonable probability of actually occurring. Generally both import and export conditions should be addressed. The purpose of testing these conditions is to identify potential weaknesses in the system and not to test the worst imaginable extreme.

The Company developed three generator dispatch scenarios for the Lower SEMA area to assess transmission system loading conditions relating to “generator unavailability” that could occur coincident with transmission-element contingencies:

| Base Case - 2013 |                       |                       |                       |
|------------------|-----------------------|-----------------------|-----------------------|
| Units            | Dispatch 1            | Dispatch 2            | Dispatch 3            |
| <b>2013</b>      | <b>2013_Dispatch1</b> | <b>2013_Dispatch2</b> | <b>2013_Dispatch3</b> |
| Canal 1          | 559                   | 559                   | -                     |
| Canal 2          | -                     | 553                   | -                     |
| Pilgrim          | 685                   | 685                   | 685                   |
| Cape Wind        | -                     | 476                   | -                     |
| SEMASS           | -                     | 67                    | 67                    |
| Dartmouth        | -                     | 61                    | 61                    |
| Fore River       | 667                   | 667                   | 667                   |
| Somerset 6       | 105                   | 109                   | 109                   |
| Dighton          | -                     | 140                   | 140                   |
| Taunton          | -                     | 131                   | 131                   |
| Tiverton         | -                     | 245                   | 245                   |

(Exh. NSTAR-1, at 2-26)

### iii. Load-Flow Analysis

To determine whether transmission elements would become overloaded under the NEPOOL/ISO-NE reliability criteria, the Company simulated the failure of one or two transmission elements on the system. To perform this analysis, the Company compiled a list of the transmission elements on the system, such as transmission lines, transformers and breakers, and then ran a series of simulations to test the transmission system using the base-case generation scenarios, and the outage of these transmission elements. These simulations allow the Company to model the load flows and voltages on all other transmission elements in the event of each contingency, and to perform technical evaluations of the system’s capacity to meet normal and emergency operating requirements (Exh. NSTAR-1, at 2-26).

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c. Results of Contingency Analysis

The thermal and voltage results presented by the Company indicate that the two 115 kV transmission lines serving the Tremont East area would experience the most significant overload conditions with the loss of the 345 kV Lines 342 and 322, under the N-1 and N-1-1 contingencies. Specifically, the loss of these two 345 kV lines would result in overloading of 115 kV Lines 108 and 113 to 149 percent and 137 percent, respectively, of the LTE rating under summer peak load conditions in 2013, without either of the Canal units operating, and Cape Wind unavailable for dispatch (*id.* at fig. 2-2, p. 1). Based on these loading levels, the transmission system operators would have fewer than five minutes to evaluate the system condition and take action to avoid permanent damage to the 115 kV lines and voltage collapse. Use of the 2010 updated peak load forecast would significantly worsen the situation. The Company concluded from the contingency analysis that it is vital that reinforcement of the transmission system in this area be completed as soon as possible (*id.* at 2-33).

D. Positions of the Parties

Sandwich, and its witness, Paul Chernick, assert that NSTAR has failed to meet its statutory burden to demonstrate a need for the project through a load forecast for electric power demand based on historically accurate information, reasonable statistical projection methods, and adequate consideration of conservation and load management efforts (Sandwich Initial Brief at 1). Sandwich contends that NSTAR's load forecasting methodology is rife with errors, unexplained anomalies, and fails to appropriately reflect established policies of the Commonwealth regarding energy efficiency and renewable and distributed generation resources that can further reduce loads and offset system demands (*id.* at 2). Sandwich faults NSTAR for providing very little forecast documentation with its Petition and responding slowly and incompletely to repeated discovery requests for such documentation, and introducing a new forecast late in the proceeding. That the peak load forecast shifted upward so significantly from 2009 to 2010 suggests to Sandwich that the methodology is unreliable and not accurately predictive (Sandwich Initial Brief at 31).

With regard to energy efficiency assumptions in the load forecast, Sandwich asserts that NSTAR's approach is flawed because it: (1) uses a loss factor that is too low; (2) is unclear whether NSTAR has fully taken account of Cape Light Compact's energy efficiency efforts; (3) ignores the fact that projected energy efficiency savings MWs would be higher under peak

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load conditions than under normal conditions; and (4) inexplicably assumes that incremental energy efficiency savings will begin to diminish by 2015, despite strong policies of the Commonwealth to the contrary (Sandwich Initial Brief at 17). Sandwich also asserts that the load forecast is flawed because smaller distributed generation resources, that often operate behind-the-meter and reduce customer net loads, were not accounted for at all. Sandwich disputes the Company's logic of excluding such generators because of their intermittency. Sandwich notes the Cape has many renewable and distributed generation projects announced or under development, and that such projects are growing rapidly in response to Commonwealth laws, regulations and programs (Sandwich Comments on Issues Memorandum at 8-9).

Sandwich also disputes the need for the Project based on numerous aspects of the contingency analysis performed by the Company including the exclusions of both Canal units and Cape Wind in certain dispatch scenarios, and what the Town views as extremely remote probabilities that both of the 345 kV lines serving Tremont East would be sequentially out of service. Mr. Chernick calculated that, based on data provided by the Company, the loss of both 345kV lines would occur only once in 88.5 years (Sandwich Initial Brief at 11). Sandwich asserts that the high costs of the Project, and extremely low probability of it ever being necessary in actual practice, should compel the Siting Board to reject the Project. Even if the contingencies were to occur despite the long odds, Sandwich contends that limited load shedding is both a permissible and acceptable approach that would avoid the excessive Project costs. Sandwich contends that the Company's assertions of Project need inappropriately rely on "alleged urgency, scare tactics and the resulting parade of horrors" (*id.* at 9).

ISO-NE asserts that its regional transmission planning process determined a reliability need in the Lower SEMA areas, and identified the Project as the preferred solution to meet that need (ISO-NE Initial Brief at 17). In its Long Term Needs Assessment, ISO-NE's working group looking at Lower SEMA identified a number of weaknesses including thermal and voltage violations, inadequate transfer capability resulting in constrained imports and exports, and stability concerns. ISO-NE contends that these evaluations reflected ISO-NE's "considerable expertise and experience in transmission system planning and operation . . . and relied upon assumptions and parameters that have been reviewed and vetted by various stakeholder and regulatory participants through the open PAC [Project Advisory Committee] process" (ISO-NE Comments on Issues Memorandum at 3). Moreover, ISO-NE asserts that, even without growth

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in load, the Lower SEMA transmission system has been shown inadequate to meet reliability criteria – even under existing load conditions (ISO-NE Initial Brief at 18).

GenOn asserts that the need identified by NSTAR for the Project is, “at best, premature and overstated” (*id.* at 7). While its initial concerns in this proceeding centered around the evaluation of Project alternatives, particularly quick-start generation at the Canal site, GenOn stated that it became evident that NSTAR’s peak load forecasts are not reliable, as evinced by the 2010 actual peak loads for Tremont East arriving six to eight years early relative to the 2009 forecast. GenOn contends that these forecast inaccuracies are “rather stunning” and that “the urgency of need cannot be justified by NSTAR’s unreliable peak forecasting methodology” (GenOn Reply Brief at 24).

GenOn contends that many of NSTAR’s assumptions in its need analysis are contrary to the Commonwealth’s public policy goals. Among the shortcomings cited by GenOn is a failure of NSTAR to consider any combined heat and power, community wind projects, or photovoltaic projects generating on Cape Cod that have not already cleared the FCM. Similarly, GenOn notes that NSTAR seems to use an outdated view of the role of efficiency in the supply mix going forward, with yearly incremental savings peaking in 2015 and then tailing off. GenOn argues that these extreme assumptions cannot be reconciled with the multitude of legislative mandates in Massachusetts to increase the contribution of those types of resources in the Massachusetts supply mix (GenOn Initial Brief at 16). This result is even more troublesome, GenOn asserts, because ratepayers bear the cost of regulations and programs to bring such resources to market, and would also have to pay the cost of “redundant resources for contingency protection” such as the Project (*id.*).

The Attorney General asserts that NSTAR has shown that its load forecast is based on substantially accurate historical information and reasonable statistical projection methods and is reviewable, appropriate and reliable (Attorney General Initial Brief, at 9-10). She further contends that NSTAR has shown through its analyses that the existing system does not meet applicable reliability criteria under normal operating conditions and under N-1 and N-1-1 contingencies for projected load (*id.* at 20). Given the potential for Canal units to be run out-of-merit to address the reliability requirements in Tremont East, the Attorney General sees the Project supported by economic efficiency grounds as well as reliability considerations.

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Accordingly, the Attorney General asserts that the Company has demonstrated that there is a need for the Project (id. at 21).

NSTAR asserts that the load flow modeling evidence demonstrates that its proposed project or at least some additional energy resources are needed because its transmission system in Lower SEMA does not comply with reliability standards established by NERC. The Company argues that need is established as long as net peak load in Tremont East is over 460 MW, and peak loads have been over 600 MW for years. Given these actual loads, NSTAR states that distributed generation and load reductions from demand-response programs will be insufficient to reduce net peak load in Tremont East to any level even close to the 460 MW limit. In addition, it argues that electrical load in the area will grow over the next decade making the reliability need greater.

E. Analysis and Findings on Need

In sorting through the many issues that the parties have raised concerning the Company's demonstration of need, some appear to be fundamental methodological questions while others are more narrowly focused technical disagreements, or even judgment calls among the hundreds of such choices that go into collecting data, structuring models, and assessing the results for a need demonstration. Before addressing these issues, however, we note the fundamental importance of one key fact that is not in dispute in this case: in 2010 the Tremont East area experienced an all-time-high peak load level of 664 MW on an extraordinarily hot and humid summer day that was a statistical rarity – a one-in-25-year occurrence (or 96/4). This, level of peak demand was not anticipated in the Company's initial Petition to occur until after 2018.

The significance of this real-world extreme occurrence to the Siting Board's review of need cannot be overstated. It shows that the forecasting results initially presented by the Company, whatever their flaws, clearly did not reflect the most challenging peak load conditions that could arguably have been used in the contingency analysis of its system in Lower SEMA and Tremont East. It should also be noted that, while the deterministic scenarios and methodologies that underlie contingency analyses inherently tend towards the improbable, as asserted by Mr. Chernick, in this instance, actual weather conditions were far more challenging than the 90/10 weather assumptions specified for use by reliability planning standards and industry protocols. In fulfilling its statutory responsibilities to ensure reliable electric service, the Board views as entirely appropriate placing significant weight on actual loads that

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demonstrate a credible, material and potentially recurring threat to system reliability and not necessarily relying solely on projections and modeling for purposes of making a need determination. See National Grid Worcester, EFSB 09-1/D.P.U. 09-52/09-53, at 6, n.7.

As noted by GenOn, the “rather stunning” disparity between the initial projections of peak loads in Tremont East, and the actual experience in 2010 clearly exemplifies why the reliability of the load forecast has proven to be a major issue in this case, with a number of criticisms presented primarily by Sandwich and GenOn. Sandwich takes exception to the Company’s treatment of energy efficiency-related peak demand reductions, and smaller distributed generation resources that are typically “behind-the-meter” (Sandwich Brief at 17-21). The essence of these criticisms regarding energy efficiency is that the Company has taken a “known and measureable” approach by assuming that such savings will accrue primarily from existing and approved program budgets rather than any expectation of future program investments.

The Siting Board notes that these highly cost-effective energy efficiency programs are now well-established policies of the Commonwealth, as reflected in the Green Communities Act, the Global Warming Solution Act and longstanding Department case precedent and programs as well as those of other Commonwealth agencies. There is no substantiation for the Company’s assumption that incremental energy savings and related peak-load reductions from these groundbreaking programs will plateau around 2015 and decrease thereafter. Nevertheless, the Company’s caution is not entirely misplaced, but a preferable approach would have been to submit sensitivity cases that offered a more robust outlook on the continuing effectiveness of these programs, given not just the investment of public funds, but the likelihood of future regulatory changes affecting energy use and technological progress in this area. Arguably, yearly incremental energy savings could just as easily have continued accelerating over the forecast period as peaking and then decelerating.

With regard to net-metered distributed generation sources that serve as an offset to net customer loads, the Company contends that it did not separately identify this growing resource in its forecast, although it argues that distributed generation is embedded in the regressed relationships of historical data. Here again, the Company’s methodology falls short of faithfully reflecting established laws and regulations of the Commonwealth, such as the Solar Carve Out, that are now beginning to deliver megawatts of new resources in Tremont East (Sandwich

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Comments on Issue Memorandum at 9). Given the uncertainties associated with siting and building any generation resources, distributed or otherwise, this area also lends itself to the use of sensitivity cases to explore reasonable parameters of future program effectiveness.

Larger renewable resources – such as Cape Wind, that must bid into ISO-NE energy markets to supply the grid – were treated by the Company like other central station generators, that is, on the supply side in load flow modeling, rather than as an offset to end-use customer loads typified by smaller, net-metered resources. For Cape Wind, in particular, the Siting Board notes that the Company’s approach used different base-case generation scenarios, including one dispatch with the full anticipated capability of Cape Wind and two dispatches with zero generation, reflecting the intermittence of the resource. The Board finds that a third scenario based on partial-load operation, would have added additional value to the simulation.

The Board agrees with the Company’s decision to include some dispatch scenarios that had both Canal units off-line. Since 2006, the Canal units seldom operated in economic merit, because of the price disparity between natural gas and residual oil. Witnesses debated whether the price disparity would continue at recent levels, but not one witness predicted that the price disparity would disappear entirely. As a result, in accordance with current practices, the Canal units are both likely to be off-line at the time of an N-1-1 contingency on the 345 kV lines, even at most times when loads are above 460 MW – which is the transfer limit of the two 115 kV lines that feed Tremont East.

Another area of considerable debate regarding Project need is the relevance of probabilistic assessments and whether they can be properly ascertained during Siting Board reviews, given the complexities of power grids and the resources that feed them, coupled with the dictates of reliability planning that are largely grounded in deterministic approaches.<sup>16</sup> The Siting Board understands the well-established use of deterministic methods in the evaluation of system reliability needs and views their use as appropriate for such purposes. In reviewing this issue, the Board finds that the probabilities associated with relevant system contingencies, or the resulting likelihood of load-shedding outages, are not really questions of whether need for a

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<sup>16</sup> As noted above, the use of 90/10 peak load forecasts in reliability planning is a clear illustration of a probabilistic concept that is, in fact, an accepted part of established planning procedures. In 2010, this parameter was eclipsed by actual events that involved 96/4 extreme weather conditions.

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resource exists – but rather, of how that need is dealt with. Accordingly, we address this issue in Section IV, below.

ISO-NE has asserted that as the regional transmission planning reliability authority, its planning procedures, studies, and findings on reliability should be accorded considerable weight, if not outright acceptance by the Siting Board. While the Siting Board welcomes and appreciates ISO-NE's active involvement in this proceeding, we cannot ignore that this is an adjudicatory proceeding and facts in Siting Board cases must be presented to substantiate arguments; the Board then evaluates those facts and arguments as to their decisional relevance and weight.

While the 2010 peak load forecast suffers from many of the same limitations as the initial 2009 forecast, we find that it is minimally sufficient for use in this proceeding to evaluate the Company's assertion of need. Given that the load flow models showed significant thermal and voltage violations using the much lower 2009 forecast, and that the estimated peak load for 2018 was already breached in 2010, the accuracy of the forecast proves not to be critical to our decision that contingency planning demonstrates a need for energy resources, and that some action must be taken.

We also support the Attorney General's perspective that economic efficiency, as well as reliability, has relevance to a finding of need. While the \$316 million of out-of-merit dispatch costs for running Canal units for reliability purposes halted in August 2009 following the short-term measures, the possibility exists that ISO-NE could once again force Canal units to operate in this manner to the great financial detriment of SEMA ratepayers who would shoulder the above-market costs, as they did previously. Alleviating the risk of such costs returning to the bills of SEMA ratepayers is indeed an economic benefit that fulfills the Siting Board's "economic efficiency" rationale for project need.

We concur with the Company, ISO-NE and the Attorney General that an N-1-1 contingency of sequentially losing both 345 kV lines serving Tremont East is a combination that NERC requires NSTAR to evaluate. Modeling of the transmission system, with the Canal units typically turned off and with electric flow into the area greater than 460 MW, shows that thermal overloads and low voltage conditions, perhaps even voltage collapse, would ensue under N-1-1. In other words, the "firm transmission capacity" of the existing transmission system after an N-1-1 loss of two transmission elements is approximately 460 MW.

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Peak loads in Tremont East have exceeded 460 MW since 1994. There is no credible evidence in the record that peak net load levels will be significantly reduced in the future. Thus, even with a minimally sufficient load forecast, the Board concludes that future peak loads in Tremont East will continue to significantly exceed 460 MW. Accordingly, NSTAR's load flow modeling of the performance of its Lower SEMA transmission system at loads of 601 to 662 MW is consistent with recent actual loads and was reasonable and proper.

The Siting Board views the ability to posture the system after the loss of one of the 345 kV lines, made possible by the short-term measures, as an additional energy resource and therefore a potential means to solve the transmission need indicated by the load flow modeling. Especially since it may be combined with one or more non-transmission alternatives, system posturing may provide or at least be an integral part of the optimal solution that meets the reliability need in the Tremont East area. Without at least posturing the system after a first contingency loss, Tremont East would be subject to thermal violations and voltage collapse after a second contingency at high loads. For these reasons, the Siting Board finds that additional energy resources are needed for Tremont East.

#### 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: (a) other methods of transmitting or storing energy; (b) other sources of electrical power; or (c) a reduction of requirements through load management.<sup>17</sup> In implementing its statutory mandate, the Siting Board requires a petitioner to establish that, on balance, its proposed project is superior to alternative approaches in terms of reliability, cost, and environmental impact in its 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. National Grid Worcester, EFSB 09-1/D.P.U. 9-52/9-53, at 19; GSRP, EFSB 08-2/D.P.U. 08-105/08-106, at 32; Cambridge Electric Light Company, 12 DOMSB 305, at 321 (2001) (“CELCo/Kendall”).

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<sup>17</sup> G.L. c. 164, § 69J also requires an applicant to present “other site locations.” This requirement is discussed in Section V.A, below.

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B. Project Approaches Identified by NSTAR

In its initial Petition, NSTAR presented ten potential approaches (including the Project) that could conceivably meet the need identified by the Company. NSTAR determined that two of the alternatives did not meet or could not “reasonably meet” the identified Project need and, therefore, NSTAR did not analyze them further in its Petition. However, all ten of the Project approaches are presented below.<sup>18</sup>

1. Non-Transmission Alternatives Identified by NSTAR

a. “Do Nothing” Alternative

According to NSTAR, Canal Station has been dispatched out of merit historically to provide coverage for second contingency events, such as the potential loss of the 345 kV lines serving Tremont East. NSTAR’s “no-build” alternative would require that Canal Station run out of merit on heavy load days when peak demand exceeds the transmission system capabilities in Lower SEMA (Exh. NSTAR-1, at 3-5). The Company stated that “NSTAR ratepayers in Lower SEMA would continue to pay the cost of this out-of-merit operation” which would worsen as load in Tremont East continues to grow (*id.*). In the longer term, NSTAR voiced concern that the two aging Canal units could require substantial modifications in response to changing USEPA requirements for once-through cooling technology, that might lead to the units “being removed from service.” NSTAR contends that the do nothing alternative “does not meet the project need, and was, therefore, eliminated from any further consideration” (*id.* at 3-6).

b. Quick-Start Conventional Generation Alternative

NSTAR evaluated an alternative of installing two General Electric 7FA frame gas turbine units at the Canal site, which would have a combined summer rating of 314 MW (Exh. NSTAR-1, at 3-7, 3-22). NSTAR stated that these turbines would provide more than the 248.4 MW of additional Installed Capacity (“ICAP”) necessary to satisfy double contingency reliability requirements through the end of the 2022 planning period, and that it would be the least expensive quick-start gas turbine option (Exh. NSTAR-1, at 3-7).

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<sup>18</sup> Several of the alternatives identified by NSTAR were of considerable interest to other parties in the proceeding, who relied on interrogatories, cross-examination, and, in some cases, direct testimony to develop and put forth their own views and proposals regarding Project alternatives. These are described in Section IV.D, below, and ultimately became the focus of the discussion in this proceeding regarding Project alternatives.

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NSTAR consultant Levitan and Associates, Inc. (“Levitan”) estimated that the capital cost required of the quick-start turbine generation owner would be approximately \$365 million (id.). Levitan estimated the present value cost of the GE 7FA frame units (accounting for energy sales revenue and energy price suppression) at \$182.4 million, versus \$85.7 million for the proposed Project (id. at fig. 2-11). Given this cost disparity, NSTAR noted that “the quick start generation is inferior to the proposed transmission solution” (id. at 3-7).

With regard to environmental impacts, NSTAR concluded that, with assumed construction at the existing Canal site, the quick-start turbine units would entail only limited temporary environmental impacts (id. at 3-22). Once operational, NSTAR noted that the units would produce incremental air pollution and have a higher heat rate than would a combined cycle generator (id.).

c. Demand Response Alternative

NSTAR stated in 2010 that there were 7.4 MW of Real Time Demand Response (“RT DR”) resources that can be activated within 30 minutes in Tremont East (Exh. NSTAR-1, at 3-7). Levitan estimated that 20.1 MW of RT DR resources had cleared the forward capacity market for 2012 (id. at 3-8). According to the Company, a Project alternative relying solely on RT DR would necessitate an additional 160 MW of RT DR for 2012, with subsequent increases to match projected load growth (id. at 3-9). NSTAR stated that this level of Demand Response in Tremont East is far beyond the market penetration levels achieved in New England or any other region. Levitan provided an extrapolated cost estimate of the required RT DR levels, which was a present value of \$266 million (id.; Exh. NSTAR-1(2-1) at 51). NSTAR noted that, because there is proportionally less industrial and large commercial load in Tremont East, the RT DR potential in Tremont East would be even more limited than in other areas, making the alternative infeasible (Exh. NSTAR-1, at 3-9, 3-10).

NSTAR stated that there would be no temporary or operational environmental impacts, provided that the full requirement for RT DR is met by load shedding rather than emergency generation (id. at 3-22). Further, NSTAR stated that there would be an avoided emissions benefit (id.).

d. Renewable Energy Generation

As of September 2010, NSTAR reported a total capacity of existing renewable energy projects of about 3.3 MW, mostly from wind, within Tremont East, with proposals for another 40 MW or so of land-based wind turbines (Exh. NSTAR-1, at 3-10). The proposed Cape Wind project would have a maximum output of 468 MW and an anticipated average annual output of 170 MW (*id.* at 3-11, n.17). NSTAR asserted that, because wind and solar projects are intermittent, these renewable energy sources do not contribute to firm power supply for a given area at any specific time, although they would produce energy over the course of the year (*id.* at 3-12). NSTAR concluded that renewable energy generation would not meet the need and did not consider the alternative further.

2. Transmission Alternatives Identified by NSTAR

a. The Proposed Project

The Company included the proposed Project, as described in Section I.A, above, among the other Project alternatives for economic and environmental evaluation and comparison purposes (Exh. NSTAR-1, at 3-22). NSTAR estimated the capital cost of the proposed project at approximately \$102 million, for the Company's preferred route (*id.* at 3-14; Tr. 4, at 587).<sup>19</sup> The estimate includes contingency of about \$5 million (Tr. 4, at 646). NSTAR did not otherwise have an estimate of the accuracy of the estimate (*i.e.*, range of error) (*id.*). NSTAR submitted a request to have the cost paid through the regional transmission tariff, and ISO-NE has granted the request (Exhs. EFSB-C-2(S2); EFSB-C-2(1)(S2)). For comparison with other alternatives, NSTAR estimated the revenue requirement for the Project for the first year at about \$16.6 million (RR-EFSB-11).<sup>20</sup>

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<sup>19</sup> The \$102 million figure does not include an \$8.3 million cost item for separating the two existing 345 kV circuits that are on shared structures for the crossing of the Cape Cod Canal onto separate structures (Tr. 4, at 587). The circuit separation would occur with any alternative (*id.*), so it is omitted from the comparison. A subsequent Project figure of \$106 million (\$98 million without the circuit separation) was presented by the Company but the original figure is used here so that cost estimates for all alternatives are of the same vintage.

<sup>20</sup> Load in Massachusetts would pay about 46 percent of Project costs, of which about 23 percent would be paid by load in SEMA, of which less than half would be paid by what NSTAR characterized as the "benefitted load" in Tremont East (Tr. 4, 551).

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b. Carver to Bourne 345 kV Transmission

The Carver-to-Bourne 345 kV alternative would differ from the proposed project chiefly by locating a new 345 kV/115 kV substation near the existing Bourne Switching Station, and moving existing Bourne Switching Station functions to the new substation, instead of using the existing Line 120 to carry 345 kV power to an independent new 345 kV/115 kV substation in West Barnstable (Exh. NSTAR-1, at 3-15). The estimated cost was approximately \$140 million (id.). NSTAR stated that the temporary and operational environmental impacts of this alternative are limited, and comparable to those of the Project given the use of existing ROW. However, the reconstruction of the Bourne Switching Station means that there would be reliability risks during construction resulting from outages of six 115 kV lines (id. at 3-22).

c. Brayton Point to Cape Cod 345 kV Transmission

A Brayton Point-to-Cape Cod 345 kV alternative would link Lower SEMA to power sources in the Fall River area, would include about 40 miles of new transmission line, and would cost an estimated \$155 million to \$163 million, depending on whether it were tied to existing Line 120 and a new substation in West Barnstable, or tied to a new substation at Bourne (Exh. NSTAR-1, at 3-16). Some of the existing rights-of-way between Brayton Point and Bourne are relatively narrow and might need to be expanded to accommodate a new line (id.). NSTAR noted that the temporary and operational environmental impacts of this alternative are comparable to the Carver to Bourne alternative, as are the reliability considerations (id. at 3-22).

d. Transmission at 115 kV

NSTAR developed and evaluated a transmission alternative restricted to 115 kV lines and equipment. The option would include 35 miles of new, replacement, or upgraded transmission lines, some extending from Carver Substation through Tremont Substation to Bourne Switching Station, and a separate link in the New Bedford area (Exh. NSTAR-1, at 3-17, fig. 3-8). The option would require over 300 million volt-amperes reactive (“MVAR”) of reactive compensation for voltage support for high load periods, and station work at Bell Rock, Industrial Park, Mendall Road, Tremont, Carver, and Bourne substations (id. at 3-17). NSTAR indicated that the outages of existing lines required for this option would present a reliability risk during its construction (id. at 3-18). NSTAR estimated the cost at approximately \$170 million (id.).

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NSTAR noted that there would be temporary environmental impacts related to the significant expansion of the Carver Switching Station.

e. Submarine Cable, Pilgrim Station to Canal

This alternative would entail a 19-mile undersea 345 kV cable from the switchyard at Pilgrim Nuclear Station to Canal Substation, with an estimated cost of \$348 million (Exh. NSTAR-1, at 3-19). The environmental impacts noted by NSTAR include the disruption of 184 acres of seabed for the installation.

f. Submarine Cable, Seabrook Station to Canal

This alternative would use a 90-mile length of undersea 345 kV direct current cable from the Seabrook Nuclear Power Station in New Hampshire to Canal Substation; it would cost an estimated \$670 million (Exh. NSTAR-1, at 3-19). Environmental impacts would stem from placement of the cable in the seabed using a jet plow or alternative installation techniques.

3. NSTAR Assessment of Project Alternatives

NSTAR assessed the Project as having the lowest cost among the alternatives, and limited environmental impacts (Exh. NSTAR-1, at 3-21). NSTAR stated that terminating the 345 kV line in West Barnstable, rather than at Bourne, brings a strong power supply to the central area of Cape Cod (*id.*). On the basis of these merits, the Company selected the proposed project as the best solution to project need.<sup>21</sup>

C. Project Approaches Evaluated by ISO-NE

ISO-NE stated that it oversees New England's wholesale electricity markets, ensures the reliable operation of the regional power system, and conducts the regional transmission planning process (ISO Brief at 7). With the emergence of competitive generation markets, ISO-NE evaluates market responses to identified needs. If ISO-NE is not satisfied that market responses appear adequate to provide reliability support, ISO-NE will move forward in its planning process

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<sup>21</sup> The Siting Board agrees with NSTAR that none of the other nine project alternatives described and evaluated by the Company would be the preferable solution, for the reasons cited by NSTAR. See Section IV.F, below, for analyses of the additional alternatives evaluated in the proceeding.

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with stakeholders to address resource needs, with solutions that often include transmission projects (Tr. 10, at 1466).

In the Lower Southeastern Massachusetts Area Long Term Solution Study Report (“Solutions Report”) dated April 2010 ISO-NE identified the proposed Project as its preferred solution for identified reliability concerns from among the eight possible projects (Exh. ISO-FM at 3). Mr. Frank Mezzanotte of ISO-NE pointed out that ISO-NE’s process is not designed to evaluate a comprehensive range of resource alternatives (Exh. AG-ISO-1-7). Instead, ISO-NE evaluates transmission alternatives if no market responses “come forward” (*id.*).

#### D. Project Approaches Evaluated During the Proceeding

Parties in the proceeding relied on interrogatories, cross-examination, and, in some cases, direct testimony to develop and put forth their own views and proposals regarding Project alternatives. Through its discovery and examination, Siting Board Staff also explored the Company’s proffered alternatives as well as some additional approaches. The Project alternatives record developed by Staff and parties can be grouped in the following general categories: (1) load-shedding on the transmission system; (2) reducing net load in Tremont East through a combination of environmentally oriented actions such as demand-side measures (including efficiency and demand response) and supply-side resources (such as distributed generation and renewable resources); (3) operation of the existing Canal units during high load periods; and (4) construction of new gas turbine units proposed by GenOn for the Canal site (a modification of NSTAR’s “Quick-Start Conventional Generation” alternative). It should be noted these Project alternatives are not mutually exclusive, and that potentially, they could be combined into hybrid strategies to meet the identified need.

##### 1. Load Shedding

NSTAR provided information about load shedding in its Petition in its section on Project need, rather than as a Project alternative. As noted in Section III, above, the Siting Board views preparation for load shedding as an alternative to the Project.

Sandwich contends that load shedding is a reasonable response by ISO-NE and NSTAR to the “very unlikely” possibility of losing both 345 kV lines in a second contingency situation, which NSTAR uses as a basis of its Project proposal (Exh. SAN-PLC-1, at 24; Sandwich Comments on Issues Memo at 7). Sandwich’s witness Mr. Chernick noted that, prior to the

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short-term measures in Lower SEMA, the loss of both 345 kV lines without Canal units in operation “could bring down the transmission system in a large part of SEMA and require lengthy restoration procedures” (Exh SAN-PLC-1, at 22). Following the completion of those upgrades in the summer of 2009, Mr. Chernick contends “...the prospect of unlikely, limited, short-duration outages is no longer problematic” (*id.*). Mr. Chernick supported this contention by pointing to ISO-NE statements in the January 2009 “Long-Term Report of ISO New England Inc.” required pursuant to the FERC SEMA Settlement Agreement (“Long-Term Report”) that Tremont East can be postured so that load-shedding after a second contingency would be selective, meaning that up to approximately one-third of the Tremont East load could be shed on an N-1-1 contingency,<sup>22</sup> that an outage could be rotated within Cape Cod,<sup>23</sup> and that service could be served as demand subsidies when temperatures recede (*id.* at 23; Exh. EFSB-N-3(1) at 4-5, n.11).

As noted in Section III and described in the Long Term Report, ISO-NE, NSTAR, and National Grid committed to developing an operations guide that would incorporate posturing for load-shedding to maintain overall system reliability during contingencies, in lieu of dispatching the Canal units for LSCPR (Exh. EFSB-N-3(1) at 4-5). Mr. Chernick acknowledged that the Long-Term Report indicates that at the highest loads, or if loads grow, there is a risk of dropping the entire Cape load on the second contingency (Exhs. SAN-PLC-1, at 4; SAN-PLC-3, at 13). Mr. Chernick asserted that it would be reasonable for the Board to find the risk of such an event

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<sup>22</sup> According to ISO-NE’s 2009 Long-Term Report, operators can posture the Tremont East system selectively, after a first contingency, to drop up to approximately one-third of Tremont East load (*i.e.*, about 225 MW) on a second contingency (Exh. EFSB-N-3(1) at 4, n.11). When Tremont East loads are high enough that dropping 225 MW would not avoid voltage collapse on a second contingency, operators must posture the system to drop all customers east of Bourne Switching Station – *i.e.*, all customers on the Cape and Islands (*id.*; Exh. SAN-NSTAR-2-20). Mr. Chernick’s understanding is that net Tremont East loads over about 630 MW require this more severe posturing (Exh. SAN-PLC-1, at 24).

<sup>23</sup> NSTAR’s ability to shed load at individual stations, which could be used following a second-contingency loss of load, allows for rotation of a blackout (Exh. SAN-PLC-1, at 23, 26). Mr. Chernick quotes NSTAR as stating “Every load serving substation within NSTAR and Tremont East in particular can be shed individually from the transmission system by remotely or locally opening the step-down transformer breaker that supplies the substation” (*id.*, citing Exh. SAN-NSTAR-2-18).

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acceptable, due to its rarity.<sup>24</sup> Mr. Chernick contrasted the expected rarity of an N-1-1 outage with the reported frequency and duration of outages that Cape customers typically experience, 1.2 times per year, for a total of two hours without power per year (Exhs. SAN-PLC-1, at 24; SAN-PLC-3, at 10).

While taking issue with several aspects of the Load Interruption Guideline, Sandwich contends that, at peak loads of almost 700 MW, load shedding of less than 200 MW could be sufficient given the remaining capacity of the 115 kV lines, in conjunction with shifting some loads to other substations, demand response and local generation. Sandwich notes that this level of load interruption would be “well under the ISO Proposal limits” (Town of Sandwich Comments on Issues Memorandum at 6-7).<sup>25</sup>

## 2. Reducing Net Load

The parties in this proceeding generally acknowledge that a need for energy resources can be met in a variety of ways that may include non-transmission alternatives on both the supply-side and the demand-side of the electric power market. Demand-side resources include energy efficiency and demand response while supply-side resources include utility-scale generation resources, and a range of distributed generation technologies such as combined heat and power, renewables, and back-up or emergency generators. In its filing, the Company gave

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<sup>24</sup> Sandwich argues that with a book life of 40 years, the Project would have no more than a 1.6 percent chance of solving an outage in its lifetime, calculated from an outage interval for double outages at high load that it considers implausibly conservative of 2500 years (Sandwich Comments on Issues Memo at 5). Using another set of assumptions of outage likelihood that he also considered implausibly conservative, Mr. Chernick extrapolated that load shedding is economically preferable to the Project if avoiding an outage is worth less than \$100,000 per customer (Exh. SAN-PLC-3, at 5).

<sup>25</sup> Sandwich acknowledges that the actual configurations of the Tremont East substations could present a difficulty in limiting how much load would need to be shed. Given that some of the substations are served by both 115 kV and 345 kV lines, it may be difficult to posture them for the second contingency without overburdening the remaining 115 kV system. The Town calls this a “design decision” by NSTAR that prevents the 115 kV system from providing its full measure of load carrying capacity in the event of an N-1-1 contingency. To address this limitation, the Town urges NSTAR to develop its “evolving Smart Grid infrastructure to quickly change switch settings remotely and minimize loss of load, in the extremely rare event of a double 345 kV outage at a peak hour” (Sandwich Comments on Issues Memorandum at 7).

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some consideration to these alternative approaches, and concluded that most were not feasible alternatives, and that none was superior to the Project based on cost, reliability and environmental impacts. In contrast, Sandwich and GenOn put forth specific proposals and arguments favoring these non-transmission alternatives, and challenging the Company's selection of the Project.<sup>26</sup>

Mr. Chernick recommends that the Board reject NSTAR's Petition in favor of what he describes as a "least cost solution for meeting those needs, including enhanced energy-efficiency programs, local renewables, combined heat and power ("CHP"), demand response and distributed generation" (Exh. SAN-PLC-1, at 4, 5). In Mr. Chernick's view, aggressive pursuit of these resources could mitigate peak loads, but would not eliminate the possibility of dropping some load on a second contingency. Thus, a more feasible approach to reducing net load combines it with load posturing as described above. Mr. Chernick contends that ISO-NE procedures for addressing a resource need should ensure that a least-cost solution be supported by the same loads that would pay for a transmission solution (*id.* at 5). He advises that if a need for additional resources develops in future years, NSTAR should establish a multi-party process to determine the least-cost solution, including non-transmission alternatives (*id.* at 4, 5).

Based on his extrapolation of existing efficiency programs, Mr. Chernick contends that the Company's projection of energy efficiency savings in Tremont East is understated by about 30 MW in 2013 and 75-80 MW in 2018. Peak loads could be even lower, he asserts, by increasing incentives for demand response in Tremont East, and by making deeper investment in energy efficiency in Tremont East. As for supply-side resources, Mr. Chernick again finds that the Company has understated the potential contribution that renewables and CHP could or should provide in Tremont East, thereby reducing the need for new transmission. In particular, he suggests that NSTAR take actions to encourage development of these resources including giving preferences to resources in Tremont East and assisting customers in developing projects. He notes that in its recent renewables RFP, NSTAR was offered at least two projects in Tremont East, as well as capacity from Cape Wind, but chose projects outside Tremont East, and mostly outside Massachusetts.

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<sup>26</sup> Non-transmission alternatives include the use of Canal Station, in its current form, or as the site of new quick start gas turbines. These specific topics are addressed in separate sections *infra*.

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### 3. Operation of Existing Canal Units

As noted above, there are two existing large generation units at Canal Station. If either unit is generating power at the time of an N-1-1 contingency involving the two 345 kV lines that cross the canal, no thermal or voltage violations would ensue (and no load would be dropped). Since the units are typically out-of-merit even at relatively high load levels, customers would have to pay the LSCPR for operating the units. The Canal units are not well-suited for peaking operation because they require most of a day to ramp up to produce power. As a result, to provide a full measure of local contingency reliability, system operators would have to call up the units in advance, incurring LSCPR costs, when temperatures and loads are forecast to be high.<sup>27</sup>

To better estimate costs to consumers of operating the existing Canal units to avoid violations or loss of load, Staff requested that ISO-NE calculate what it would have cost in 2010 to operate a Canal unit on days when loads could have been predicted to exceed the capacity of the two 115 kV transmission lines. ISO-NE estimated that the cost to run one Canal unit for reliability purposes, instead of being prepared to shed load on a second contingency, would have been approximately \$37 million in 2010 (RR-EFSB-ISO-4). Of this amount, about \$17 million would have been recovered in energy sales, and the remaining \$20 million in uplift costs would be allocated to customers (RR-GEN-ISO-3). According to ISO-NE, the uplift cost would be borne by Lower SEMA ratepayers (*id.*). GenOn disputed the estimate<sup>28</sup> and suggested that a more accurate net cost for running Canal for LSCPR might be \$10 million per year (GenOn Brief at A-8).

Regarding the impact of environmental regulations on the Canal units, GenOn evaluated the requirements and “hypothetical modes of compliance with the pending regulations under Section 316(b) of the Clean Water Act, the Cross-State Air Pollution Control Rule” and the Maximum Achievable Control Technology for Utility Air Toxics (“MACT”) Rule (*id.* at A-4).

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<sup>27</sup> Having a Canal unit operating at times of high load would mean that this alternative would also provide protection in the event of a simultaneous (N-2) outage of two 345 kV lines.

<sup>28</sup> ISO-NE stated that it estimated Canal’s costs using sensitive market information. ISO-NE had concerns about distribution of sensitive market information even subject to a protective order. Staff did not seek to obtain access to the sensitive market information. As a result, parties and Staff were not able to review the details of the ISO’s estimate.

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GenOn contends that, the Cross-State Air Pollution Control Rule does not apply to generators in Massachusetts, and that the MACT Rule will not affect either of the units given electrostatic precipitators already present and the units' low capacity factors (*id.*). For 316(b) compliance, GenOn asserts that Canal Station will be able to comply with the final rules with some minor operating limitations and minor expenditures for upgrades to existing intake screens (*id.* at A-5).

#### 4. New Generation at Canal

To address the Tremont East reliability needs identified by NSTAR, GenOn proposed to construct by January 2015, two 198.5 MW Siemens SGT6-5000F(3) gas-fired quick-start turbines, with ultra-low sulfur distillate ("ULSD") as a back-up fuel ("GenOn gas turbines") (Exh. GENON-SK-1, at 3). These units are designed to reach 300 MW of output in ten minutes and full load output of 398 MW in twelve minutes (*id.*).<sup>29</sup> GenOn would construct these units at the existing Canal site, which it argued is a sensible location given the site already houses appropriate infrastructure such as fuel storage and grid connections and power generation is an activity that enjoys local support (*id.* at 8, 9; Tr. 8, at 1027). GenOn witness Dr. Ira Shavel found that, relative to NSTAR's Project, the GenOn gas turbines would reduce costs for Massachusetts and New England ratepayers by \$144.3 million and \$446.3 million, respectively, during the 2013 – 2022 planning period. GenOn attributed the savings to displacing higher cost oil- and gas-fired generation, and the resulting price suppression of the New England electric market. (Exh. AG-GENON-1-3(b)).

GenOn's gas turbines would require financial support in the form of a long-term contract, as GenOn maintains that the project is not feasible with market income alone (Tr. 8, at 1121). GenOn estimated the total cost to construct its proposed gas turbines at either \$266 or \$279 million (in 2011 dollars), depending on its contracting approach (Exh. GENON-SK-1,

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<sup>29</sup> GenOn asserted that despite repeated efforts, it was unable to persuade ISO-NE to include a quick-start generation solution for inclusion in the 2009 Long-Term SEMA Study, nor did ISO-NE undertake an economic study of the Canal repowering proposal as requested by GenOn in 2009. GenOn's contends that NSTAR also rebuffed its attempts to discuss the proposed solution and contract terms and refused to "discuss or consider any proposal from GenOn" (GenOn Initial Brief, at 22). NSTAR's witness Robert Clark, Director of Transmission Business Strategy, attempted to explain that refusal by indicating, in essence, that if an option is not considered by ISO-NE in the transmission planning process there is no need for NSTAR to consider it (Tr. 2, at 289).

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at 6). Fixed operations and maintenance costs were estimated to be approximately \$4.9 million per year (*id.*). GenOn stated that it would be willing to enter into a fixed-price contract for construction and operation of its facilities, such that any construction cost over-runs would be borne by GenOn (Exh. GENON-AMC-1). As a dual-fuel unit, the GenOn Alternative would be able to avoid a need for more expensive firm gas supplies, and could switch to ULSD if gas supplies were not available.

E. Positions of the Parties

1. NSTAR

NSTAR argues that project alternatives must add sufficient transmission capacity to eliminate overloads; that generation alternatives would have to either be economic to run in merit or capable of providing full output within ten minutes of starting and would need to be available by 2013 (Company Brief at 33) – a combination of criteria that none of the non-transmission alternatives would meet. The Company argues that it is not reasonable or feasible to rely on demand response to meet the identified need; that load shedding and/or paying existing Canal units for LSCPR is “unacceptable”; and that the identified generation alternatives in the record are inferior to the Project due to cost, reliability, and timing reasons (*id.* at 50, 35, 39-47).

NSTAR asserts that its proposed Project is the superior alternative for meeting an important reliability need in the Tremont East portion of the Company’s service territory and that the Project was vetted through an open and transparent stakeholder process, and ultimately approved by ISO-NE for inclusion in the Regional System Plan. NSTAR contends that it is “critically important that the Board get these issues right in this proceeding, not only for customers in Lower SEMA, but also for a host of other needed transmission projects that will soon be coming before the Siting Board using the same planning process and the same objective of providing customers safe, reliable and economic service” (Jan 12, 2012 EFSB Meeting Tr. at 20).

NSTAR argues that deterministic modeling has been firmly established for over 50 years, and that probabilistic evaluation of alternatives is too uncertain for the Board to rely on. NSTAR argues that, to the extent NSTAR and ISO-NE do not comply with national criteria, both could be subject to fines or other sanctions (Company Reply Brief at 11). In sum, NSTAR cautions that the use of probabilistic analysis to evaluate the Project, or alternatives, is not proper or

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consistent with relevant standards, procedures, and precedent and should be rejected by the Board.

With respect to load shedding, NSTAR asserts that reliability standards do not allow for substantial load shedding, except as a short-term practice to meet the reliability requirements (Company Brief at 37). Moreover, the Company asserts, the Siting Board's overriding statutory mandate "to provide a reliable energy supply" for the Commonwealth is not properly achieved when load shedding is used in a manner that can result in large increments of loss of load on a long-term basis (*id.*). NSTAR suggests that up to 25 MW of load shedding is a potentially acceptable planning level, but that the levels under consideration for Tremont East are beyond amounts discussed or implemented by transmission planners (*id.* at A-9).

In looking at on-Cape quick-start gas turbines as a reliability solution, the Company argues that both its own conceptual quick-start unit and GenOn's proposed two-unit gas turbine facility for the Canal site are inadequate (*id.* at 41). In both cases, the Company concluded that the capital costs were too high relative to the Project, the energy market revenues too low to offset the higher capital costs, and the construction lead times too long to offer a timely, cost-effective, reliability alternative to the Project. Further, the Company notes that the contractual costs to support construction and ongoing operation of the quick-start units would be borne entirely by NSTAR's ratepayers (and/or other electric distribution companies) whereas costs of the Project would be apportioned across New England. The Company asserts that the price suppression benefits identified by GenOn's witness Dr. Shavel were grossly overstated due to unrealistic assumptions about in-service dates for the GenOn gas turbines and various modeling and market representation anomalies in his analysis.

With respect to the role of the existing Canal units, NSTAR argues that the units are not suited to address the reliability need because they take close to a full day to reach full load from a cold start, and do not cycle on and off quickly. Further, relying on them for second contingency protection is too expensive given the uplift cost that would be incurred. Finally, NSTAR believes that continued compliance by Canal Station with new USEPA regulations for Section 316(b) cooling and air toxics could be difficult and that the units face an uncertain economic and regulatory future that could lead to unit retirement.

The Company defends its treatment of demand-side management, renewable energy and emergency generator resources, in its determination of the Local Sourcing Requirement ("LSR"),

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(which is the difference between the net peak load forecasts and the 460 MW import capability 115 kV system into Tremont East). The Company asserts that only 7.4 MW of RTDR has cleared the forward capacity market, and that an additional 161 MW would be needed in 2012, plus annual increments of five to ten MW to provide second contingency protection. While the Company calculates a theoretical net present value cost of \$266 million to obtain this quantity of RT DR over the ten-year period, it does not believe these quantities are attainable. With regard to renewables, the Company included all installed capacity and other projects that have cleared the FCM. Following ISO-NE practices, the Company notes that intermittent resources, such as offshore wind, are modeled at only ten percent of nameplate capability for capacity purposes.

The Company maintains that it has fully and reasonably accounted for all available energy efficiency measures in its 2009 and 2010 load forecasts, based on its recent energy-efficiency three-year plan, as approved by the Department, but did not make further assumptions about the results of future plans. The Company argued that Sandwich, in contrast, relies on undocumented expectation of virtually limitless levels of energy efficiency with any supporting documentation (NSTAR Issues Memo Comments at 21).

## 2. ISO-NE

ISO-NE supports the Company's view that the Project was found to be the preferred solution in the regional planning process and should be approved by the Siting Board (ISO-NE Brief at 1). ISO-NE notes that it is responsible for conducting long-term regional transmission planning for the New England region. As part of that process, ISO-NE plans and requires transmission system upgrades throughout New England to maintain system reliability, improve the efficiency of system operations, increase transfer capability, service major load pockets and reduce locational dependence on generating units. ISO-NE states that the regional planning process is open to a wide variety of stakeholders, all of whom have the opportunity to provide input through the Planning Advisory Committee ("PAC"). The resulting needs assessments performed by ISO-NE incorporates market responses that include not just transmission, but generation, distributed generation, demand response and energy efficiency. Where market responses are insufficient to eliminate identified needs, ISO conducts a "backstop" solutions study to develop regulated transmission solutions, which is the process that led to the Company's Project (id. at 19).

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ISO-NE takes strong exception to Mr. Chernick's testimony that the Siting Board should take into consideration a cost-benefit process whereby the probability of outages including their scope and duration is weighed against the cost of a reliability solution. ISO-NE contends that accepting loss of loads as a probabilistic policy choice, without fully understanding the potential durations, impacts and societal consequences of widespread loss of load is misguided and should be rejected by the Siting Board. ISO-NE finds Mr. Chernick's attitude toward outages to be "relatively cavalier" – essentially, a view that they merely constitute reduced comfort levels for customers, and that in more serious outage situations, customers with more critical needs should be prepared with their own backup power sources (id. at 23-24).

ISO-NE contends that the "planning process already does consider to some extent the possibility that selective outages might ameliorate a given need, depending on the duration of a given outage and the number of customers affected" (id. at 26). However, ISO-NE contends that, given the particular facts involved, load shedding for Lower SEMA is not an appropriate long-term solution for area reliability needs.

ISO-NE also argues against using the GenOn gas turbines, on the basis that it is not known whether the GenOn gas turbines will be built (id. at 29). GenOn has not secured a place in the ISO-NE interconnection queue for the turbines, has not secured permits, and has not bid into the forward capacity market (id. at 30).

### 3. GenOn

GenOn argues that NSTAR is planning for the past, is incorrect in asserting that no reliance may be placed on load interruption, and is assuming that Massachusetts will fail to achieve its goals with respect to energy efficiency and contributions on peak from community wind, photovoltaic, combined heat-and-power, and off-shore wind resources (GenOn Brief at 1, 16). GenOn argues that NSTAR is treating energy efficiency as a withering resource, when future opportunities for additional savings can be anticipated, and argues further that limiting consideration of renewable projects to those that have cleared the Forward Capacity Market is unnecessarily restrictive (id. at 16-18). With respect to an alternative of operating the existing Canal units to protect against an N-1-1 loss of load, GenOn notes that the ISO-NE cost estimate for this alternative came in after the close of hearings and so was not subject to cross-examination, that it was based on a New England load cut-off rather than on Tremont East load, and that it is without foundation (id. at A-8). GenOn argues that ISO-NE's estimate of

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\$20 million for 2010 is too high, in part because operation of Canal units for local protection could be limited to days on which loads would otherwise require posturing to drop the entire Cape and Islands load (*id.*). This more limited use would cost less than operating Canal units on all days that loads exceed the firm capacity of the 115 kV lines (*id.*). GenOn argues that NSTAR's characterization of regulatory risks to the continuing operation of Canal overlooks key elements of the regulations that would give greater flexibility or outright exemptions for facilities such as Canal that have very low capacity factors or the particular types of environmental control equipment already in place at the facility.

GenOn notes that with the short-term measures and ISO-NE posturing load for post-first contingency protection, NSTAR has completely eliminated its uplift payments to Canal for LSCPR payments, which were zero in the last few months of 2009 and all of 2010 (GenOn Brief at 11). GenOn contends that the immediate goals of ending dependence on Canal Station for second contingency protection has already been achieved and argues that in the 39 years since the second 345 kV line was added, the loss of both 345 kV lines has only occurred one time, and the resulting loss of load was, in fact, caused by a transmission system operator error (*id.* at 11). With the short-term measures in place, and the current posturing procedures to selectively shed load, GenOn states that, "[i]n essence, ratepayers are providing post-first contingency protection service (*i.e.*, local second contingency protection) to themselves free of charge" (*id.* at 13).

GenOn argues that NSTAR should properly have evaluated the GenOn gas turbine alternative in its Petition, since GenOn had previously approached NSTAR with ideas for addressing NSTAR's reliability concerns (*id.* at 22). GenOn argues that price suppression legitimately should be counted as a benefit (except where a generation unit is being proposed for the sole purpose of depressing market prices), and that consideration of price suppression makes its generation alternative superior to the proposed Project in terms of cost to Massachusetts ratepayers (*id.* at 28, A-6). GenOn argues that ratepayers would be exposed to cost overruns if the transmission alternative is selected, whereas GenOn would be willing to cap its capital cost contingency, absorbing this risk itself (*id.* at A-15). GenOn also argues that the new gas turbines it proposes would have minimal incremental environmental impacts (*id.* at 34). GenOn argues that, unlike the flexibility benefits new peaking generation in the region would bring, the proposed Project is only good for providing what the other two 345 kV lines already provide,

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and that a broader analysis would show that GenOn's alternative provides better reliability benefits (id. at 37, A-12).

GenOn's proposal in this proceeding, discussed infra, is that new quick start gas turbines at the Canal site would best meet the need for new energy resources in Tremont East (if need is shown to exist). However, GenOn also sees the existing Canal units as an interim solution until "NSTAR conducts a transparent and competitive alternatives review" that could lead to selection of appropriate new generating units to provide local reliability benefits.

#### 4. Sandwich

According to Sandwich, NSTAR would have the Siting Board believe that that load shedding is never an alternative to building a transmission line;<sup>30</sup> that the probability of events does not matter for transmission planning; that transmission planning is too complex for the Siting Board to consider the probability of outcomes; and that, since ISO-NE believes that its process considers all alternatives adequately, there is no need for Siting Board review of a project approved by ISO-NE (Exh. SAN-PLC-3, at 1, 2).

Sandwich urged the Board to not delegate all planning issues to ISO-NE (Tr. 11, at 1676). Sandwich's witness Mr. Chernick asserted that the improvement in reliability provided by the proposed project should be compared to its cost to determine whether its implementation is reasonable (Exh. SAN-PLC-3, at 9). Mr. Chernick noted that the case is unusually straightforward because Tremont East forms a nearly radial part of the transmission system, where analysis of the probabilities of events may be more fruitful than at locations with more complex interconnections (Tr. 11, at 1684, Sandwich Brief at 11; see also Tr. 1, at 67). Mr. Chernick argued that transmission projects may not be cost-effective when posturing for a low likelihood loss-of-load to avoid system problems, and that load-shedding is a reasonable response for rare events, as long as the load-shedding would contain the problem (Tr. 11, at 1628). Based on the low likelihood of an N-1-1 contingency, and the low likelihood of an outage in Tremont East from such a contingency, Mr. Chernick extrapolated that the project would be worth implementing if avoiding outages is worth \$1 million per outage per customer

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<sup>30</sup> Sandwich argues that NSTAR provided no on-point citations to published planning requirements to buttress the Company's claim that acceptance of a substantial loss of load following an N-1-1 contingency is not allowed.

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(*id.* at 1684). Mr. Chernick contrasted the low likelihood of an N-1-1 contingency to a historical frequency of 1.2 outages per year for NSTAR customers, considering all causes (Exh. SAN-PLC-3, at 10).

Sandwich argues that NSTAR's 2009 load forecast is inconsistent with the Commonwealth's energy policies, including the Green Communities Act, the Massachusetts Clean Energy and Climate Plan for 2020, and the Global Warming Solutions Act – and that NSTAR “continues to favor the building of more transmission” as it seems to be predicting failure to achieve “higher levels of energy efficiency savings” (Sandwich Brief at 18). Sandwich argues that implementation of energy efficiency programs will keep load growth flat over the next nine years, and is consistent with the Commonwealth's efficiency goals (*id.* at 19).

Sandwich argues that the GenOn gas turbines would bring a mix of benefits additional to local reliability: capacity revenues, energy sales, reserve market revenues, plus some price suppression (Tr. 11, at 1646). Mr. Chernick expressed a hope that ISO-NE, “which purports to consider non-transmission alternatives, would design the forward capacity market in such a way that a resource that's getting revenues as a non-transmission alternative to a transmission line would be able to count those revenues in demonstrating that a project is in the market” and could therefore be eligible for capacity revenues (*id.* at 1648). In this way, benefits that a project provides that are outside of markets can be “counted” as a comparative advantage in the market side of the electric power industry.

Sandwich argues that, to the extent the proposed project erodes revenue opportunities of the Canal units, the Town will eventually experience an erosion of tax revenue (Sandwich Brief at 3).<sup>31</sup> Mr. George Dunham, witness for and Town Administrator of Sandwich, stated that Sandwich received \$2.2 million of tax revenue for the Canal units for the year ending June 30,

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<sup>31</sup> Mr. Dunham related that he had been told by GenOn's public relations director that the proposed project would make the Canal units less active and contribute to a retirement decision (Tr. 11, at 1544). Mr. Dunham indicated that in negotiating tax valuation, GenOn links the value of the units to the amount of time the units run and the amount of electricity generated (Tr. 11, at 1529). Mr. Chernick predicted that the proposed Project would have a slight adverse economic impact on the Canal units (Tr. 11, at 1609). With respect to the GenOn turbine alternative, Mr. Dunham expressed a preference for new units because the tax assessment is more straight-forward and there would be less air emissions, compared to the existing Canal units (Tr. 11, at 1536-1537).

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2011 (Tr. 11, at 1545). For these reasons, Sandwich requests that the Siting Board reject NSTAR's petition (Sandwich Brief at 3).

#### 5. Attorney General

The Attorney General contends that load-shedding is not a long-term solution (AG Brief at 15). The Attorney General describes relying on the existing Canal units as costly (id.). With respect to the GenOn gas turbines, the Attorney General suggests that price suppression may be artificial and may only be short-term (id. at A-5). The Attorney General is concerned that benefits of price suppression "will be socialized across New England," while costs would be localized (id.). The Attorney General finds the Levitan/NSTAR estimate of price suppression more convincing than the Charles River/GenOn estimate, is concerned that the proposed GenOn gas turbines would fail to clear in the capacity markets, argues that ratepayers could end up paying more than with NSTAR's proposal, and argues further that the GenOn gas turbines may not be sufficient to meet planning reliability criteria (id. at 13-15). In addition, the Attorney General expressed concern that attention to probabilities could run afoul of planning requirements, potentially and unfairly leading to imposition of fines on ISO-NE and NSTAR (AG Brief Attachment at 1). Overall, the Attorney General requests that the Siting Board grant NSTAR's Petition (AG Brief at 2).

To "ensure that the Project is constructed in the most cost-effective manner, consistent with the public interest and to serve the public convenience," the Attorney General recommends that the Siting Board require quarterly and supplemental compliance filings by NSTAR to the Siting Board and all parties in the case (id.).

#### F. Analysis and Findings on Project Approaches

In meeting the need for energy resources found in Section III, above, the Company has presented for the Siting Board's review a proposed transmission facility and a variety of Project alternatives consistent with the mandates of G.L. c. 164, § 69J. The Board recognizes and appreciates the active involvement and creative, solution-oriented thinking of the Company and other parties in the proceeding regarding the development and presentation of Project alternatives and the many important issues related thereto.

NSTAR's presentation of Project alternatives included description and evaluation of four non-transmission alternatives and five transmission alternatives to the Project. Several of the

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transmission alternatives were inferior to the Project with respect to reliability, as assessed by the Company, and each was distinctly more expensive. None of the transmission alternatives appears to have significant environmental advantages relative to the Project. On this basis, the Siting Board agrees with the Company that the Project is preferable to all of the transmission alternatives. With respect to non-transmission alternatives, modifications to the Company's originally-presented alternatives were developed during the proceeding; these are evaluated below.

The Company described the use of Canal for second contingency protection as a "Do Nothing" alternative, but this term seems misapplied, as Canal Station has not been dispatched out-of-merit for second contingency protection since August 2009, following the completion of the short-term measures to the Lower SEMA transmission system. In fact, the record shows that the actual strategy in place in Tremont East at present is to address the threat of a second contingency with controlled load shedding through the use of posturing. Posturing in Tremont East is a practice that has been developed and coordinated by NSTAR, as the Transmission Operator, and ISO-NE, which has responsibility for maintaining the reliability of the New England bulk power system.

The record reveals that the combination of the short-term measures and posturing has been very effective in eliminating the significant financial burden of relying on Canal for second contingency protection and in maintaining a reliable transmission system for Tremont East. There is no dispute in the record about the effectiveness of the short-term measures, coupled with posturing in alleviating out-of-merit costs to Lower SEMA ratepayers without any degradation – thus far – to actual transmission system performance. The divergence of views about posturing revolves around whether it constitutes a viable strategy going forward, and if so, to what degree.

Inherently, when posturing is used as a planning strategy, it implies a willingness to accept some customer outages, when contingencies occur, in order to preclude significantly more severe scenarios of line overloads and voltage violations potentially leading to system equipment damage, voltage collapse, and/or cascading blackouts. As described by ISO-NE, posturing for a second contingency in Tremont East is feasible for shedding up to about one-third of peak load. The Company identifies 600 MW as the Tremont East load level above which all of Cape Cod and the Islands must be postured for interruption after the first contingency (NSTAR Reply Brief

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at 26).<sup>32</sup> Below a load of 600 MW, the system would be postured such that up to around one-third of Cape and Islands customers would be shed in the event of the second contingency. The record shows that the 600 MW peak load for Tremont East was exceeded by the 2010 peak of 664 MW. Thus, without the operation of Canal Station units, recent actual peak load levels were high enough that under a second contingency scenario, service to Cape Cod, Martha's Vineyard, and Nantucket would have been dropped. As noted by the parties, to the extent that peak loads grow and the 600 MW level is exceeded more frequently, exposure to blackouts in Tremont East would also increase.

The next question that arises is whether the present use of load shedding comports with the Siting Board's statutory requirements and precedent as well as established planning standards. The Company, ISO-NE and the Attorney General all assert that short-term operational provisions for load shedding should not form the basis of long-term plans. They further contend that load shedding exposure at the present level is not acceptable under reliability requirements established by NERC, NPCC and ISO-NE, and that ISO-NE's acceptance of the present load shedding procedures is predicated on the Company's efforts to build the Project. The draft Load Interruption Guideline would not accept load shedding of the entire Cape and Islands from an N-1-1 contingency. The Attorney General acknowledges the Siting Board's authority to balance factors, but cautions the Siting Board that denial of the Project would put the region's electric reliability at risk. NSTAR and the Attorney General also suggested that sanctions could be imposed if the Project is not built.

There has been considerable debate in the record about the probabilities associated with contingency events, and, more fundamentally, whether probabilistic assessments have any legitimate role to play in Siting Board review of project alternatives presented in G.L. c. 164,

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<sup>32</sup> The 600 MW figure approximates a number originally contained in the confidential (CEII) version of the Company's response to RR-EFSB-9. This number was redacted from the public version of the response, but the approximated figure, 600 MW, was used in the Company's Reply Brief at 26. The 600 MW figure is an important fact in the Board's alternatives analysis, but as the Siting Board historically has accorded significant deference to parties' assertions of CEII status for evidence submitted in Board proceedings, the figure was withheld from the public record of the case until the fourteenth day of evidentiary hearings. The Siting Board urges the Company in the future to be more careful in its assertions of CEII status, so that relevant information is not needlessly kept from public scrutiny.

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§ 69J petitions. Given ISO-NE's use of deterministic methods in reliability planning, NSTAR, ISO-NE and the Attorney General have cautioned the Siting Board about adopting a probabilistic approach as incompatible with ISO-NE's, and quite complex to develop and use. However, the Siting Board sees value in probabilistic assessments as a complement to deterministic approaches. Indeed, ISO-NE is currently in the process of reviewing stakeholder comments on ISO-NE's draft load shedding guidelines, which acknowledge the probabilistic nature of transmission outages and their duration.

The Board views the draft Load Interruption Guideline as helpful in providing some consistency in how transmission operators determine the manner that load shedding is used, and under what circumstances. The Board would note that underlying the Load Interruption Guideline is an implicit premise that reliability planning does not, and should not, take place in the realm of absolutes, where 100 percent transmission grid reliability must be achieved regardless of the cost. The Guideline appears to acknowledge the need for balancing the tradeoffs between ratepayer costs and transmission reliability and the expectation that transmission-owning utilities will perform the balancing called for by the Guideline. For potential projects that provide only de minimis improvements in reliability (e.g., extremely low-probability contingency events) and involve high cost to ratepayers, the Siting Board will continue to question the appropriateness of such proposals submitted under G.L. c. 164, § 69J. The Board supports ISO-NE in its attempt to develop appropriate load-shedding guidelines that comport with our statutory mandate to balance reliability with cost and environmental impact considerations.

The Siting Board concurs with the Company, ISO-NE and the Attorney General that continuing to rely on a plan to shed load is not a superior solution to the identified need, because the entire load of Cape Cod and the Islands should not be exposed to the risk of an outage from an N-1-1 contingency over multiple days each summer. Peak loads have already crossed well beyond the threshold at which posturing would place at risk a substantial portion of, if not the entire, Cape and Islands loads.

With regard to reducing net loads through demand-side measures and renewable and other supply side resources, Sandwich contends these resources could be combined with the loss of load alternative to reduce the potential amount of interrupted load to an acceptable level. However, there is no question that at least a sizeable fraction of the Cape and Islands load would

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be dropped on the second contingency, if this option were selected, because peak loads are so far above the firm capacity of the 115 kV lines. Prospects for sufficient, future net load reductions are too uncertain to rely on such reductions as a means to reduce the loss of load to an amount that would be acceptable to the Board. The Board finds that, even in combination with an aggressive pursuit of demand-side and supply side resources, posturing for load loss is not the preferred alternative for meeting the identified need in this case.

With regard to the availability, performance and cost of the existing Canal units to meet capacity requirements in Tremont East, there is no dispute that the units have high air emissions relative to new generation, are slow to ramp up and down, and would impose substantial out-of-merit dispatch costs if operated for local reliability service for the foreseeable future. Had the Canal units been operated for second-contingency reliability protection in 2010, ISO-NE estimated ratepayers would have been charged about \$20 million for uplift payments to Canal. The proposed Project's estimated revenue requirement for the first year is about \$16.6 million, somewhat less than the ISO's hypothetical 2010 uplift charges for 2010.<sup>33</sup> It is likely that operating the Canal units as a precautionary measure to avoid load interruption under N-1-1 conditions will be far more expensive than NSTAR's proposed Project in the future as the Project's revenue requirement diminishes over time, and the price disparity between oil and gas continues. Expenditures required by USEPA could further increase costs of relying on the Canal units. With no clear cost, impact, or reliability advantage relative to the Company's proposed Project, the Siting Board finds that using the existing Canal units for local reliability purposes is not the preferred alternative for meeting the identified need.

GenOn has proposed adding quick-start turbines at its site on the edge of the Cape Cod Canal, or elsewhere on Cape Cod. While the canal location proposed by GenOn is attractive from a land use perspective since it is already developed as an industrial site, addition of turbines would still be a visible change, and the turbines would add some local noise and local air emissions. New gas turbines at this location would provide a number of different benefits for energy consumers, including local reliability benefits, energy capacity, and energy supply. At present, energy and capacity revenues of a generation project are low, leaving ratepayers to bear

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<sup>33</sup> Furthermore, the \$16.6 million cost of the Project is expected to be spread across ratepayers throughout New England, while the uplift charges would likely be spread only among SEMA ratepayers.

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fixed contractual costs that would be required by GenOn to proceed commercially. While the net benefits asserted by GenOn are theoretically possible depending on an array of optimistic assumptions, we are not persuaded that a peaking unit with a very low capacity factor (of two to five percent) would run a sufficient number of hours to provide the enormous price suppression effects GenOn has asserted are compensatory for Lower SEMA ratepayers who would shoulder many of the fixed costs of developing this project (see Exh. GENON-SK-1, at 8). We also share the concerns expressed by NSTAR that the development and permitting schedule put forth by GenOn is overly optimistic, and that it could easily be several years until the units would be online, able to provide the intended reliability benefit. Therefore, the Siting Board finds that construction of the GenOn gas turbines is not the preferred alternative for meeting the identified need.

The proposed Project offers sufficient transmission capacity to serve Tremont East load in the event that the other two 345 kV lines become unavailable in the N-1-1 contingency described in Section III. The proposed Project would require tree clearing and structure placement along the entire transmission right-of-way, among other impacts, but would have essentially no noise or air emissions during operation. The Project would cost \$98 million, excluding the double-circuit separation aspect of the project that is needed along with any alternative. Unlike the GenOn gas turbines, a fixed maximum capital cost would not be set for the proposed Project. The Board agrees with the Attorney General's related concern about monitoring Project costs. See Section V.G, below, for further discussion.

Accordingly, after reviewing the Project and each of the alternatives presented in this proceeding, the Siting Board finds that constructing the proposed Project is, on balance, superior to the alternative project approaches in terms of cost, environmental impact, reliability and the ability to address the identified need.

## V. ROUTE AND SITE ALTERNATIVES

### A. Route Selection

#### 1. Standard of Review

G. L. c. 164, § 69J requires a petition to construct to include a description of alternatives to the facility including "other site locations." Thus, the Siting Board requires an applicant to demonstrate that it has considered a reasonable range of practical siting alternatives and that its proposed facilities are sited in locations that minimize cost and environmental impacts. To do

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so, an applicant must meet a two-pronged test. First, the applicant must establish that it developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner which ensures that it has not overlooked or eliminated any routes which, on balance, are clearly superior to the proposed route. Second, the applicant must establish that it identified at least two noticed sites or routes with some measure of geographic diversity.

New England Power Company, EFSB 09-1/D.P.U. 09-52/09-53, at 19-20 (2011) (“National Grid Worcester”); Western Massachusetts Electric Company, EFSB 08-2/D.P.U. 08-105/08-106, at 42 (2010) (“GSRP”); Massachusetts Municipal Wholesale Electric Company, 12 DOMSB 18, at 92 (2001).

## 2. The Company’s Route Selection Process

The proposed Project includes constructing a new 345 kV transmission line and tying it into an existing line capable of carrying 345 kV – specifically, to the section of Line 120 extending from a point adjacent to Bourne Switching Station to West Barnstable (Exh. NSTAR-1, at 1-12). The new part of the line could start either at Carver Substation in Carver or at Pilgrim Station Switchyard in Plymouth (*id.* at 4-3 to 4-4). NSTAR identified and screened eight distinct routes for new transmission from the starting point to a point on Bournedale Road in Bourne (*id.* at 4-4, 4-5). Only one route was identified for the 1.4-mile portion of the route from Bournedale Road, across the Cape Cod Canal to Bourne Switching Station (*id.* at 4-30). According to the Company, no other feasible route exists for this portion (*id.*). For the remainder of the routes, NSTAR looked to link existing corridors, such as highways and existing utility rights-of-way, between the endpoints (*id.* at 4-5). The eight routes from Carver Substation or Pilgrim Station Switchyard to Bournedale Road included five overhead routes, one underground route and two route variations (*id.*). Screening for cost, environmental impacts, and reliability reduced the eight potential routes to three routes, all limited to overhead construction (*id.* at 4-10 to 4-12).

For the next step in its route selection process, NSTAR compared the three remaining routes, designated herein as the Primary Route, the Alternative Route, and the Eastern Route, with respect to cost, environmental impacts and reliability.

The costs of the routes were estimated based on the existing conditions of the routes, preliminary design of the new 345 kV line on each route, existing facilities, construction conditions, the need to relocate or reconstruct existing facilities, extent of wetland and need for

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clearing along the ROW (id. at 4-21). NSTAR's preliminary cost estimates were \$32.8 million for the Primary Route, \$43.7 million for the Alternative Route, and \$49.5 million for the Eastern Route (id.).

NSTAR's environmental analysis of the routes was based on 16 criteria identified by the Company: wetlands, wetland conversion, vernal pools, rare species, stream crossings, groundwater resources, tree clearing, number of residences where tree clearing removes buffer to the ROW, visual impacts, historic resources, archaeological sensitivity, residences, sensitive receptors, conservation and recreation lands, access points, and length of line built or rebuilt (Exh. NSTAR-1, at 4-23, 4-24). The Company assigned weights to each criterion reflecting the judgment of the Company as to the relative importance of the criteria, and also prepared an alternative weighting scheme that was more sensitive to visual impact and conservation and recreation lands (id. at 4-25). The Company then compiled a raw score, a weighted score and an alternative weighted score (id. at 4-25, 4-26). Under each of the three scoring schemes, the Primary Route received the lowest score, indicating that, according to the Company's analysis, it was superior to the other routes with respect to environmental impacts (id. at 4-27). The Eastern Route would impact fewer wetlands within work zones, fewer stream crossings and fewer groundwater resources than both the Primary and Alternative Route, but would have the greatest impacts of the three routes in all of the other areas, including more than double the amount of tree clearing than the Primary Route, and 30 percent more rare species habitat within work zones (id. at 4-25). For these reasons, the Company proceeded to evaluate and compare only the Primary and Alternative routes (id. at 4-26).

In past decisions, the Siting Board has found various types of criteria to be appropriate for identifying and evaluating route options for transmission lines and related facilities. These types of criteria include natural resource issues, land use issues, community impact issues, cost and reliability. GSRP, EFSB 08-1/D.P.U. 08-105/08-106, at 46-47; New England Power Company, 4 DOMSB 109, at 167 (1995). The Siting Board also has found the specific design of scoring and weighting methods for chosen criteria to be an important part of an appropriate site selection process, and in some cases, the Board has identified the appropriate site selection process and in some cases it has identified the appropriate allocation of weights among the broad categories of environmental concerns, cost and reliability. GSRP, EFSB 08-21/D.P.U. 08-105/08-106, at 47; Boston Edison Company, 19 DOMSC 1, at 38-42 (1989). Here, the Company

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developed numerous screening criteria, which it used to evaluate the routing options. These criteria generally encompass the types of criteria that the Siting Board previously has found to be acceptable. The Company also developed a quantitative system for ranking routes based on compilation of weighted scores across all criteria. This is a type of evaluation approach the Siting Board previously has found acceptable. Further, the Company identified and compared a large number of potential routes, eight in total. After choosing three viable candidate routes, the Company applied its scoring criteria three times, giving different weights to different impacts in each iteration.

The Siting Board finds that the Company has developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner which ensures that it has not overlooked or eliminated any routes which are clearly superior to the proposed Project.

### 3. Geographic Diversity

The three routes selected by the Company share a single endpoint, while the Primary and Alternative Routes originate at a common location and the Eastern Route originates at a distinct location. The 16.6-mile Primary Route travels east from the Carver Substation through Carver and Plymouth, then southeast to Bournedale Road in Bourne (Exh. NSTAR-1, at 4-14, 4-15). The 18-mile Alternative Route travels south from Carver Substation through Carver and into Middleborough, then travels east through Rochester, Wareham, Plymouth and to Bournedale Road in Bourne (*id.* at 4-16, 4-17). The 16.6-mile Eastern Route originates at the Pilgrim Station Switchyard, travels south through Plymouth and then to Bournedale Road in Bourne (*id.* at 4-18). The Primary and Alternative Routes both start at Carver Substation and meet at Bournedale Road but are otherwise distinct and largely a few miles apart. The Eastern Route starts several miles to the east of the Primary and Alternative Routes, but shares 9.3 miles heading south to Bournedale Road with the Primary Route. The Siting Board finds that the Company has identified a range of practical transmission line routes with some measure of geographic diversity.

### 4. Conclusions on Route Selection

The Company has: (a) developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner which ensures that it has not overlooked or eliminated any routes which are clearly superior to the proposed project, and (b) identified a

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range of practical transmission line routes with some measure of geographic diversity. Therefore, the Siting Board finds that the Company has demonstrated that it examined a reasonable range of practical siting alternatives.

B. Environmental Impacts of Transmission Line

1. Standard of Review

In implementing its statutory mandate under G.L. c. 164, § 69H, the Siting Board requires a petitioner to show that its proposed facility is sited at a location that minimizes costs and environmental impacts while ensuring a reliable energy supply. To determine whether such a showing is made, the Siting Board requires a petitioner to demonstrate that the proposed route for the facility is superior to the alternative route on the basis of balancing cost, environmental impact, and reliability of supply. GSRP, EFSB 08-2/D.P.U. 08-105/08-106, at 48; National Grid Worcester, EFSB 09-1/D.P.U. 09-52/09-53, at 30; Russell Biomass LLC, EFSB 07-4/D.P.U. 07-35/07-36, at 50 (2009).

Accordingly, in the sections below, the Siting Board examines the environmental impacts, reliability and cost of the proposed facilities along the Primary and Alternative Routes to determine: (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. In this examination, the Siting Board compares the Primary Route and the Alternative Route to determine which is superior with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

2. Introduction

As noted above, the 18-mile Primary Route and 19.4-mile Alternative Route follow entirely distinct ROWs from the Carver Substation to their intersection in Bourne west of the Cape Cod Canal (Exh. NSTAR-1, at 4-15 to 4-17). Both routes include a 1.4-mile segment which starts at the intersection point of the Primary and Alternative Routes, crosses the Cape Cod Canal and ends at Bourne Switching Station, and any impacts associated with that portion of the Project would occur regardless of which route is chosen. The impacts associated with the Primary Route, the Alternative Route and the common section crossing the Cape Cod Canal are discussed in detail below.

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The new 345 kV line along the Primary Route includes approximately 4.4 miles in Carver, 11.8 miles in Plymouth and 0.4 miles in Bourne (Exh. NSTAR-1, vol. II, at fig. 1). The 345 kV line along the Alternative Route includes approximately 3.5 miles in Carver, 3.7 miles in Middleborough, 0.6 miles in Rochester, 7.6 miles in Wareham, 2.2 miles in Plymouth and 0.4 miles in Bourne (*id.* at fig. 5). Both routes include the additional 1.4-mile shared section in Bourne, which includes the canal crossing. The two routes are shown in Figure 2, attached.

Impacts associated with alterations at Carver Substation, and the proposed terminal substation in West Barnstable are discussed separately in Section V.F, below.

### 3. Wetlands and Water Resources

The construction and development of the proposed Project will result in both temporary and permanent impacts to wetlands associated with the following activities: the use of swamp mats for movement of heavy machinery and grading and filling of access roads, ROW clearing, and structure installation (Exh. NSTAR-1, at 5-20). The proposed Project may also impact surface water and drinking water supplies (*id.* at 5-35 to 5-37).

#### a. Primary Route

Most of the Primary Route is not in or near wetlands (Exh. NSTAR-1, at 5-27). The Primary Route includes approximately 39 acres of delineated vegetated wetlands including forested wetlands, shrub swamps, emergent wetlands, and commercial cranberry bogs (*id.*). The majority of these wetlands are located in Carver; the remainder, in Plymouth, are mostly associated with open water bodies (*id.*). Tree clearing within the ROW would convert approximately 4.7 acres of forested wetland into scrub-shrub wetland (*id.*). Placement of swamp mats would result in approximately 1.2 acres of temporary wetlands impacts, and structure installation would result in the elimination of approximately 196 square feet of wetland (Exh. EFSB-G-3(S2), at 5-2).

The Primary Route crosses 13 streams and water bodies and the ROW contains 5.1 acres of open water (Exh. NSTAR-1, at 5-35). There are approximately 188 acres of protected water supply areas within 300 feet of the Primary Route (*id.* at 5-38). These include Massachusetts Department of Environmental Protection (“MassDEP”) approved Zone II wells, and surface water supply watershed, and a local Water Resource Protection District.

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The Company stated that mitigation for both temporary and permanent wetland impacts will be implemented in accordance with the rules and regulations of, and in consultation with the Army Corps of Engineers, MassDEP and local conservation commissions (Exh. NSTAR-1, at 5-30). Surface vegetation and contours of the temporarily affected wetlands would be substantially restored (id.). Permanent impacts would be replaced in-kind proximate to the water body or waterway of the lost area, in an amount at least equal to that of the permanently filled area (id.). The total amount of wetland replication will be determined after the completion of the Project and the Company anticipates that all replicated wetlands will be within the ROW (id.). The Company will be submitting Notices of Intent to the conservation commissions in Carver, Plymouth, Bourne and, Barnstable (Exhs. EFSB-W-1; EFSB-G-3(a)(6)).

With respect to groundwater and drinking water resources, the Company will use proper spill containment gear and materials in order to contain any inadvertent spills or leaks that take place while re-fueling or lubricating equipment on the ROW (Exh. NSTAR-1, at 5-39). In addition, the Company would not re-fuel or lubricate any machinery within 100 feet of marked wetlands, bogs, streams or ponds (id.; EFSB-W-4).

b. Alternative Route

The Alternative Route includes approximately 58 acres of delineated vegetated wetlands very similar in nature to those on the Primary Route (Exh. NSTAR-1, at 5-28). Tree clearing within the ROW would convert approximately 7.9 acres of forested wetland into scrub-shrub wetland (id. at 5-24). Placement of swamp mats would result in temporary impacts, while structure installation would result in permanent impacts (id. at 5-30).

The Alternative Route crosses 19 streams and water bodies and the ROW contains 5.2 acres of open water (id. at 5-35, 5-36). There are approximately 271 acres of protected water supply areas within 300 feet of the Alternative Route, including interim wellhead protection areas, MassDEP approved zone II, and wells (id. at 5-35).

The wetland mitigation and groundwater and drinking water precautions described above for the Primary Route would also be implemented for the Alternative Route (id. at 5-30, 5-39).

c. Common Impacts

The 1.4-mile common portion of the routes from the intersection point west of the Cape Cod Canal to the Bourne Switching Station east of the canal contains a small, isolated wetland

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just south of Bournedale Road (Exh. NSTAR-1, at 5-29). This portion of the route crosses the Cape Cod Canal, which is a man-made ocean level canal, with no associated vegetated wetlands (id.). No wetland impacts are anticipated with respect to this portion of the proposed Project (id.). The common portion traverses approximately 987 linear feet of a zone II area and there is a public water supply within approximately 160 feet of the edge of the ROW (id. at 5-39).

The new 345 kV line will span the Cape Cod Canal, with vertical clearance approximately equal to the clearance of the existing transmission lines (id. at 5-37). The Company stated that it will comply with Army Corps of Engineers minimum clearance requirements (id.). The Company anticipates that Army Corps permitting will maintain the current existing clearance, which is approximately 165 feet above mean high tide (id.). The conductors will be strung across the Cape Cod Canal using helicopters, and no in-water work will be required (id.). Permits to cross above the canal are nevertheless required and the Company will seek necessary permits from the Army Corps of Engineers under Section 10 of the Rivers and Harbors Act of 1899 (id.).

The Company stated that in recent years residents of the Cape Cod region have raised concerns over the use of herbicides and the potential for contaminating drinking water sources (Tr. 6, at 894). NSTAR stated that it follows state regulations with respect to what herbicides may be used in areas of protected water supplies and also in and near other sensitive areas such as wetlands (id. at 894-895). In addition, the Company stated that it has worked and will continue to work with municipalities, as well as the Cape Cod Commission, to address concerns regarding herbicide use (id.).

d. Conclusion on Wetland and Water Resource Impacts

Based on the above, the Primary Route impacts approximately 30 percent less wetland acreage than the Alternative Route. The Primary Route also includes fewer surface water bodies and has less acreage of protected drinking water supply resources in and around the ROW than the Alternative Route. The Siting Board finds that the Primary Route would be preferable to the Alternative Route with respect to wetlands and water resources.

For the segment of the Project from Bournedale Road to Bourne, including the canal crossing, no wetland impacts are anticipated. No in-water work will be required for the crossing of the Cape Cod Canal; however, the Company will seek permits from the Army Corps of Engineers for this portion of the Project.

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The Company has indicated that it will be replicating wetlands, although the total amount of wetland replication has yet to be determined. Therefore, the Siting Board directs the Company to replace permanently altered wetlands in kind, proximate to the relevant waterbody, in an amount at least equal to the amount of the permanently altered wetlands.

The Company recognizes that local residents are concerned about the use of herbicides and their potential for contaminating water resources. The Company stated that it applies herbicides in accordance with applicable regulations and will work with municipalities and other entities to address concerns regarding herbicides. The Siting Board directs the Company to ensure that under its continuing vegetative management program, any application of herbicides must be consistent with utility right-of-way Integrated Vegetation Management Practices and applicable rules and regulations of the Commonwealth. The Siting Board further directs the Company to continue to work with the affected municipalities and the Cape Cod Commission to address concerns regarding herbicide use. The Siting Board finds that with the mitigation proposed by the Company, and with the above conditions, impacts to wetlands and water resources from transmission line construction along the Primary Route would be minimized.

4. Land Resources and Historic Resources

a. Primary Route

The Company characterized the Primary Route as traversing a variety of uses; the principal use is public and private woodland, and other uses include commercial cranberry bogs and residential development (Exh. NSTAR-1, at 5-3). Approximately nine percent of the Primary Route contains cranberry bogs and other wetlands (*id.*). Vegetative communities include successional brushland, cranberry bogs, cropland, forest, and forested wetland (*id.* at 5-60).

There are several concentrated residential areas along the Primary Route located towards the beginning and end of the route. There is a densely-developed residential neighborhood to the north and west of Carver Substation with the closest residences along Peltola Lane in Carver (Exh. NSTAR-1, vol. II, at fig. 1). Another residential area begins approximately one mile along the ROW from Carver Substation. This area is less densely populated than the area surrounding Carver Substation, is approximately one mile long and includes several residences along and near Centre Street, South Meadow Road and Bisbee Drive in Carver (*id.*) This area also includes Carver High School, which is adjacent to the ROW; the closest playing field is 200 feet from the

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edge of ROW, and the nearest building is over 1000 feet from the edge of ROW (Exh. EFSB-G-8). Other than Carver High School, there are no schools or playgrounds near the Primary Route (id.). The other significant residential area is in Plymouth, south of the Myles Standish State Forest (“MSSF”), and begins at Bourne Road and continues east and south passing Lunn’s Way, Raymond Road and to Little Sandy Pond Road (Exh. NSTAR-1, vol. II, at fig. 1). This is a densely populated residential development with homes on both the east and west sides of the ROW (id.). There are approximately 180 residences within 300 feet of the ROW along the Primary Route (Exh. NSTAR-1, at 4-15).

The Primary Route traverses the MSSF, which is managed by the Massachusetts Department of Conservation and Recreation (id. at 5-4). The MSSF is wooded with a mix of deciduous trees and conifers (id.). Within the MSSF, the ROW crosses a pond and several roads (id. at 5-5). The Company stated that tree clearing would occur along the entire five mile portion of the ROW within the MSSF, for a width of approximately 50 feet (Tr. 5, at 771; Exh. EFSB-G-3(S2) at fig. 5-24). The total estimated amount of tree clearing along the Primary Route is 91 acres, of which 4.7 acres will be converted from forested wetland to scrub-shrub wetland (as discussed above) (Exh. NSTAR-1, at 5-24).

The Primary Route crosses nine areas of mapped rare species habitat, for a total of approximately 449 acres (id. at 5-31). There are 21 protected species, including plants and both vertebrate and invertebrate animals (id. at 5-32). The Company estimates that approximately 100 acres of mapped habitat would be disturbed during construction (id. at 5-33). The Company has and continues to consult with the Natural Heritage and Endangered Species Program (“NHESP”) regarding impacts to rare species habitat (id. at 5-34). As a result of consultation with the NHESP, the Company will develop and implement a Construction Period Monitoring and Protection Plan for eastern box turtles (Exh. EFSB-G-3(S2) at 5-15, 5-16). NHESP also required that the Company minimize impacts to species habitats by use of best management practices, including: fencing off or otherwise avoiding discrete locations where known plant and invertebrate species or habitats exist; confining construction vehicles to existing, maintained ROW access roads to the greatest extent practicable; and development of restoration plans for temporary staging and equipment lay down areas and limited habitat restoration or improvements within the ROW (id. at 7-10).

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There are no previously identified historical resources located within the Primary Route; however, there are 16 such resources located within one-half mile of the ROW (Exh. NSTAR-1, at 5-40). The Primary Route is located within the vicinity of 16 previously recorded archaeological sites (*id.* at 5-41). Approximately 33 percent of the ROW is classified as moderately sensitive and approximately six percent was identified as having a high sensitivity for containing archaeological resources (*id.*). Under the supervision of the Massachusetts Historical Commission (“MHC”), the Company has conducted studies within areas of moderate to high sensitivity for containing archaeological resources. If potentially significant resources are identified during construction, it is anticipated that the design of the line can be adjusted to avoid impacts to those resources (Exh. EFSB-G-3(S2) at 5-20).

Despite prohibitions by DCR, off-road vehicles have regularly used the ROW within the MSSF for recreation (*id.* at 5-21)). In order to discourage illegal use of the ROW by off-road vehicles, the Company stated that it will maintain existing and install some new barriers and gates at access points where possible, improve signage, create obstructive brush piles and monitor off-road vehicle use on the ROW within the MSSF (*id.* at 5-22, 5-23; Tr. 5 at 779-780).

b. Alternative Route

NSTAR characterized the Alternative Route as traversing a variety of land uses similar to those of the Primary Route, including public and private woodland, commercial cranberry bogs and residential areas (Exh. NSTAR-1, at 5-7). Approximately 28 percent of the Alternative Route crosses wetlands, considerably more than the Primary Route, and aerial photographs demonstrate that the Alternative Route traverses more unforested areas than the Primary Route (Exh. NSTAR-1, Vol. II, at fig. 6)

The Alternative Route passes a similar number of homes, compared to the Primary Route (Exh. NSTAR-1, at 4-18). By comparison, however, residences along the Alternative Route are spread out along most of the route instead of concentrated in a few neighborhoods (Exh. NSTAR-1, vol. II, at fig. 1). The Alternative Route shares Carver Substation as an originating point with the Primary Route, and from there south for approximately 1.2 miles, there is a relatively low density residential area (*id.* at fig. 5). Approximately eight miles further along the ROW there is another small neighborhood just north of Interstate 495 in Wareham, which includes Penikese Street, Acoaxet Lane and Charltonne Furnace Road (*id.*). North of the ROW and just west of the Rochester town line, there is another small neighborhood including Glen

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Charlie Road and Lake Shore Drive in Wareham (id.). Finally, there is a very sparsely populated residential area near Valley Substation in Plymouth along Bournehurst Drive and near Horse Pond Tap along Yearling Run Road in Bourne (id.). There are approximately 185 residences within 300 feet of the ROW along the Alternative Route (Exh. NSTAR-1, at 4-18).

Unlike the Primary Route, the Alternative Route does not traverse any part of the MSSF. Vegetative communities include successional brushland, cranberry bogs, forest, forested wetland, and pasture (id. at 5-60). Approximately 27 acres of tree clearing would occur on the Alternative Route, including approximately 7.9 acres of forested wetland (id. at 5-24). There are no schools or playgrounds near the Alternative Route (Exh. EFSB-G-8).

The Alternative Route contains approximately 185 acres of mapped rare species habitat for seven protected species, including plants and vertebrate and invertebrate animals (Exh. NSTAR-1, at 5-33). The Company estimated that approximately 90 acres of habitat mapped for these species would be disturbed during construction (id.).

The Alternative Route passes through one inventoried historic area, and is located within one-half mile of 22 historic resources (id. at 5-42). There are 38 previously-recorded archaeological sites located in the vicinity of the Alternative Route (id. at 5-43). Over 30 percent of the ROW was classified as having a high sensitivity for containing archaeological resources (id.).

c. Common Impacts

The 1.4-mile common portion of the ROW crossing the Cape Cod Canal traverses a sand pit, the Cape Cod Canal and a small section of the Massachusetts Military Reservation (Exh. NSTAR-1, at 5-62). Within the common portion of the ROW including the canal crossing, there are four protected species and approximately 60 acres of mapped rare species habitat (id. at 5-34). The Company noted that much of the mapped habitat within the common portion is within the canal itself and is located at a considerable distance from the spanning structures (id.).

There is one inventoried historic resource area within the common portion of the ROW, and 16 resources within one-half mile of the ROW (id. at 5-45). The 1.4-mile common portion has ten previously recorded archaeological sites within the ROW and the entire portion is classified as having a low sensitivity for containing archaeological resources (id.).

d. Conclusion on Land Resources and Historic Resources

The Alternative Route would result in significantly less tree clearing than the Primary Route, and contains less mapped priority habitat for rare species. However, the amount of habitat that would be disturbed during construction is similar for both routes. The Primary Route passes through MSSF for 5.1 miles, while the Alternative Route does not. The Primary Route and Alternative Route both pass through several residential communities of varying densities, and have very similar number of residences within 300 feet of the ROW. With respect to historic and archaeological resources, the Alternative Route is proximate to more inventoried historic resources, and there is a higher likelihood of encountering archaeological resources with the ROW along the Alternative Route. Overall, the Siting Board finds that the Alternative Route would be preferable to the Primary Route with respect to land resources and historic resources.

For the segment of the Project from Bournedale Road to Bourne, the land resources are minimal. Much of the mapped priority habitat is within the canal and will not be impacted by construction. To mitigate impacts to rare species on the Primary Route, the Company will develop and implement a plan to protect eastern box turtles during Project construction. There are few significant historical resources within the ROW and the sensitivity for archaeological resources within the ROW is low.

The Siting Board finds that with implementation of the monitoring and protection plan for the eastern box turtle, impacts to land resources and historic resources from transmission line construction along the Primary Route would be minimized.

5. Noise Impacts

Construction noise impacts can perhaps best be understood in terms of the different stages that will take place in sequence at a particular monopole installation location along the ROW. Since these tasks will be completed regardless of the route chosen, they are described here. Construction noise impacts specific to each route will be addressed below.

The construction events that will take place in sequence along the entire ROW are: clearing and preparation of level work areas at each pole location; excavation for and pouring of concrete foundations for monopoles; delivery of pole segments; erection of poles; installation of davits, insulator strings and hardware; placement of pull rope using a helicopter, followed by installation of conductors; placement of grounding wire; and pole site cleanup and revegetation (Exh. EFSB-NO-6). Land clearing work would take approximately one week per mile; pole

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foundation excavation and placement work will take two or three days per pole; pole erection will require one day per pole; helicopter placement will take several days for the entire route; conductor installation will take up to one week per mile; and site cleanup/revegetation will require about one day per pole (id.). Typical noise-generating equipment to be used along the ROW are: excavators, chainsaws, chippers, vibratory pile driver, cranes, concrete mixer trucks, vibratory concrete mixer, portable generators, and helicopters (Exhs. EFSB-NO-2; EFSB-NO-3).

Construction is planned to take place from 7 a.m. to 6 p.m. on weekdays (Exh. EFSB-NO-1). The Company stated that exceptions to these hours may be necessary for certain construction phases, such as installation of conductors over the Cape Cod Canal, transporting large pieces of equipment, and cutovers (id.). The Company does not anticipate construction taking place on Saturdays; however, it may be required to meet exigent schedule demands (id.). The Company stated that construction taking place outside the typical hours will be coordinated with the relevant municipality (id.). NSTAR asserted that there will be no measurable noise associated with the operation of the transmission line on either route (Exh. NSTAR-1, at 5-63).

a. Primary Route

For purposes of predicting construction noise impacts, the Company assumed that the nearest residence along the Primary Route is 50 feet from the closest point of the activity (Exh. EFSB-NO-3). The Company calculated maximum construction noise levels for tree clearing and transmission poles construction and wire installation assuming several pieces of noisy construction equipment operating simultaneously (id.). The noisiest phases would be during tree-clearing and helicopter wire-stringing, where the maximum noise levels at the closest residence would be 92 A-weighted decibels (“dBA”) and 96 dBA, respectively (id.). The Company characterized the ambient noise along the Primary Route as primarily quiet wooded open-space from Carver Substation through the MSSF, and a relatively quiet residential area south of the MSSF (Tr. 5, at 722-723).

There are approximately 29 homes within 50 feet of the edges of the ROW, 49 homes within 50 to 100 feet, and a total of 180 residences located within 300 feet on the Primary Route (RR-EFSB-22; RR-EFSB-27 3) Of the 29 homes within 50 feet of the edge of the ROW, 14 homes are located in the 1.2 mile segment at the beginning of the Primary Route from Russell Holmes to Bisbee Lane, and nine homes are located in the 2 to 2.5 mile segment in the Lunn’s Road vicinity (id.).

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b. Alternative Route

The Company used the same assumption for the Alternative Route, regarding the nearest residence, as for the Primary Route. Because the same equipment would be used regardless of which route is chosen, the maximum noise impacts would be the same, with tree-clearing and helicopter wire-stringing resulting in maximum noise levels of 92 dBA and 96 dBA at the nearest residence, respectively (Exh. EFSB-NO-3). The Company characterized ambient noise along the Alternative Route as varying between quiet rural/open-space, with highway traffic noise around the crossing of Interstate 495, and noisier mixed commercial and industrial areas to the east of the I-495 crossing (Tr. 5, at 723-724).

There are approximately 40 homes within 50 feet of the edges of the ROW, 16 homes within 50 to 100 feet, and a total of 185 residences located within 300 on the Alternative Route (Exh. RR-EFSB-22).

c. Common Impacts

The same construction techniques and sequence will be applied along the common portion crossing the canal, except for the actual stringing of wires across the canal, which will require helicopters (Exh. NSTAR-1, at 5-16). There are no residences along the 1.4-mile segment, so construction noise impacts would be negligible (*id.* at 5-63).

d. Conclusion on Noise Impacts

Based on the above, construction along both the Primary Route and the Alternative Route would result in significant impacts to residences near the ROW. The total number of residences which would be affected is nearly the same for both routes; however, there are more residences very close to the edges of the ROW along the Alternative Route. Ambient noise levels along the ROWs are likely to be fairly similar, but slightly quieter conditions are likely to prevail along the Primary Route than along the Alternative Route. Construction noise impacts on the segment of the Project from Bournedale Road to Bourne would be very minimal as there are no residential receptors in that area. The Siting Board finds that the Primary and Alternative Routes are comparable with respect to construction noise impacts.

Because of the noisy nature of transmission line construction, the Siting Board directs the Company to conduct all construction between the hours of 7 a.m. and 6 p.m. on weekdays only, and excluding holidays.. To the extent the Company finds that construction performed outside of

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these hours or on weekends or holidays is necessary, the Company shall seek written permission from the relevant municipal authority prior to the commencement of such work, and provide the Siting Board with a copy of such permission. If the Company and municipal officials are not able to agree on whether weekend, holiday, or extended weekday construction should occur, the Company may request prior authorization from the Siting Board, provided that it also notifies the relevant municipal authorities in writing of such request. Further, the Siting Board directs the Company, in consultation with the towns of Carver, Plymouth, Bourne, and Barnstable, to develop a community outreach plan for project construction. This outreach plan should, at a minimum, set forth procedures for providing prior notification to affected residents of: (a) the scheduled start, duration, and hours of construction; (b) any construction the Company intends to conduct that, due to unusual circumstances, must take place outside of the hours detailed above; and (c) complaint and response procedures including contact information and a dedicated project hotline for complaints.

The Siting Board finds that, with implementation of the conditions above, the noise impacts from transmission line construction along the Primary Route would be minimized.

6. Visual Impacts

a. Primary Route

Presently, the Primary Route ROW consists of two 345 kV above ground transmission lines. One 345 kV circuit is supported on wooden H-frame structures with an average height of 75 feet, while the other is supported on steel lattice structures with an average height of 110 feet (Exh. NSTAR-1, at 5-53, 5-54; Tr. 7, at 710). For a distance of 7.2 miles from the Carver Substation to the State Forest Transition Station, which is within the MSSF, the ROW is 300 feet wide, and currently cleared to a width of between 190 feet and 210 feet; south of that point the ROW is 330 feet wide and currently cleared to a width of between 210 feet to 230 feet (Exh. NSTAR-1, at 5-53).

The proposed new 345 kV circuit would be constructed on steel monopoles on the northern or eastern side of the ROW (id. at 5-54). From Carver Substation to the State Forest Transition Station, vertical monopoles would range from 87.2 feet to 139 feet, with an average height of 110 feet; and from the Transition Station south, delta-configured monopoles approximately 105 feet tall (maximum 110 feet) would be used (id.; Exh. EFSB-V-7). Between 35 feet and 65 feet of tree clearing along the northern or eastern edge would occur along the

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entire ROW (Exh. NSTAR-1, at 5-54). The Company estimated that as a result of tree clearing, approximately seven residences along the Primary Route would lose the entirety of the vegetative screening that currently exists between the homes and the ROW, and approximately 61 residences would experience a reduced vegetative buffer between the homes and the ROW (Exh. EFSB-V-2). In addition, there are several areas along the ROW, particularly in the 2- to 2.5-mile Lunn's Road residential area in Plymouth where residences already have a prominent view of the ROW and will continue to have a direct view following the addition of the proposed new circuit (Exhs. NSTAR-1, at 5-57; EFSB-V-3). The homes would experience an increased visual impact due to the addition of the new transmission line. The Company has stated that it would work with affected residences to mitigate the visual impacts of the Project (Exh. NSTAR-1, at 5-57). The Company has agreed to discuss possible vegetative screening and pole placement plans with affected abutters before construction begins (Exh. EFSB-V-10). The Company stated that visual mitigation could include new vegetative screening, which would be located off the ROW on private property (Exh. EFSB-V-2).

b. Alternative Route

Presently, the Alternative Route ROW has several different configurations consisting of two or more 115 kV transmission lines and one or more distribution lines depending on the segment (Exh. NSTAR-1, at 5-54). For the first 8.5 miles south from Carver Substation, the ROW has two 115 kV circuits supported on a single line of double-circuit towers, and for four of those 8.5 miles there are two additional 115 kV circuits each supported on a set of wooden H-frame structures (*id.* at 5-55, 5-56). The double circuit towers are an average of 105 feet tall and the H-frame structures are in the 60-80 feet high range (*id.*; Tr. 5, at 709). This 8.5-mile segment varies in width from 100 feet to 205 feet and is currently cleared to a width of between 105 feet to 170 feet (Exh. NSTAR-1, at 5-55). From Tremont Substation eastward, there are two 115 kV circuits on H-frame structures about which there is conflicting testimony whether the existing structures are about 55 feet tall or are between 60 and 80 feet high; there is also one or two distribution circuits along portions of the route (*id.* at 5-55, 5-56; Tr. 5, at 709). This 9.8-mile segment varies in width from 175 feet to 205 feet and is currently cleared to a width of between 130 feet and 170 feet (Exh. NSTAR-1, at 5-55, 5-56).

The proposed new 345 kV circuit along the Alternative Route would be constructed using steel monopoles from the Carver Substation to the Wareham Substation with an average height

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of 105 feet, and from Wareham Substation east with an average height of 115 feet (Exh. NSTAR-1, at 5-55, 5-56). Between 25 feet and 55 feet of clearing would be required along the entire ROW (id.). The Company estimated that as a result of tree clearing six residences along the Alternative Route would lose the entirety of the vegetative screening between their residence and the ROW, and approximately 13 residences would experience a reduced vegetative buffer (Exh. EFSB-V-2). As with the Primary Route, there are areas along the ROW where residences already have a prominent view of the ROW, particularly just south of Carver Substation and along Acoaxet Lane in Wareham, that will continue to have a direct view following the addition of the proposed new circuit (Exh. EFSB-V-3). The homes would experience an increased visual impact due to the addition of the new transmission line.

c. Common Impacts

Presently, the portion of the ROW which crosses the Cape Cod Canal has two sets of double circuit lattice structures, one carrying two 345 kV circuits and one carrying two 115 kV circuits (Exh. NSTAR-1, at 5-57). Because the existing circuits span the canal, they are very prominent and visible from nearby points and the canal itself (id.).

The proposed new 345 kV circuit would be constructed on steel monopoles, the existing double circuit lattice structures carrying the existing 345 kV circuits would be removed, and the existing 345 kV circuits would be moved on to two new sets of steel monopoles (id.). The double circuit lattice structures currently carrying two 115 kV circuits would remain the same (id.).

d. Conclusions on Visual Impacts

Based on the above, it is difficult to differentiate between the two route alternatives. Construction on the Primary Route ROW would result in a larger number of residences experiencing a more prominent view of the ROW. Specifically, 61 homes along the Primary Route would experience a reduction in visual buffer versus 13 homes along the Alternative Route. However, the Primary Route ROW is relatively wide and already dominated by the existing large, 345 kV transmission lines, while the Alternative Route has smaller existing transmission lines and a narrower ROW. Therefore, construction of the new lines along the Alternative Route may result in the new transmission line appearing large and dominant by comparison. Based on these factors the Siting Board finds that the visual impacts of the Primary

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and Alternative Routes are comparable. Because construction of the proposed transmission line will have visual impacts on a large number of nearby residences, the Siting Board directs the Company to implement an off-site screening program for affected residences to include the following requirements:

(a) upon completion of construction the Company will notify in writing by first class mail with delivery confirmation all owners of property located on or abutting the ROW of the option to request that the Company provide off-site screening. The Company will follow up with a phone call to non-responding property owners for whom a phone number is accessible. The off-site screening may include, but it not limited to, shrubs, trees, window awnings and fences, provided that the Company's operating and maintenance requirements for its ROW facilities are met;

(b) provide property owners with a selection of generic renderings of possible mitigation approaches. Such renderings shall be for guidance purposes only, and shall not limit a property owner's ability to request different mitigation;

(c) meet with each property owner who requests mitigation to determine the type of mitigation package the Company will provide, provided that the Company has received a response from the property owner within three months of receipt of the Company's written notification;

(d) honor all property owners' requests for reasonable and feasible mitigation that are submitted within six months of a meeting with the Company and/or its consultants;

(e) provide a warranty to property owners to ensure that all plantings are established and replaced if needed at the end of one year from the date of planting, provided that the property owners reasonably maintain the plantings;

(f) submit to the Siting Board for its approval, at least three months before the conclusion of construction, a draft of the notification letter to property owners prior to mailing; and

(g) submit a compliance filing within 18 months of completion of construction detailing:  
(i) a list of all properties that were notified of the available off-site landscaping, (ii) the number of property owners that responded to the offer for off-site mitigation, (iii) a list of any property owners whose requests were not honored, and the rationale therefore, (iv) a general description of the types of off-site landscaping provided, and (v) the average cost of landscaping per property, broken down by installation, material, and design costs.

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The Siting Board finds that with implementation of the condition above, that visual impacts from transmission line construction and operation along the Primary Route would be minimized.

#### 7. EMF Impacts

The Company modeled pre-project and post-project electric and magnetic field levels for both the Primary Route and the Alternative Route, as well as the common segment including the canal crossing (Exh. EFSB-E-1). In addition, the Company estimated electric and magnetic field impacts for the portion of the Project which involves changing the voltage on an existing transmission line from 115 kV to 345 kV (id.).<sup>34</sup> The Company's modeling of magnetic field strengths was based on estimated peak and annual average loads for 2013 (id.). A summary of modeled magnetic field levels in milligauss ("mG") is provided and discussed below.

##### a. Primary Route

There are approximately 29 residences within 50 feet of the edges of the ROW along the Primary Route: (1) from Carver Substation to the State Forest Transition Station, there are approximately five residences north of the ROW and 14 residences south of the ROW within 50 feet; (2) from the Transition Station to Plymouth Crossover Station, there are approximately three residences north of the ROW and five residences south of the ROW within 50 feet; and (3) from Plymouth Crossover Station to Bournedale Road, there is one house on the north and one house on the south side of the ROW within 50 feet (Exh. EFSB-V-1(a)). The modeled pre-project and post-project magnetic field levels for the Primary Route are summarized in Table 2, below. Note that the edge-of-ROW magnetic field levels provided below are representative of levels at the edge of the ROW, whereas the residences accounted for above are located up to 50 feet from the edge of the ROW. Because magnetic field levels drop rapidly with distance from the source, the peak magnetic field levels at any given residence within the 50 feet would be equal to or less than the maximum levels listed in Table 2, below (Exh. NSTAR-1, at 5-65).

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<sup>34</sup> The uprating of this line involves no construction; therefore, discussion of this segment is omitted from the other portions of this decision discussing environmental impacts.

**Table 2. Peak Magnetic Field Levels – Primary Route**

| Segment                               | Pre Project (mG) |             |       | Post Project (mG) |                                       |          |
|---------------------------------------|------------------|-------------|-------|-------------------|---------------------------------------|----------|
|                                       | Maximum          | Edge of ROW |       | Maximum           | Edge of ROW (# of homes within 50 ft) |          |
|                                       |                  | North       | South |                   | North                                 | South    |
| Carver Substation to State Forest     | 70.1             | 8.6         | 5.2   | 77.4              | 22.8 (5)                              | 6.1 (14) |
| State Forest to Plymouth Crossover    | 88.9             | 5.6         | 8.4   | 72.9              | 19.0 (3)                              | 6.4 (5)  |
| Plymouth Crossover to Bournedale Road | 88.9             | 5.6         | 8.4   | 64.2              | 3.3 (1)                               | 22.0 (1) |

(Exh. EFSB-E-7)

The largest increase in magnetic field levels is 14.2 mG on the north edge of the ROW from Carver Substation to the State Forest Transition Station, where the existing level of 8.6 mG increased to 22.8 mG with the Project. The Company stated that it considered different structure types and concluded that monopoles would yield the lowest edge-of-ROW magnetic fields, and after further investigation chose to use a vertical monopole for the portion of the transmission line from Carver Substation to the State Forest Transition and a delta configuration for the remainder of the new transmission line (Exh. NSTAR-1, at 5-66). Finally, the Company compared the edge-of-ROW magnetic field levels for different phasing configurations and chose the configuration that would result in the lowest edge-of-ROW magnetic field levels (Exh. EFSB-E-9).

At Siting Board Staff's request, the Company evaluated an alternative ROW configuration in the vicinity of several neighborhoods along the Primary Route, moving the locations of both existing and proposed conductors away from the northern/eastern side of the ROW, where the new line is to be added, in an attempt to mitigate magnetic field impacts. The alternative configurations would result in reduced magnetic field levels for between two and three residences (depending on which alternative was chosen) but would result in *increased* magnetic field levels for between seven and eleven residences (depending on which alternative was chosen). Incremental construction cost for these alternative configurations ranged from

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\$2.2 million to \$9.8 million, and the Company stated that implementation would also involve line outage coverage costs of at least \$16 million (RR-EFSB-27).

b. Alternative Route

There are approximately 40 residences within 50 feet of the edges of the ROW along the Alternative Route: (1) from Carver Substation to Tremont Substation there are approximately five residences to the north of the ROW and six residences to the south of the ROW within 50 feet; (2) from Tremont Substation to Wareham Substation there are approximately seven residences to the North and seven residences to the south of the ROW within 50 feet; and (3) from Wareham Substation to Bournedale Road there are approximately thirteen residences to the north and two residences to the south of the ROW within 50 feet (Exh. EFSB-V-1b). The modeled pre-project and post-project magnetic field levels for the Alternative Route are summarized in Table 3, below. As with the Primary Route, note that the edge of ROW magnetic field levels provided below are representative of the levels at the edge of the ROW, whereas the residences accounted for above are anywhere between zero and 50 feet from the edge of the ROW. Because magnetic field levels drop rapidly with distance from the source, the peak magnetic field levels at any given residence within the 50 feet would be equal to or less than the maximum levels listed in Table 3, below (Exh. NSTAR-1, at 5-65).

**Table 3. Peak Magnetic Field Levels – Alternative Route**

| Segment                                  | Pre Project (mG) |             |       | Post Project (mG) |                                       |          |
|--|------------------|-------------|-------|-------------------|---------------------------------------|----------|
|  | Maximum          | Edge of ROW |       | Maximum           | Edge of ROW (# of homes within 50 ft) |          |
|  |                  | North       | South |                   | North                                 | South    |
| Carver Substation to Tremont Substation  | 68.2             | 34.1        | 5.2   | 66                | 33.0 (5)                              | 13.0 (6) |
| Tremont Substation to Wareham Substation | 59.6             | 10.9        | 3.7   | 44.8              | 6.1 (7)                               | 24.0 (7) |
| Wareham Substation to Bournedale Road    | 59.6             | 5.0         | 16.4  | 46                | 21.0 (13)                             | 8.5 (2)  |

(Exh. EFSB-E-7, errata)

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The largest increase in magnetic field levels is 20.7 mG on the southern edge of the ROW between Tremont Substation and Wareham Substation. Because the Alternative Route is relatively narrow and already contains other transmission lines, the Company chose to use a vertical monopole.

c. Common Impacts

The Company projected electric and magnetic field levels for the portion of the Project from Bournedale Road, crossing the Cape Cod Canal and continuing to the Bourne Switching Station (new construction) and from the Bourne Switching Station to the proposed new substation in West Barnstable (no new construction) (Exh. EFSB-E-7). For this entire portion of the Project the projected magnetic field levels with the proposed Project in place are lower than existing levels (id. at 17-18). The highest post-project edge-of-ROW magnetic field level along this portion of the Project is 11 mG; the existing level at this location is 17 mG (id.).

d. Conclusions on EMF Impacts

The Alternative Route has approximately 20 residences which could potentially experience magnetic field level increases over 10 mG, while the Primary Route has approximately nine residences which could potentially experience an increase of over 10 mG. While the Alternative Route also has the highest modeled single post-project edge-of-ROW magnetic field level, 33 mG, that is a decrease from existing levels; the highest along the Primary Route is 22.8 mG. The Primary Route has fewer residences within 50 feet of the edge-of-ROW, and fewer residences which could be exposed to higher and larger increases in magnetic fields than the Alternative Route. Therefore, the Siting Board finds that the Primary Route is preferable to the Alternative Route with respect to magnetic field levels.

The Company considered some additional measures in the hopes of reducing magnetic field impacts for residences near the ROW, but those measures actually increase magnetic field impacts, as well as increasing Project costs. With respect to the segment of the Project from Bournedale Road to Bourne, the magnetic field levels at the edge-of-ROW all decrease.

The Siting Board finds that the magnetic field impacts from transmission line construction and operation along the Primary Route would be minimized.

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8. Traffic

a. Primary Route

The Company asserts that project construction will have minimal impacts to traffic (Exh. NSTAR-1, at 5-19). The Company anticipates temporary roadway closures and would notify the relevant municipality prior to any road closings and would post traffic details to ensure the safety of the public (id.). The Company does not anticipate that delivery of materials or equipment would necessitate traffic control, but will consult with the relevant municipalities to ensure there are no traffic or safety concerns (Exh. EFSB-T-3).

The Company would prepare staging or supply yard areas for temporary storage or material and parking for heavy equipment, as well as sanitation facilities, dumpsters and material recycling facilities (Exh. NSTAR-1, at 5-13). The Company anticipates that it will be the responsibility of the construction contractor to locate and arrange for staging areas (Exh. EFSB-T-1). However, the Company stated that there will likely be several staging areas along the Project route, some within the ROW and some adjacent to the ROW, and none are expected to exceed one acre in area (id.). Staging areas are selected based on their proximity to the work site, and consideration is given to sites which avoid environmentally sensitive and residential areas wherever possible (Exhs. EFSB-T-1, EFSB-T-5).

Different stages of construction will require different sizes of work crews, ranging from crews of four workers each, to crews of twelve workers each (Exh. EFSB-T-2). Construction workers will park their personal vehicles at either the work location or an off-ROW staging area (id.).

b. Alternative Route

The anticipated traffic impacts associated with the Alternative Route would be similar to those anticipated for the Primary Route. In addition, the Alternative Route crosses Interstate 495 in two locations (Exh. EFSB-T-4). Prior to scheduling construction work crossing I-495, the Company would consult with the Massachusetts State Police regarding safety (id.).

c. Analysis

The potential traffic impacts of both the Primary and Alternative Routes would be minimal. The Company has stated that it would consult with the relevant municipality or agency when planning any road closings or interstate crossings. For both routes, the Company has not

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specified the number or location of staging or laydown areas, but estimates that they would be on NSTAR-owned land and occupy one acre or less. Based on the above, the traffic impacts of the Primary Route and the Alternative Route are comparable.

Because the Company will not know the details of the number and location of the staging and laydown areas until a contractor is selected, and because the Project passes through several residential areas, there is a possibility that some support sites may be located in such a way as to exacerbate traffic and noise impacts in those residential areas. Further, guidelines for construction worker parking have not been developed, for example, prohibitions on arriving too early or parking on residential streets. Therefore, the Siting Board directs the Company to submit for Siting Board approval a draft support site and substation/switching station plan, prior to the commencement of Project construction, to be developed with input from the communities where the support sites will be located. The plan should include both a written description and map of the specific location of each support site including the boundaries of each support site, and a description of all the activities that will occur at each site. The plan should describe: (a) the hours that activities will occur; (b) an estimate of the timeline for the use of each support site; (c) the duration and location of police details and/or flagmen if proposed; (d) maintenance of the support site to avoid impacts to the surrounding properties; (e) use restrictions; (f) additional mitigation as appropriate; (g) plans to return the site to its original use and condition; and (h) a description of how community input was obtained.

In addition, although traffic impacts associated with the project will be temporary in nature, the Company provided little information with respect to the specifics of traffic control. Therefore, the Siting Board directs the Company, in consultation with municipalities and Company contractors, to develop and implement a traffic management plan to minimize traffic disruption, which includes, but is not limited to, the following measures: (1) signs erected to identify construction work zones; (2) police details and/or flagmen to direct traffic near public road crossings; and (3) police details and/or flagmen to direct traffic at construction work sites along roads. Given the above conditions, the Siting Board finds that the traffic impacts from construction and operation of the transmission line along the Primary Route would be minimized.

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#### 9. Air Impacts

As a transmission facility, operation of the proposed Project along either the Primary Route or the Alternative Route generally would not contribute to air impacts. Emissions from construction vehicles are a concern, however. The Company has committed that all diesel-powered non-road construction equipment with engine horsepower (hp) ratings of 50 and above used for 30 or more days over the course of Project construction will have EPA-verified (or equivalent) emission control devices installed, such as oxidation catalysts or other similar technologies (Exh. NSTAR-1, at 5-18). Further, in prior cases, Companies have also committed to minimizing air quality impacts by using ultra-low sulfur diesel fuel and requiring that all construction vehicles (whether operated by the Company or by a construction contractor) limit vehicle idling to no more than five minutes in most cases. Here, the Company has not addressed these latter forms of mitigation.

Based on the above, air impacts from the Primary Route and the Alternative Route are comparable. The Siting Board directs the Company, as the Company has agreed, that all diesel-powered non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of Project construction must have USEPA-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies (to the extent that they are commercially available) installed on the exhaust system side of the diesel combustion engine. Prior to the commencement of construction, the Company shall submit to the Siting Board certification of compliance with this condition and a list of retrofitted equipment, including type of equipment, make/model, model year, engine horsepower, and the type of emission control technology installed.

Further, the Siting Board directs the Company that all off-road construction equipment used during Project construction shall use ultra-low diesel fuel, and that idling be limited to no more than five minutes whenever practicable. The Siting Board finds that, with the implementation of the above conditions, air impacts from construction and operation of the transmission line along the Primary Route would be minimized.

#### 10. Other Impacts

The substation upgrades performed during the Project construction would involve some potentially hazardous materials. One material that would be used at several substations is sulfur hexafluoride (“SF<sub>6</sub>,”) and is described in greater detail where substation impacts are discussed, in

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Section V.F.1.a, below. Another hazardous material is mineral oil dielectric fluid (“MODF”), which is used in transformers at substations (Exh. EFSB-S-1). Secondary containment is included where any MODF is stored or used, and any accidental release of MODF would trigger an alarm (*id.*). NSTAR maintains a 24/7 response program that would be called up in the event of a spill (*id.*). MODF would be used at substations regardless of which route was used. Based on the above, the Siting Board finds hazardous materials use impacts along the Primary and Alternative Routes are comparable. Given the inclusion of secondary containment and NSTAR’s 24/7 response program, the Siting Board finds that hazardous materials impacts along the Primary Route would be minimized.

Mr. Kerry LaLiberte, an intervenor in this proceeding and an abutter to the ROW in Carver, raised several issues with respect to the location of the proposed new transmission line (*see* LaLiberte comments on Issues Memorandum (Dec. 22, 2011); Jan. 12, 2012 EFSB Meeting Tr. at 90-94). As designed, the proposed 345 kV transmission line along the Primary Route would cross part of Mr. LaLiberte’s property (*see id.*). Mr. LaLiberte and the Company met and agreed to several measures designed to address Mr. LaLiberte’s concerns, largely involving changing some existing and proposed structure locations (*see id.*). The Siting Board directs the Company to construct the new transmission line in accordance with the following restrictions and requirements, as agreed to by the Company and Mr. LaLiberte: (1) the Company will relocate existing line 322, currently located on H-frame structures, onto new structures closer to the center of the ROW in the vicinity of Mr. LaLiberte’s home, so that the new transmission line will be no closer to the edge-of-ROW than existing Line 322 is today, adjacent to Mr. LaLiberte’s home; (2) to the greatest extent possible, the Company will not remove trees from the buffer which currently exists between Mr. LaLiberte’s home and the transmission lines; and (3) the Company will address Mr. LaLiberte’s concerns with respect to noise and vibration from existing Line 322.

### C. Cost

The Company estimated that the total Project cost, incorporating new transmission on the Primary Route, would be \$110 million (Exh. NSTAR-1, at 1-13). The costs that would be incurred regardless of which route is chosen include: construction work at Carver Substation (\$6 million), transmission line construction from Bournedale Road to Bourne, including the canal crossing and double-circuit tower separation (\$18 million), construction at Bourne

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Switching Station (\$4 million), new substation construction (\$22 million), and looping the existing line into and out of the new substation (\$2 million) (id. at 1-14). The Company estimates that transmission line construction from Carver Substation to Bournedale Road along the Primary Route would cost \$32.8 million, and along the Alternative Route would cost \$43.7 million (id. at 5-70). The Company states that the Alternative Route is more expensive largely because it contains a greater amount of wetlands than the Primary Route, which requires more mitigation and increases the length of construction (id. at 5-70). Accordingly, the Siting Board finds that the Primary Route is preferable to the Alternative Route with respect to cost.<sup>35</sup>

#### D. Reliability

The Company claims that there is no meaningful difference in reliability between the Primary Route and the Alternative Route (Exh. NSTAR-1, at 5-71). The Company's proposed Project would result in the three 345 kV lines serving Tremont East sharing about nine miles of ROW, from a point in MSSF in Plymouth to Bourne Switching Station on Cape Cod (Tr. 4, at 667-671). Sandwich identified three possible common-cause failures for two parallel transmission lines: a brush fire, a low or crashing airplane, and a tornado or other intense storm (Tr. 11, at 1592). Sandwich pointed out that such an event taking the two existing lines out of service would have a reasonably high chance of also taking out a new third line (id. at 1595). The Siting Board notes that the Alternative Route may have a reliability advantage insofar as it would not result in all three of the 345 kV lines supplying Cape Cod sharing a ROW for approximately nine miles, as would be the case for the Primary Route.<sup>36</sup> On this basis, the Siting Board finds that the Alternative Route would be preferable to the Primary Route with respect to reliability.

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<sup>35</sup> GenOn compiled cost increase data from recent transmission projects in New England (RR-EFSB-GEN-5(S)(1); EFSB Issues Memorandum at 13 (December 22, 2011)). The data showed cost increases of 14 to 172 percent over the original cost estimates for the identified projects, including a cost increase of 143 percent for the SEMA short-term measures (id.). As a result of its concerns regarding potential cost overruns, the Siting Board in Section V.G, below, directs the Company to provide the Board with a certified pre-construction Project cost estimate and with subsequent semi-annual reports of projected and actual construction costs. See Transcript of January 12, 2012 EFSB Meeting, at 39-42; 99-100; 106-108.

<sup>36</sup> ISO-NE indicated that it does not get involved in the selection of one route over the other, as the route and environmental evaluation and decision solely rests with the Transmission owner, regardless of reliability (Jan. 12, 2012 EFSB Meeting Tr. at 82-83).

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E. Conclusions on Route Comparison

The Siting Board found, above: (1) that the Primary Route is preferable to the Alternative Route with respect to wetlands and water resource impacts, and magnetic field impacts; (2) that the Alternative Route is preferable to the Primary Route with respect to land use resources and cultural and historical resources; and (3) that the Primary Route and the Alternative Route are comparable with respect to traffic, noise, visual, air, and hazardous materials impacts. The Siting Board notes, however, that the difference in impacts between the Primary and Alternative Routes, with respect to wetlands and water resources is significant, while the difference in impacts to land use, historic and archaeological resources is relatively small. Given the above comparison, the Siting Board finds that the Primary Route is preferable to the Alternative Route with respect to environmental impacts. Finally, the Siting Board finds that the Primary Route is preferable to the Alternative Route with respect to cost and the Alternative Route is preferable to the Primary Route with respect to reliability.

The Alternative Route would be more likely to provide continuity of service in an N-1-1 or N-2 loss of the two existing 345 kV lines, because it is geographically more separate from those existing lines and so less likely to be simultaneously affected by localized events such as a plane crash, a tornado, or brush fire. However, the increased reliability would come with an incremental cost of approximately \$11 million and would have overall greater adverse environmental impacts. The likelihood of such a contingency actually occurring in any given year is very small, and the added cost and adverse impacts described above seem, on balance, to outweigh the reliability benefits of the Alternative Route. The Siting Board therefore finds that the Primary Route is preferable to the Alternative Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

F. Substations

1. Terminal Substation

The proposed Project effectively brings 345 kV power to the mid-Cape area, whereas previously 345 kV power was limited to an area along the canal. The Project therefore includes installation of new equipment to convert 345 kV power to 115 kV in West Barnstable, near the end of the previously-constructed 345 kV-capable transmission line 120 (Exh. NSTAR-1, at 4-35). The proposed substation would include one 345/115 kV transformer, a 345 kV circuit

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breaker and disconnect switches, foundations, containment, and a six-breaker 115 kV switching facility (id.). The footprint of the proposed substation would be approximately 400 feet by 250 feet and encompass approximately 2.25 acres (id. at 4-36). The Company identified two suitably-sized, NSTAR-owned parcels with immediate access to existing transmission ROWs, referred to as the Oak Street site and the Service Road site (id.).

The Oak Street site is a 15.4-acre site located off Oak Street in West Barnstable, just north of Route 6 (Exh. NSTAR-1, at 4-36). Part of the site is currently occupied by an existing substation, and is otherwise undeveloped (id.). As measured from the planned fence line, the distance to the nearest residence is approximately 310 feet, and the distance to the nearest property line is approximately 280 feet. There is a 200-foot wide wooded buffer between the nearest residence and the site (id. at 4-37; RR-EFSB-23). There are several residences more than 500 feet from the nearest proposed fence line with significant intervening wooded buffers (Exh. NSTAR-1, at 4-37).

The Service Road site is a 5.3-acre site located off Service Road in West Barnstable (id. at 4-38). The site is currently partially occupied by an NSTAR ROW and communications tower, and is otherwise undeveloped (id.). As measured from the planned fence line, the distance to the nearest residence is about 235 feet, and the distance to the nearest property line is approximately 80 feet (id. at 4-39; RR-EFSB-23). There are six residences located within 300 feet of the proposed substation (Exh. NSTAR-1, at 4-38).

NSTAR stated that the Town of Barnstable, given the two sites, has expressed a preference that the terminal substation be built at the Oak Street Site (Tr. 5, at 752). NSTAR stated that Barnstable was chiefly concerned about adequate visual screening from Oak Street, and also about visibility from Route 6 (id.).

a. Environmental Impacts

i. Wetlands and Water Resources

The Oak Street site contains one small vegetated wetland south of the existing substation (Exh. NSTAR-1, at 5-29). The Company stated that it will design the substation at the Oak Street Site to avoid this wetland (id.; Tr. 5, at 760)). There are no wetlands on or near the Service Road site (Exh. NSTAR-1, at 5-29). There are no surface water resources on or near either the Oak Street or Service Road sites (id. at 5-37).

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The Oak Street site is located within a Barnstable Aquifer Protection District (id. at 5-39). The Aquifer Protection District includes all areas in the town that do not fall within a Wetland or Groundwater Protection District (Tr. 5, at 761). The Service Road site is located within Barnstable's Groundwater Protection District (Exh. NSTAR-1, at 5-30). The Groundwater Protection District carries more restrictive limitations than the Aquifer Protection District (id. at 5-39).

ii. Land Impacts and Cultural Impacts

There is no mapped Priority or Estimated Habitat on or in the vicinity of the Oak Street Site or the Service Road Site (Exh. NSTAR-1, at 5-34).

The Oak Street site is located within the Old King's Highway Regional Historic District listed in the State Register of Historic Places (id. at 5-47). There are an additional four listed resources within one-half mile of the site (id.). The Company stated that it will be in consultation with the Old King's Highway District Commission to ensure that the proposed substation is consistent with the district (Exh. EFSB-G-3(S5) at 1-18). There are no previously recorded archaeological sites within the Oak Street site, and there are four previously recorded sites within the vicinity of the site (Exh. NSTAR-1, at 5-48). Half of the site was identified as having moderate or high sensitivity for containing archaeological resources (id.).

The Service Road site is within one-half mile of the Old King's Highway Historic District (id. at 5-49). There are no previously recorded archaeological sites within the Service Road site, and there are three previously recorded archaeological sites located in the vicinity (id.). Half of the Service Road site was identified as having moderate or high sensitivity for containing archaeological resources (id.).

iii. Noise Impacts

As with transmission line construction, substation construction would typically take place between the hours of 7 a.m. and 6 p.m., weekdays, and will last approximately eight to ten months at the terminal substation site (Exh. EFSB-NO-1; Tr. 5, at 737). Typical noisy construction equipment at the substation site includes excavators and bulldozers, dump trucks, cranes, concrete mixer trucks, and soil compactors (Exh. EFSB-NO-2). The Company calculated a maximum construction noise level at the nearest residence based on simultaneous use of several noisy pieces of equipment at 92 dBA (Exh. EFSB-NO-3). The Company characterized

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the ambient noise near the substation sites as dominated by noise from Route 6 (Exh. NSTAR-1, at 5-64).

The proposed terminal substation at either site will include a 345 to 115 kV low-noise transformer that, nevertheless, does generate some noise (id. 5-63; Exh. EFSB-NO-8; Tr. 5, at 742). The Company measured background noise levels at several points adjacent to both substation sites and calculated the noise generated by the new transformer (Exh. NSTAR-1, at 5-64). The closest residence to the Oak Street site may experience a 4.6 dBA increase over nighttime noise levels, with a 5.2 dBA increase at the closest residential property line. The closest residences (approximately eleven) to the Service Road site may experience an increase of 7.1 dBA over nighttime noise levels, with a 15.8 dBA increase at the closest residential property line (id. at 5-65).<sup>37</sup>

#### iv. Visual Impacts

As described above, the footprint of the proposed terminal substation will be approximately 400-feet by 250 feet, and will encompass approximately 2.5 acres (Exh. NSTAR-1, at 5-58). The tallest new facilities will be no more than 25 feet tall, with the exception of the poles which will carry the transmission line into and out of the substation, which will be approximately 90 feet tall (id.).

There are no residences that will have a partial or unobstructed view of the Oak Street Site. The Oak Street Site is located on the same property as an existing NSTAR substation, and approximately 200 feet north of Route 6 (id.). The proposed new substation at the Oak Street site would be visible from Oak Street and Route 6 where the existing ROW is cleared, but there is a partial intervening tree buffer (id.). The West Barnstable Civic Association raised concerns with the Company with respect to views of the existing and new substation from Oak Street and Route 6 (Tr. 5, at 752).

There are three residences that have a partial view of the Service Road Site (Exh. EFSB-V-4). The Service Road site is also adjacent to Route 6, and is and parallel to Service Road and

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<sup>37</sup> In order to meet the MassDEP Noise Pollution Policy limiting an increase in L<sub>90</sub> ambient to less than 10 dBA, the Company indicated it would be required to install a sound wall at the Service Road site (Exh. EFSB-NO-5).

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therefore the proposed new substation at the Service Road site would also be visible from Route 6 and partially visible from Service Road (Exh. NSTAR-1, at 5-59).

Regardless of the site chosen, the Company will supplement existing vegetation in order to reduce views of the substation from nearby roads and residences (Exhs. NSTAR-1, at 5-59; EFSB-G-3(S5) at 2-5)). The Company described that generally the screening will consist of a mixture of native deciduous and evergreen species; such screening may not entirely block views due to safety concerns, but will partially obstruct the views (Exh. EFSB-G-3(S5) at 2-3). For the Oak Street site, the Company has agreed to provide an integrated landscaping plan to encompass both the existing Oak Street substation and the new substation (Tr. 5, at 751; Tr. 7, at 976). The plan will provide vegetative screening of the substation from these roads. The substation, built at either site, will have permanently installed lighting which will be left off unless work is being conducted in the station, or in cooperation with law enforcement officials in the event of a security threat (Exh. EFSB-V-11).

v. Traffic Impacts

As with the construction of the transmission portion of the Project, the Company does not anticipate that construction of the terminal substation will negatively impact traffic (Exh. NSTAR-1, at 5-19). The Company states that terminal substation construction would require several different crews of different sizes ranging in size from four to twelve workers per crew (Exh. EFSB-T-2). As with the transmission line construction, workers would park their personal vehicles at the substation or an off-ROW staging area (id.).

vi. Air Impacts

Sulfur hexafluoride (“SF<sub>6</sub>”) gas has been identified as a non-toxic but highly potent greenhouse gas (“GHG”). The Massachusetts Clean Energy’s Energy and Climate Plan<sup>38</sup> adopts a 2020 statewide GHG emissions limit of 25 percent below 1990 emissions levels and sets forth an integrated portfolio of policies to reach the Commonwealth’s clean energy and climate goals.<sup>39</sup> One of the policies set forth in the Plan is reducing SF<sub>6</sub> emissions by 2020 equivalent to

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<sup>38</sup> On December 29, 2010, the Secretary of Energy and Environmental Affairs issued the Massachusetts Clean Energy and Climate Plan for 2020. See G.L. c. 21N.

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a reduction of 0.2 million metric tons of CO<sub>2</sub>, which would reduce state-wide GHG emissions by approximately 0.2 percent.

NSTAR calculates SF<sub>6</sub> emission rates by the mass balance approach, *i.e.*, weighing the SF<sub>6</sub> gas left in storage at the end of the year and subtracting that amount from the weight at the beginning of the year (Tr. 5, at 764). This difference accounts for the amount used to top off equipment which had leaked as well as the gas used to fill new equipment, which can then be calculated (*id.* at 765).

As of December 31, 2010, NSTAR's reported system-wide nameplate capacity is 67,207 pounds of SF<sub>6</sub> gas (Exh. EFSB-S-2). For 2010, NSTAR reported the emission of 2,257 pounds of SF<sub>6</sub>, for a leakage rate of 3.36 percent (*id.*). NSTAR would install seven new gas-insulated circuit breakers at the terminal substation that would require a total of 793 pounds of SF<sub>6</sub> (*id.*).

SF<sub>6</sub> equipment is filled by NSTAR or contractor personnel working under NSTAR supervision (Exh. EFSB-S-2). The equipment is typically filled once in its lifetime by NSTAR personnel who have been trained by the equipment manufacturer and follow the equipment filling instruction guide (*id.*). SF<sub>6</sub> is shipped in U.S. Department of Transportation ("USDOT") approved cylinders and is handled in accordance with the gas and equipment manufacturers' work practices (*id.*). NSTAR instituted a gas cylinder management program to control gas use and provide accurate tracking for reporting (*id.*). In addition, all gas breakers are constantly monitored for gas density (*id.*). When a gas loss is detected, NSTAR conducts appropriate maintenance (*id.*). When equipment is retired, the SF<sub>6</sub> gas is recovered and reclaimed by a specialty gas vendor, minimizing atmospheric releases (*id.*). Currently, NSTAR noted that it has been installing SF<sub>6</sub> breakers that have an emission rate below the industry average (*id.*).

As with the construction for the new transmission portion of the Project, the Company has committed that all diesel-powered non-road construction equipment with ratings of 50 hp and above used for 30 days or more over the course of Project construction will have USEPA-verified (or equivalent) emission control devices installed (Exh. NSTAR-1, at 5-18).

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<sup>39</sup> SF<sub>6</sub> is a GHG that is 23,900 times more potent than CO<sub>2</sub>. One pound of SF<sub>6</sub> has the same global warming impact as eleven tons of CO<sub>2</sub>. *See* the Massachusetts Clean Energy and Climate Plan for 2020, at 77.

vii. Conclusion on Terminal Substation Environmental Impacts

The Oak Street site has one isolated wetland which can be avoided during construction, and the Service Road Site has none. The Service Road site is located in a more protective drinking water protection district. Both sites are within or near the Old King's Highway Regional Historic District, and both sites have similar likelihood for containing archeological resources. Construction noise would be very similar at both sites, but the Service Road site has more residences in close proximity than the Oak Street site. Operation at the Service Road site would result in a larger increase above ambient noise levels for residences near the Service Road Site,

While there are no residences with a view of the Oak Street site, several residences would have a view of the substation were it constructed on the Service Road site, and substations at either site would be visible from nearby roadways. The traffic impacts would be similar at both sites, as would the air impacts from SF<sub>6</sub> and construction equipment. Based on this comparison, the Siting Board finds that the Oak Street site is preferable to the Service Road site for construction of the terminal substation with respect to environmental impacts.

b. Cost

The Company estimated that construction of the terminal substation at the Oak Street site would cost \$20.4 million (Exh. NSTAR-1, at 4-39). The Company estimated that construction at the Service Road site would cost \$22.0 million (id.). The equipment required at either site would be the same; however, the Service Road site would require more earth work (id.). The Siting Board finds that the Oak Street site is preferable to the Service Road site, with respect to cost.

c. Reliability

The Company assessed the reliability of the two substation sites as equal (Exh. NSTAR-1, at 4-39). Both substation sites are large enough for safe operation of the substation (id.). The Siting Board finds that the Oak Street site and the Service Road site are comparable with respect to reliability.

d. Conclusions on Terminal Substation

Based on the above, the environmental impacts at the Service Road site are greater than those at the Oak Street site. The cost of constructing the substation at the Oak Road site is less than the Service Road site and the two sites are comparable with respect to reliability. In

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addition, the Town of Barnstable has expressed a preference for locating the substation at the Oak Street site. Accordingly, the Siting Board finds that construction of the terminal substation at the Oak Street site is preferable to the Service Road site.

However, in order to minimize construction noise impacts, the directive for the Company to conduct all Project construction between the hours of 7 a.m. and 6 p.m. weekdays only, excluding holidays, absent authorization from the relevant municipal authorities or the Siting Board in Section V.B.5.d, above, also applies to the terminal substation construction. The directive to develop a community outreach plan for Project construction in Section V.B.5.d, above, also applies to the terminal substation construction. With respect to operational noise impacts, there would be some increase in nighttime noise levels (4.6 dBA) which would occur due to installation of a new transformer at the terminal substation, which is within levels previously accepted by the Siting Board. NSTAR does not anticipate substantial traffic impacts at the Oak Street Site. However, we do not have substantial information about parking plans and other traffic impacts. Therefore, the condition regarding a Support Site and Substation/Switching Station Plan in Section V.B.8.c, above also applies to the terminal substation site at Oak Street.

With respect to visual impacts, no residences will have a direct view of the terminal substation, but a direct view would appear along Oak Street and Route 6. The Company has agreed to provide an integrated landscape plan for both the existing substation and the new substation located at the Oak Street site. The plan will provide vegetative screening of the substation from these roads. However, given the direct views, stated concerns by the Town of Barnstable and the exemption from site plan approval discussed below in Section VII.A.4, the Siting Board directs the Company to develop and implement the integrated landscape plan to screen the proposed substation from Oak Street and Route 6, and to consult with the Town of Barnstable regarding the plan. The Siting Board further directs the Company to submit a landscaping plan for the substation in West Barnstable for approval to the Board prior to construction.

The Company will be installing equipment at the Oak Street site which contains approximately 793 pounds of SF<sub>6</sub>. The Company trains any employees who handle SF<sub>6</sub> and monitors gas density of all SF<sub>6</sub> containing equipment. As with the new transmission construction, NSTAR has committed to using only diesel non-road equipment with engine

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ratings of 50 hp and above used for 30 or more days over the course of the Project which are equipped with EPA-verified (or equivalent) emission control devices. The condition requiring these emission control devices in Section V.B.9, above, also applies to construction at the terminal substation site. With the implementation of the conditions above, the Siting Board finds that the environmental impacts of the terminal substation at the Oak Street site would be minimized.

## 2. Carver Substation

Carver Substation is the existing substation where the transmission portion of the Project will originate. The existing substation is on a 13.3-acre NSTAR-owned site in Carver (Exh. NSTAR-1, at 1-9). Work at Carver Substation would expand the footprint of the substation by approximately one acre, and include installation of a new 345 kV circuit breaker position (Exh. EFSB-G-3(S2) at 2-5). Although approximately one half acre of tree clearing would occur, no homes will experience any increased visual impact from tree clearing or construction at Carver Substation (*id.*; Tr. 5, at 745). As with the terminal substation, Carver Substation will have permanently installed lighting which will be left off unless work is being conducted in the station, or in cooperation with law enforcement officials in the event of a security threat (Exh. EFSB-V-11). There would be no impact to wetlands or water resources at Carver Substation. The construction noise impacts at Carver Substation will be similar to those at the terminal substation, except that there is less earthwork required at Carver Substation, therefore the noise impact will be less and for a shorter duration than at the terminal substation (Tr. 5, at 736). The overall construction length for Carver Substation would be 8 to 10 months (*id.* at 734). With respect to air impacts, the Company has committed to using retrofitted diesel non-road construction equipment, as stated above. In addition, two new gas-insulated circuit breakers at Carver Substation will include approximately 814 pounds of SF<sub>6</sub>. Please see discussion in Section V.F.1.a, above, with respect to NSTAR's practices regarding SF<sub>6</sub>. With respect to traffic impacts, the impacts will be similar to those at the terminal substation, described above.

All conditions described herein that are intended to minimize impacts with respect to wetlands, land use, noise, visual, traffic, air and other environmental impacts also apply to any construction taking place at the Carver Substation. With implementation of these conditions, the Siting Board finds that the environmental impacts at Carver Substation have been minimized.

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### 3. Bourne Switching Station

Bourne Switching Station is an existing station located in Bourne on the Massachusetts Military Reservation. In order to accommodate passage of the new 345 kV line, the station will include an expanded 115 kV bus, new switching positions with breakers and a new control house (Exh. EFSB-G-3(S2) at 5-23). However, the station footprint will not be expanded during this Project (Exh. EFSB-G-3(S5) at 2-8).<sup>40</sup> The changes at the station will not increase visual impacts from public ways and will not affect noise levels at the substation (Exh. EFSB-G-3(S2) at 5-23). The station is located in mapped priority habitat, and the mitigation regarding the eastern box turtle, discussed in Section V.B.4, above includes the expansion and work at Bourne Switching Station (id.). There are no wetland or water resources in the vicinity of the station (id.). SF<sub>6</sub> will be used in the switchgear at the Bourne Switching Station. Please see the discussion of NSTAR's practices with respect to SF<sub>6</sub> in Section V.F.1.a, above.

### G. Monitoring Project Cost

As discussed in Section IV.E.5, above, the Attorney General recommends that the Siting Board monitor the construction progress and expenditures associated with the Project by requiring quarterly compliance filings<sup>41</sup> by NSTAR to the Siting Board (Attorney General Brief at 30, 31, citing GSRP, EFSB 08-2/DPU 08-105/106, at 140) (Siting Board required WMECo to provide semi-annual updates on construction costs for a 345 kV and 115 kV transmission project with ancillary facilities). The Attorney General states that the reason for the request is to ensure

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<sup>40</sup> Initially, the design of the Bourne Switching Station would require expansion of the footprint by 0.4 acres, as well as 0.4 acres of tree clearing. Based on comments on the DEIR, the Company amended the design to include gas insulated switchgear instead of air insulated switchgear, allowing the switchgear to fit within the existing fenceline (Exh. EFSB-G-3(S5) at 2-8). However, NSTAR would construct a bridge structure for the termination of Line 120 and a small control structure outside of the fenceline (id.)

<sup>41</sup> The filings would include, inter alia, documentation of reviews and approvals of budgets; account numbers; work order numbers; ISO-NE and NEPOOL reviews; the estimated cost and breakdown of individual expenses of complying with regulatory conditions; and on a quarterly basis and upon a schedule change of more than one month or a cost change of the project of more than one percent of the original budget, the following: the date NSTAR discovered the need for a project change, a description of the change, original and revised cost estimates, the reason for the change, and the approving entity (AG Brief at 32).

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that the Project serves the public convenience and is consistent with the public interest in the event of significant cost overruns (id. at 30).

Although the Siting Board does not have jurisdiction over regulatory cost recovery, the Siting Board's statutory mandate concerning the Project is to review the need for, *cost of*, and environmental impacts of transmission lines. G.L. c 164, § 69H (emphasis added) (see GSRP at 141). However, the Siting Board finds that semi-annual compliance filings versus quarterly compliance filings, at least prior to any identified problems with cost containment, are adequate to obtain the specified information. Additionally, although we appreciate and share the Attorney General's interest in making the reporting process meaningful, given the detailed nature of the requested information, we are not persuaded that such voluminous information is necessary at this time.

Therefore, in order to review the costs of the Project, and in an effort to better understand the factors that may lead to cost overruns and delays in construction of Siting Board-approved facilities, we direct the Company, prior to the start of construction, to submit to the Board an updated and certified cost estimate for the Project. Additionally, we conclude that semi-annual compliance filings by NSTAR to the Siting Board are a reasonable and prudent condition to our approval of the proposed Project. We direct NSTAR to file semi-annual compliance reports with the Siting Board and all parties, starting within 60 days of the commencement of construction, that include projected and actual construction costs, projected and actual segment completion dates, explanations for any discrepancies between projected and actual costs and completion dates, and an explanation of the Company's internal capital authorization approval process.<sup>42</sup>

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<sup>42</sup> In its comments to the Tentative Decision, GenOn asks the Board to modify its condition that implements this reporting requirement, to state that the Board may decide to conduct a project change proceeding if the projected or actual completion costs exceed the projected cost as stated in the Final Decision. While the Board agrees with GenOn that the projected cost as stated in this decision is an integral part of the balancing of reliability, environmental impacts and cost upon which today's Final Decision rests, we decline to modify the condition at this time. If, in the future, the certified cost update or any semi-annual compliance report shows an increase in projected or actual costs, then the Board can consider and decide what course of action, including requesting a project change filing, would be proper by examining all the circumstances that arise at that time.

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H. Conclusion

The Siting Board finds that the information provided by the Company regarding the Project's environmental impacts is substantially accurate and complete. Based on the information presented in Section V, above, the Siting Board finds that with the implementation of the specified mitigation and conditions, and compliance with all local, state and federal requirements, the environmental impacts of the proposed Project along the Primary Route with the Oak Street Substation would be minimized.

Based on its review of the record, the Siting Board finds that the Company provided sufficient information regarding cost, reliability, and environmental impacts 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 the proposed Project along the Primary Route with the Oak Street Substation would achieve an appropriate balance among conflicting environmental concerns as well as between environmental impacts, reliability, and cost.

VI. CONSISTENCY WITH POLICIES OF THE COMMONWEALTH

A. Standard of Review

G.L. c. 164, § 69J requires the Siting Board to determine whether plans for construction of an applicant's new facilities are consistent with current health, environmental protection, and resource use and development policies as adopted by the Commonwealth.

B. Analysis

1. Health Policies

In Section 1 of the Electric Utility Restructuring Act of 1997, the Legislature declared that "electricity service is essential to the health and well-being of all residents of the Commonwealth . . ." and that "reliable electric service is of utmost importance to the safety, health, and welfare of the Commonwealth's citizens . . ." See c. 164 of the Acts of 1997, Sections 1(a) and (h). In Section III, above, the Siting Board found that the Project will improve the reliability of electric service in Tremont East. In addition, in Section V, the Siting Board requires the Company to use only retrofitted off-road construction vehicles to limit emissions of particulate matter during Project construction. This condition is consistent with MassDEP's Diesel Retrofit Program designed to address health concerns related to diesel emissions. In

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Section V, the Siting Board finds that the proposed Project's EMF, traffic, air impacts, and hazardous materials impacts have been minimized.

Accordingly, subject to the specified mitigation and the Siting Board's 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 policies of the Commonwealth.

## 2. Environmental Protection Policies

In Section V.B, above, the Siting Board reviews how the Project will meet various state environmental protection requirements. The Siting Board also: (1) considers the Project's environmental impacts, including those related to wetlands and water resources, endangered species, land use, historical and archeological resources, air emissions, noise and visual impacts; and (2) concludes that subject to the specified mitigation and conditions set forth in this Decision, the Project's environmental impacts have been minimized. See Section IX, below, for a discussion of the Greenhouse Gas Policy and Protocol.

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

## 3. Resource Use and Development Policies

In 2007, pursuant to the Commonwealth's Smart Growth/Smart Energy policy produced by the Executive Office of Energy and Environmental Affairs, Governor Patrick established Sustainable Development Principles. Among the principles are: (1) supporting the revitalization of city centers and neighborhoods by promoting development that is compact, conserves land, protects historic resources and integrates uses; (2) encouraging reuse of existing sites, structures and infrastructure; and (3) protecting environmentally sensitive lands, natural resources, critical habitats, wetlands and water resources and cultural and historic landscapes. In Section V, the Siting Board reviews the process by which the Company sited the Project. The Siting Board notes that the Project is located almost wholly within existing overhead utility rights-of-way. Additionally, the Project has been designed and conditioned to avoid or minimize impacts to natural and cultural resources.

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

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

Pursuant to G.L. c. 40A, § 3, the Company requests individual zoning exemptions and comprehensive zoning exemptions for the proposed Project from the Zoning Bylaws of the Towns of Carver, Plymouth, and Bourne, and the Zoning Ordinance of the Town of Barnstable.<sup>43</sup>

### A. Individual Zoning Exemptions

#### 1. Standard of Review

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

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

Thus, a petitioner seeking exemption from a local zoning by-law under G.L. c. 40A, § 3 must meet three criteria. First, the petitioner must qualify as a public service corporation. Save the Bay, Inc. v. Department of Public Utilities, 366 Mass. 667 (1975) (“Save the Bay”). Second, the petitioner must demonstrate that its present or proposed use of the land or structure is reasonably necessary for the public convenience or welfare. Massachusetts Electric Company, D.T.E. 01-77, at 4 (2002) (“MECo (2002) Decision”); Tennessee Gas Pipeline Company, D.T.E. 01-57, at 3-4 (2002) (“Tennessee Decision (2002)”). Finally, the petitioner must establish that it requires exemption from the zoning ordinance or by-law. Boston Gas Company, D.T.E. 00-24, at 3 (2001) (“Boston Gas Decision”).

<sup>43</sup> G.L. c. 40A, § 3 is a Department statute. The Department refers zoning exemption cases to the Siting Board for hearing and decision pursuant to G.L. c. 25, § 4. When deciding cases under a Department statute, the Siting Board has the power and the duty: to accept for review and approval or rejection any application, petition or matter related to the need for, construction of, or siting of facilities referred by the chairman of the department . . . provided, however, that in reviewing such application, petition or matter, the board shall apply department and board standards in a consistent manner. G.L. c. 164, § 69H.

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2. Public Service Corporationa. Standard of Review

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

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

Save the Bay at 680. See also, Boston Gas Decision, D.T.E. 00-24, at 3-4; Berkshire Power Development, Inc., D.P.U. 96-104, at 26-36 (1997) (“Berkshire Power”).<sup>44</sup>

b. Analysis and Conclusion

The Company is an electric company as defined by G.L. c. 164, § 1 and, as such, qualifies as a public service corporation. NSTAR Electric Company, D.P.U. 09-136//09-137, at 7 (2011) ; NSTAR Electric Company, D.P.U. 08-1, at 7 (2007); Exh. NSTAR-2, at 2. Accordingly, the Siting Board finds that the Company is a public service corporation for the purposes of G.L. c. 40A, §3.

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<sup>44</sup> The Department interprets this list not as a test, but rather as guidance to ensure that the intent of G.L. c. 40A, § 3 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. See Berkshire Power, D.P.U. 96-104, at 30; Save the Bay at 685-686; Town of Truro v. Department of Public Utilities, 365 Mass. 407 (1974) (“Town of Truro”). The Department has interpreted the “pertinent considerations” as a “flexible set of criteria which allow the Department to respond to changes in the environment in which the industries it regulates operate and still provide for the public welfare.” Berkshire Power, D.P.U. 96-104, at 30; see also Dispatch Communications of New England d/b/a Nextel Communications, Inc., D.P.U./D.T.E. 95-59-B/95-80/95-112/96-113, at 6 (1998). The Department has determined that it is not necessary for a petitioner to demonstrate the existence of “an appropriate franchise” in order to establish PSC status. See Berkshire Power, D.P.U. 96-104, at 31.

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3. Public Convenience or Welfarea. Standard of Review

In determining whether the present or proposed use is reasonably necessary for the public convenience or welfare, the Department must balance the interests of the general public against the local interest. Save the Bay at 680; Town of Truro at 407. Specifically, the Department is empowered and required to undertake “a broad and balanced consideration of all aspects of the general public interest and welfare and not merely [make an] examination of the local and individual interests which might be affected.” New York Central Railroad v. Department of Public Utilities, 347 Mass. 586, 592 (1964) (“New York 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; New York Central Railroad at 592.

Therefore, when making a determination as to whether a petitioner’s present or proposed use is reasonably necessary for the public convenience or welfare, the Department examines: (1) the need for, or public benefits of, the present or proposed use; (2) the present or proposed use and any alternatives or alternative sites identified;<sup>45</sup> and (3) the environmental impacts or any other impacts of the present or proposed use. The Department then balances the interests of the general public against the local interest and determines whether the present or proposed use of the land or structures is reasonably necessary for the convenience or welfare of the public. Boston Gas Decision, D.T.E. 00-24, at 2-6; MECo (2002) Decision, D.T.E. 01-77, at 5-6; Tennessee Decision (2002), D.T.E. 01-57, at 5-6; Tennessee Gas Company, D.T.E. 98-33, at 4-5 (1998).

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<sup>45</sup> 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); New York Central Railroad at 591.

b. Analysis and Conclusion

With respect to need for, or public benefits of, the Project, the Siting Board found in Section III, above, that (1) the existing electric system is inadequate under certain contingencies to reliably serve current and projected loads in the Tremont East area; and (2) the proposed Project will address these reliability issues.

Regarding alternatives, in Section IV, the Siting Board analyzed a number of different project approaches other than the Company's proposed alternative that the Company might use to meet the reliability need (such as energy efficiency, demand response, and new generation) and concludes that the proposed approach is preferable to other approaches. The Siting Board also reviewed the Company's route selection process in Section V.A, and determined that the Company applied a reasonable set of criteria for identifying and evaluating routes to ensure that no clearly superior route was missed. The Siting Board also compares the benefits of the Primary and Alternative Routes and concludes that the Primary Route is preferable to the Alternative Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Finally, regarding Project impacts, in Section V.B, the Siting Board reviews the environmental impacts of the Project and finds, while the Project may result in some local adverse impacts, generally, with the implementation of certain mitigation and conditions, the impacts of the Project would be minimized. The Siting Board also finds that residents in Tremont East will benefit from the Project as it will improve the reliability of electricity delivery.

Based on the foregoing, the Siting Board finds that the general public interest in constructing the Project outweighs any adverse local impacts. Accordingly, the Siting Board finds that the proposed Project is reasonably necessary for the convenience or welfare of the public.

4. Individual Exemptions Required

a. Standard of Review

In determining whether exemption from a particular provision of a zoning by-law is "required" for purposes of G.L. c. 40A, § 3, the Department looks to whether the exemption is necessary to allow construction or operation of the petitioner's project. See MECo Decision (2002), D.T.E. 01-77, at 4-5; Tennessee Decision (2002), D.T.E. 01-57, at 5; Western Massachusetts Electric Company, D.P.U./ D.T.E. 99-35, at 4, 6-8 (1999); Tennessee Gas

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Company, D.P.U. 92-261, at 20-21 (1993). It is a petitioner's burden to identify the individual zoning provisions applicable to the project and then to 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 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.

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

b. Exemptions Sought and Analysis

(1) Carver

i. Exemptions Sought

The portion of the Project in Carver includes expansion of the existing NSTAR substation and construction of approximately 4.3 miles of new 345 kV transmission line (Exh. NSTAR-2, at 15; Company Brief at 161). The substation expansion work will occupy approximately one acre of NSTAR-owned property (Exh. NSTAR-2, at 3). The Company seeks exemption from certain provisions of the Carver Zoning Bylaw to construct this portion of the Project, as set forth in Table 4, below (Exhs. NSTAR-2, at 15-24; EFSB-Z-4 (S)).<sup>46</sup>

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<sup>46</sup> The sources for the information in the Tables 4 through 7 are: Exhs. NSTAR-2; EFSB-Z-4(S); and EFSB-Z-5(S).

**Table 4. Requested Carver Zoning Bylaw Exemptions**

| Subject                                       | Zoning Bylaw Provision |
|---|------------------------|
| Use   | Sections 2230; 2210    |
| Frontage                                      | Sections 2320; 2340    |
| Rear yard dimensional requirements            | Section 2320           |
| Side yard requirements                        | Section 2320           |
| Lot width                                     | Section 2320           |
| Site plan review                              | Section 3100           |
| Height  | Section 2320           |
| Landscaping                                   | Sections 3200; 3220    |
| Parking and loading                           | Section 3300           |
| Wetlands overlay district                     | Section 4400           |
| Disturbances                                  | Section 3610           |
| Signs   | Section 3500           |
| Water resource protection—hazardous materials | Section 4300           |
| Erosion Control                               | Section 3620           |

ii. Analysis and Conclusion

The Carver substation is located in a residential-agricultural (RA) zoning district (Exh. NSTAR 2, at 16). In Carver, a public utility is not listed as a permitted use in this district, and the Bylaw prohibits the granting of use variances in any residential district (Exhs. NSTAR-2, at 16-17; NSTAR-2, Att. B at ¶ 5222; EFSB-Z-4(S)). Therefore, without an exemption, the Company would be precluded from constructing the Project in Carver. See G.L. c. 40A, §10. Accordingly, we find that the Company requires an exemption from the requirements in Sections 2230 and 2210 (general use regulations) and 4400 (wetlands overlay district regulations).

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The Company states that two provisions of the Bylaw would require the Company to obtain a special permit, which could result in an adverse outcome, a burdensome requirement, or delay in Project construction due either to the need to obtain the special permit or to a potential appeal of the special permit decision (Exhs. NSTAR-2, at 21, 23; EFSB-Z-5(S)). We thus find that exemption from Section 3300 (parking) and 4300 (water resource protection-hazardous materials) is required. The Company asserts that compliance with certain provisions could be inconsistent with industry standards (Exh. NSTAR-2, at 20-22). For this reason, exemption from Section 3100 (site plan review), Sections 3200 and 3220 (landscaping) and Section 3500 (signs) is required. For a number of provisions, the Company is uncertain about the applicability of the provisions to the Project and states that if the provisions are applicable, variances would be required (*id.* at 18-20, 22-23; Exh. EFSB-Z-5(S)). Based on the legal difficulty and potential project delay involved in obtaining variances, we find that exemptions are required from Sections 2320 and 2340 (minimum frontage), 2320 (side yard dimensions), 2320 (rear yard dimension), 2320 (building height), 2320 (minimum lot width), and 3620 (erosion control).

With respect to Section 3610 (disturbances), the Company states that it requires exemption from the Section's noise restriction for both construction and operation of the substation. Section 3610, however, exempts temporary construction noise from its noise restriction (Exh. NSTAR-2, Att. B at ¶ 3610). Accordingly, the Siting Board finds that the Company requires exemption from the noise prohibition in Section 3610 only for operation of the substation.<sup>47</sup> Additionally, the Siting Board finds that the Company has not demonstrated that it requires exemption from the vibration, odor and flashing lights restrictions in Section 3610. These restrictions pertain to the ongoing operation of the substation rather than its construction, and, absent a showing of necessity, the Siting Board disfavors elimination of local zoning control over the ongoing operation of a proposed facility. See GSRP, EFSB 08-2/D.P.U. 08-105/08-106, at 137; Braintree Electric Light Department, 16 DOMSB 78, at 186-187 (2008) (“BELD”).

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<sup>47</sup> The Company stated that it will mitigate operational noise of the substation as necessary to comply with the Massachusetts Department of Environmental Protection noise regulations (Exh. NSTAR-2, at 22).

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(2) Plymouth

i. Exemptions Sought

The portion of the Project in Plymouth consists of modifications to the existing State Forest Transition Station, construction of the new Plymouth Crossover Station and construction of approximately 11.8 miles of new 345 kV transmission line (Exh. NSTAR-2, at 24; Company Brief at 164-165). The Company seeks exemption from certain provisions of the Plymouth Zoning Bylaw to construct this portion of the Project, as set forth in Table 5, below (Exhs. NSTAR-2, at 24-31; EFSB-Z-4 (S); EFSB-Z-5(S)).

**Table 5. Requested Plymouth Zoning Bylaw Exemptions**

| <b>Subject</b>                                    | <b>Zoning Bylaw Provision</b>            |
|---|--|
| Use   | Sections 205-38; 205-40; 205-42; Table 5 |
| Height  | Sections 205-3; 205-17; 205-20; Table 5  |
| Design review                                     | Section 205-12                           |
| Dimensional requirements                          | Section 205-22; Table 5                  |
| Frontage  | Section 205-17E                          |
| Building siting and topography                    | Sections 205-17G; 205-18; 205-39         |
| Signs   | Section 205-19                           |
| Special permit uses                               | Section 205-27                           |
| Site plan review                                  | Section 205-32                           |
| Parking   | Section 205-23                           |
| Off street loading                                | Section 205-24                           |
| Aquifer protection overlay district               | Section 205-57                           |
| Floodplain overlay district                       | Section 205-58                           |
| Procedures for zoning permits and special permits | Section 205-5, 205-27                    |

ii. Analysis and Conclusion

The proposed transmission line in Plymouth traverses the rural residential (RR) and medium lot residential (R-25) zoning districts (Exh. NSTAR-2, at 24).<sup>48</sup> In Plymouth, utilities are not a use expressly permitted in these districts and the Zoning Bylaw does not provide the Zoning Board of Appeals with authority to grant use variances (id. at 24-25). Therefore, without an exemption, the Company would be precluded from constructing the Project in Plymouth (id.).

<sup>48</sup> The State Forest Transition Station and the proposed Plymouth Crossover Station are in an RR district (Exh. NSTAR-2, at 24)..

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See G.L. c. 40A, § 10. Accordingly, we find that exemption is required from the use requirements in Section 205-38 (use prohibitions), 205-40 (RR district regulations), 205-42 (R-25 district regulations), Table 5 (general use requirements), Section 205-58 (floodplain overlay district regulations) and Section 205-57 (aquifer protection overlay district regulations).

The Company states that compliance with the special permit provisions in Sections 205-5 (procedures for special permits) and 205-27 (special permit uses) could result in an adverse outcome, a burdensome requirement or delay in project construction (Exhs. NSTAR-2, at 24-26; EFSB-Z-5(S)). Accordingly, we find that the requested exemptions are required. The Company states that several provisions would require it to seek a variance (Exhs. NSTAR-2, at 27-31; EFSB-Z-5(S)). Based on the legal difficulty and potential project delay involved in obtaining variances, we find that exemptions are required from Sections 205-3 (definitions), 205-17 (lot regulations), 205-20 (utility service: height restriction), Table 5 (height); 205-17E (frontage); 205-22 ; Table 5 (front and rear yard setbacks); 205-23 (off-street parking); and 205-24 (off-street loading). The Company seeks a number of exemptions on the basis of a potential conflict with industry standards (Exh. NSTAR-2, at 27-31). On this basis, exemptions to Section 205-12 (design review); 205-32 (site plan review); 205-17G ; 205-18 and 205-39 (building siting and topography); and 205-19 (signs) are required.

(3) Bourne

i. Exemptions Sought

The portion of the Project in the town of Bourne consists of the construction of approximately 1.8 miles of new 345 kV transmission line and the expansion of the existing Bourne switching station (Exh. NSTAR-2, at 32; Company Brief at 167-168). The Company seeks exemption from certain provisions of the Bourne Zoning Bylaw to construct the new transmission line, as set forth in Table 6, below (Exh. NSTAR-2, at 32-36).

**Table 6. Requested Bourne Zoning Bylaw Exemptions**

| Subject                          | Zoning Bylaw Provision    |
|----------------------------------|---------------------------|
| Use                              | Sections 2200; 2210; 2220 |
| Use                              | Section 2230              |
| Use                              | Section 4700              |
| Use and dimensional requirements | Section 4300              |
| Height                           | Section 2500              |
| Egress, frontage requirements    | Sections 2500; 3343; 3344 |
| Site plan review                 | Sections 1230-1244        |
| Environmental controls           | Section 3400              |
| Signs                            | Section 3200              |
| Parking                          | Section 3300              |

ii. Analysis and Conclusions

The proposed transmission line in Bourne would traverse the residence (R-80), scenic development (SDD), residence (R-40) and government (GD) zoning districts (Exh. NSTAR-2, at 32).<sup>49</sup> In Bourne, utility uses are not a permitted use in the zoning districts where the Project would be located and there is no right under the Bylaw to seek a use variance (*id.* at 32-33). Therefore, without an exemption, the Company would be precluded from building the Project in Bourne. See G.L. c. 40A, § 10. Accordingly, the Company's request for exemption from the use requirements in Sections 2200 and 2210 (use regulations), 2220 (use regulations schedule), 2230 (scenic development district use regulations), 4700 (water resource district use regulations), and 4300 (Bournedale overlay district use regulations) is required.

The Company states that compliance with Section 3300 (off-street parking) would require a variance (Exhs. NSTAR-2, at 36; EFSB-Z-5(S)). Based on the legal difficulty and

<sup>49</sup> In addition, the transmission lines would be located in the Buzzards Bay water resource district (WD), the Bournedale overlay district (BOD), and the traffic management district (TMD) (Exh. NSTAR-2, at 32).

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potential project delay in obtaining a variance, exemption from this Section is required. The Company states that compliance with Section 3200 (signs) would require a special permit or sign permit (Exh. NSTAR-2, at 36). Based on the potential for an adverse outcome, a burdensome requirement or project delay, we find that exemption from this provision is required. The Company seeks exemption from Section 2500 (height) and Sections 3343 and 3344 (vehicle egress), on the grounds that it is unclear whether these requirements apply to the Project and, if applicable, variances or a special permit would be required (id. at 34). We find that the exemptions are required.

The Company seeks exemption from Section 3400 (environmental controls), on the ground that no standards are supplied in the Bylaw defining what constitutes compliance with these requirements (id. at 35). We note that there are some provisions of Section 3400 (i.e., the lighting requirements) that the Project may not be able to comply with, without conflicting with industry standards. However, the Company has not substantiated why it cannot comply with the other requirements of Section 3400.<sup>50</sup> These requirements pertain to the ongoing operation of the Project rather than its construction, and, absent a showing of necessity, the Siting Board disfavors elimination of local zoning control over the ongoing operation of a proposed facility. See GSRP, EFSB 08-2/D.P.U. 08-105/08-106, at 137; BELD, 16 DOMSB 78, at 186-187. Accordingly, we find that exemption is required solely from the lighting requirements in Section 3400.

The Company also seeks exemption from Sections 1230-1244 (site plan review requirements) on the ground that compliance with these requirements could result in inconsistency with industry standards and in project delay (Exh. NSTAR-2, at 34-35). We find that these exemptions are required.

(4) Barnstable

i. Exemptions Requested

The portion to be performed in the town of Barnstable consists of the construction of a new substation. The Company seeks exemption from certain provisions of the Barnstable zoning

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<sup>50</sup> The Company stated that the equipment proposed in the improvements to the Bourne Switching Station will not impact existing noise levels at the switching station (Exh. NSTAR-1, at 5-68, 5-69).

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ordinance to construct the substation, as set forth in Table 7 below (Exhs. NSTAR-2, at 36-45; NSTAR-2, at 36; Company Brief at 170).

**Table 7. Requested Barnstable Zoning Ordinance Exemptions**

| Subject                                 | Zoning Bylaw Provision         |
|---|--------------------------------|
| Use                                     | Sections 240-10; 240-14; 240-7 |
| Frontage                                | Section 240-14E                |
| Front yard setback                      | Section 240-14E                |
| Height                                  | Section 240-14E                |
| Accessory use                           | Sections 240-43; 240-44        |
| One building per lot                    | Section 240-7F, 240-43         |
| Aquifer protection overlay district     | Section 240-35E                |
| Groundwater protection overlay district | Section 240-35F                |
| Site plan approval                      | Article IX                     |
| Parking                                 | Article VI                     |
| Performance bond                        | Section 240-124A               |
| Occupancy permit                        | Section 240-124B               |

ii. Analysis and Conclusions

Both of the proposed sites for the new substation are located in a residential (RF) zoning district (Exh. NSTAR-2, at 36).<sup>51</sup> Under the Barnstable Zoning Ordinance, utility uses are not a permitted use in this district and a variance would be required (id. at 37-41). Based on the legal difficulty and potential project delay in obtaining a variance, we find that exemption is required

<sup>51</sup> In addition, the Oak Street parcel is located in an aquifer protection overlay district (AP) and the Service Road site is located in a groundwater protection overlay district (Exh. NSTAR-2, at 36-37).

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from Sections 240-14A C and D (RR district regulations), and 240-35E (aquifer protection overlay district) and 240-35F (groundwater protection overlay district regulations).

The Company states that compliance with Sections 240-14E (frontage, front yard setback), 240-7F(1) and 240-43 (one building per lot); 240-35F (3) (impervious surface), and 240-35F(4) (percent of site in natural state) also could require variances (id. at 39-42). Exemption from these Sections is accordingly required. The Company is uncertain whether or how Sections 240-14E (height), 240-124A (performance bond), and 240-124B (occupancy permit) apply to the Project. If applicable, variances would be required (id. at 39, 44-45). Based on the legal difficulty and potential project delay involved in obtaining variances, we find that exemption from these Sections is required. The Company seeks exemption from the site plan approval requirements in Article 9 of the Bylaw, on the ground that compliance with these requirements could result in inconsistency with industry standards and in project delay (id. at 42-43). We find that the exemption is required.

With respect to Section 240-10 (prohibited uses), the Company states that the prohibition against injurious, noxious or offensive uses is subjective and undefined. The Company asserts that, once operational, the substation will emit sound and light that, subjectively, could be considered injurious, noxious or offensive (Exh. EFSB-Z-18). Section 240-10 does not contain an exemption for temporary construction impacts. Accordingly, the Siting Board finds that exemption from Section 240-10 is required with respect to operational noise and lighting and with respect to potential construction-related emissions of dust, smoke, vibration, noise and light.

##### 5. Community Outreach

The Siting Board favors the resolution of local issues on the local level whenever possible to reduce local concern regarding any intrusion on home rule authority. Thus, the Siting Board encourages zoning exemption applicants to consult with local officials, and in some circumstances, to apply for local zoning permits, prior to seeking zoning exemptions from the Department under G.L. c. 40A, § 3. National Grid Worcester, EFSB-09-1/D.P.U. 09-52/09-53, at 75-77; GSRP, EFSB 08-2/D.P.U. 08-105/08-106, at 132-133); Russell Biomass LLC, EFSB 07-4/DPU 07-35/07-36, at 60-63 (2009) (“Russell”).

The Company in this case did not apply to the towns for any local zoning relief before filing its Zoning Petition with the Department. However, the Siting Board has held that applying for local zoning permits in advance of filing a zoning exemption petition is not required

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where to do so would likely be futile, or where the Company has met the spirit and intent of Russell by engaging in outreach with the affected municipalities regarding the Company's plan to seek zoning relief from the Department. Other factors supporting a finding that the spirit and intent of Russell have been met are that the affected municipalities do not object to the Company seeking such relief; and that the Company has made a good faith effort to abide by the reasonable recommendations of the municipalities with respect to the Project. National Grid/Worcester, EFSB 09-1/D.P.U. 09-52/09-53, at 76-77; see also, GSRP, EFSB 08-2/D.P.U. 08-105/08-106, at 132-133.<sup>52</sup>

With respect to outreach to local authorities, NSTAR states in its Zoning Petition that it engaged in "substantial and good faith consultations" with officials in all four of the Towns regarding the Project, including consultations regarding the need for zoning exemptions from the Department (Exh NG- 2, at 9).<sup>53</sup> In each case, the Company stated, it presented the Project scope, the reason for the Project, and the impacts to the town (Exh. EFSB-Z-1). The Company stated that, in the meetings, a local town zoning officer or representative was present and the Company discussed in a general manner the need for zoning exemptions from certain town requirements as well as the need for a more comprehensive zoning exemption (id.). In the meetings with each town, the Company asserted, "the Company's approach to zoning exemptions was acknowledged and there were no objections noted" (id.). The Town of Carver affirmatively stated in a letter that it had no issues relative to the Company's plan to seek zoning exemptions from the Department (Exh. EFSB-Z-1(S) Att. E). None of the four affected municipalities intervened in the proceeding.

With respect to abiding by the reasonable recommendations of the towns regarding the Project, the Company has committed to fulfilling project-related requests received from the

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<sup>52</sup> In accord, Department of Public Utilities zoning exemption decisions: e.g., Tennessee Gas Pipeline Company, D.P.U. 11-26, at 26 (2012); New England Power Company, D.P.U. 09-136/09-137, at 34-37 (2011); New England Power Company, D.P.U. 09-27/09-28, at 47 (2010); Western Massachusetts Electric Company, D.P.U. 09-24/09-25, at 33 (2010).

<sup>53</sup> These meetings were held prior to the filing of NSTAR's Zoning Petition. NSTAR also met with Town representatives after the filing of the Zoning Petition (Exh. EFSB-Z-1(S)).

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Towns of Barnstable and Carver.<sup>54</sup> Specifically, as requested by the Town of Barnstable and the West Barnstable Civic Association, the Company will provide a new landscaping plan for and will replace previous landscaping that is no longer present on the Oak Street substation site (Tr. 7, at 976). As requested by the Town of Carver, the Company will provide the town with keys to the barriers that prevent public roadway access to the ROWs, and will allow the town to install a radio repeater on one or more transmission poles to assist the town with its emergency communications system (Tr. 7, at 978-979).

#### 6. Conclusion on Request for Individual Zoning Exemptions

As described above, the Siting Board finds that (1) the Company is a public service corporation; (2) the proposed use is necessary for the public convenience or welfare of the public; and (3) with the exceptions noted immediately following, the specifically named zoning exemptions set forth in Tables 4 through 7 are required for construction of the Project within the meaning of G.L. c. 40A, § 3.

Regarding Section 3610 of the Carver Zoning Bylaw, exemption is required only with respect to operational noise. Regarding Section 3400 of the Bourne Zoning Bylaw, exemption is required only with respect to operational lighting. Regarding Section 240-10 of the Barnstable Zoning Ordinance, exemption is required with respect to operational noise and lighting and with respect to potential construction-related emissions of dust, smoke, vibration, noise and light.

Accordingly, with the exceptions noted above, the Siting Board grants the Company's request for the individual zoning exemptions listed in Tables 4 through 7.

#### B. Comprehensive Zoning Exemptions

##### 1. Standard of Review

The Company has requested a comprehensive exemption from all four of the town zoning codes. The Siting Board will grant such requests on a case-by-case basis and only 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.. National Grid Worcester, EFSB 09-1/D.P.U. 09-52/09-53, at 81; GSRP, EFSB 08-2/D.P.U. 08-105/08-106, at 135.

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<sup>54</sup> The Towns of Bourne and Plymouth did not make project-related requests of the Company in terms of project changes or mitigation measures (Tr. 7, at 975-976).

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2. Company Position

The Company identifies the time-sensitive nature of the proposed Project as the chief basis for its request for comprehensive zoning exemptions from the four zoning codes (Exh. NG-2, at 46-47; Company Brief at 173-174). The Company also points out that comprehensive exemptions would allow the Project to go forward on a timely basis if provisions beyond those identified are deemed applicable to the Project, or if new zoning requirements are adopted in any of the towns prior to completion of the Project (Exh. NSTAR-2, at 46-47; Company Brief at 173-174).

3. Analysis and Conclusion

The granting of a comprehensive exemption falls under a stricter standard of review than the granting of individual exemptions. It is not enough to be required for construction of the project; the granting of a comprehensive exemption must also avoid substantial public harm. As compared to the granting of individual zoning exemptions, which are tailored to meet the construction and operational requirements of a particular project, the granting of a comprehensive exemption serves to nullify a municipality's zoning code in its entirety with respect to the project under review. Thus, compared to the granting of individual zoning exemptions, which entail specific demonstrations that an exemption is required, 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. Tennessee Gas Pipeline Company, D.P.U. 11-26, at 31 (2012); NSTAR Electric Company, D.P.U. 08-1, at 36-37 (2009); Russell, EFSB 07-4/D.P.U. 07-35/07-36, at 71-72; Massachusetts Electric Company, D.T.E. 04-81, at 24 (2009); Tennessee Gas Pipeline Company, D.T.E. 01-57, at 11 (2002).

Numerous Department of Public Utilities cases that have considered and granted comprehensive exemptions involved reliability-based projects that were time-sensitive and spanned several municipalities and with disparate zoning ordinances. See New England Power Company, D.P.U. 09-136/09-137, at 49 (2011); New England Power Company, D.P.U. 09-27/09-28, at 52 (2010); Western Massachusetts Electric Company, D.P.U. 09-24/09-25, at 36 (2010).

Here, while the Project is reliability-based, complex, and involves the zoning ordinances of four separate municipalities, the record also shows that the short-term measures that the Company implemented in 2008 and 2009 have significantly reinforced the Lower SEMA system,

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and alleviated the short-term financial burdens that were being imposed in the Lower SEMA market because of out-of-market operation of Canal. In fact, the Canal units, which had been used extensively out of merit prior to the short-term transmission enhancements in Lower SEMA, were no longer being dispatched out of merit for double contingency avoidance purposes in 2010 and 2011 (Tr. 8, at 996; RR-EFSB-GEN-1(1)).

We also note that only one of the affected four municipalities has affirmatively indicated its support for a comprehensive exemption (Exh. EFSB-Z-1(S) Att. E). Had the Company secured similar expressions of support for a comprehensive zoning exemption from each of the affected municipalities, the Board may have viewed the grant of the requested comprehensive zoning exemptions differently, knowing that municipal home rule prerogatives were being shown appropriate, due deference. The Board has articulated these concerns previously and expressed its reasoning in prior decisions. See GSRP, EFSB 08-2/D.P.U. 08-105/08-106, at 136-137; National Grid Worcester, EFSB 09-1/D.P.U. 09-52/09-53, at 81-82.

While the Board has found infra that the Project is needed, and should go forward, the record does not support a finding that the Project is so acutely time-sensitive under present conditions that comprehensive zoning exemptions are necessary to prevent substantial public harm. Nor, is the Board fully satisfied that each of the municipalities affected by the requested grant of comprehensive zoning exemptions has affirmatively indicated its support for such an approval. Accordingly, NSTAR's request for a comprehensive zoning exemption is denied.

C. Decision on G.L. c. 40A, § 3

The Siting Board finds pursuant to G.L. c. 40A, § 3 that construction and operation of the Company's proposed facility is reasonably necessary for the public convenience or welfare of the public. Accordingly, subject to the mitigation set forth in this Decision, and the conditions set forth in Section X, below, and subject to the exceptions set forth in Section VII.A.6, above, the Siting Board approves the Company's petition for individual exemptions from the provisions of the Town of Carver, Town of Plymouth, and Town of Bourne Zoning Bylaws and the Town of Barnstable Zoning Ordinance as set forth in Tables 4 through 7 above. The Siting Board denies the Company's petition for comprehensive exemptions.

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VIII. ANALYSIS UNDER G.L. C. 164, § 72

A. Standard of Review

G. L. c. 164, § 72, requires, in relevant part, that an electric company seeking approval to construct a transmission line must file with the Department a petition for “authority to construct and use . . . a line for the transmission of electricity for distribution in some definite area or for supplying electricity to itself or to another electric company or to a municipal lighting plant for distribution and sale . . . and shall represent that such line will or does serve the public convenience and is consistent with the public interest. . . . The [D]epartment, after notice and a public hearing in one or more of the towns affected, may determine that said line is necessary for the purpose alleged, and will serve the public convenience and is consistent with the public interest.”<sup>55</sup>

The Department, in making a determination under G.L. c. 164, § 72, is to consider all aspects of the public interest. Boston Edison Company v. Town of Sudbury, 356 Mass. 406, 419 (1969). Section 72, for example, permits the Department to prescribe reasonable conditions for the protection of the public safety. *Id.* at 419-420. All factors affecting any phase of the public interest and public convenience must be weighed fairly by the Department in a determination under G.L. c. 164, § 72. Town of Sudbury v. Department of Public Utilities, 343 Mass. 428, 430 (1962). In evaluating petitions filed pursuant to G.L. c. 164, § 72, the Department relies on the standard of review established for G.L. c. 164, c. 40A, § 3 for determining whether the proposed Project is reasonably necessary for the convenience or welfare of the public.

B. Analysis and Decision

Based on the record in this proceeding and the above analyses in Sections III through VI, and with implementation of the specified mitigation measures proposed by the Company and conditions set forth by the Siting Board in Section X, below, the Siting Board finds pursuant to G.L. c. 164, § 72 that the proposed transmission line and ancillary substation upgrades are necessary for the purpose alleged, will serve the public convenience, and are consistent with the

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<sup>55</sup> Pursuant to G.L. c. 164, § 72, the electric company must file with its petition a general description of the transmission line, a map or plan showing its general location, an estimate showing in reasonable detail the cost of the line, and such additional maps and information as the [Siting Board] requires.

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public interest. Thus, subject to the conditions below, the Siting Board approves the Company's petition under G.L. c. 164, §72.

#### IX. SECTION 61 FINDINGS

The Massachusetts Environmental Policy Act ("MEPA") provides that "[a]ny determination made by an agency of the Commonwealth shall include a finding describing the environmental impact, if any, of the Project and a finding that all feasible measures have been taken to avoid or minimize said impact." G.L. c. 30, § 61. Pursuant to 301 C.M.R. § 11.01 (3), these findings are necessary when an Environmental Impact Report ("EIR") is submitted by a petitioner to the Secretary of Environmental Affairs, and should be based on such EIR. Where an EIR is not required, G.L. c. 30, § 61 findings are not necessary. 301 C.M.R. § 11.01 (3). The record indicates that a DEIR and FEIR were required for NSTAR's proposed transmission Project. Therefore, a finding under G.L. c. 30, § 61 is necessary for the Company's Zoning Petition and its Section 72 Petition.<sup>56</sup>

The Siting Board recognizes the Commonwealth's policies relating to greenhouse gas emissions, including G.L. c. 30, § 61 and the Executive Office of Energy and Environmental Affairs Greenhouse Gas Emission Policy and Protocol. The Siting Board notes that this proposed Project will have minimal greenhouse gas emissions as it is an overhead transmission line. As such, the Project will not have direct emissions from a stationary source or indirect emissions from energy consumption.<sup>57</sup> The Siting Board addresses indirect emissions from off-road construction vehicles and equipment and use of SF<sub>6</sub> at substations in Sections V.B and V.F.

In Sections V.B, and V.F, above, the Siting Board conducted a comprehensive analysis of the environmental impacts of the Project and found that the impacts of the Project along the Primary Route with the Oak Street Substation would be minimized and that the Project along the

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<sup>56</sup> The Siting Board is not required to make a G.L. c. 30, § 61 finding under G.L. c. 164, §69J as the Siting Board is exempt from MEPA filing requirements.

<sup>57</sup> The Secretary's Certificate on the Environmental Notification Form issued November 5, 2010 states "The Lower SEMA 345 kV Transmission Project is subject to the MEPA Greenhouse Gas Emissions and Protocol Policy because it requires an EIR. MassDEP and DOER indicate that this project will produce minimal greenhouse gas emissions. I therefore find that this project falls within the Policy's de minimus exception." (Exh. G-3 (S2)).

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Primary Route would achieve an appropriate balance among conflicting environmental concerns as well as among environmental impacts, reliability, and cost. Accordingly, the Siting Board finds that all feasible measures have been taken to avoid or minimize the environmental impacts of the proposed facilities.

X. DECISION

The Siting Board's enabling statute requires the Siting Board to implement the provisions contained in G.L. c. 164, §§ 69H to 69Q, so as 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. In addition, the statute requires that the Siting Board determine whether plans for the construction of energy facilities are consistent with current health, environmental protection, and resource use and development policies as adopted by the Commonwealth. G.L. c. 164, § 69J.

In Section III, above, the Siting Board found that additional energy resources are needed under certain contingencies to reliably serve Lower SEMA .

In Section IV, above, the Siting Board found that the Project is, on balance, preferable to alternative project approaches in terms of reliability, cost, environmental impact, and in its ability to meet the identified need.

In Section V.A, above, the Siting Board found that the Company has developed and applied a reasonable set of criteria for identifying and evaluating alternatives to the proposed project in a manner which ensures that it has not overlooked or eliminated any routes which are clearly superior to the proposed project. The Siting Board also found that the Company has identified a range of practical transmission line routes with some measure of geographic diversity. As a result, the Siting Board found that NSTAR has demonstrated that it examined a reasonable range of practical siting alternatives.

In Sections V.B, and V.F, above, the Siting Board found that the Primary Route with the Oak Street Substation is preferable to the Alternative Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. In Section V.H, the Siting Board found that with the implementation of the specified mitigation and conditions, and compliance with all local, state and federal requirements, the environmental impacts of the proposed Project would be minimized.

In Section VI, above, the Siting Board reviewed environmental impacts of the proposed

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Project in light of current health, environmental protection, and resource use and development policies as adopted by the Commonwealth. As evidenced by the findings in Section VI, the proposed Project along the Primary Route would be generally consistent with the Commonwealth's health policies, environmental protection policies, and resource use and development policies.

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

In addition, the Siting Board has found pursuant to G.L. c. 164, § 72 that NSTAR's proposed facilities are 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 L.

In addition, the Siting Board has found pursuant to G.L. c. 40A, § 3 that construction and operation of the Company's proposed facilities are reasonably necessary for the public convenience or welfare. Accordingly, the Siting Board approves NSTAR's petition for an exemption from certain provisions of the Zoning By-laws of Carver, Plymouth and Bourne, and the Zoning Ordinance of Barnstable, as enumerated in Section VII, above. The Siting Board denies the Company's petition for a comprehensive exemption from the operation of the Zoning By-laws of Carver, Plymouth and Bourne, and the Zoning Ordinance of Barnstable, as described in Section VII.

The Siting Board APPROVES the Company's Consolidated Petitions subject to the following conditions:

- A. To mitigate wetlands and water resource impacts, the Siting Board directs the Company to replace permanently altered wetlands in kind, proximate to the relevant waterbody, in an amount at least equal to the amount of the permanently altered wetlands.
- B. The Siting Board directs the Company to ensure that under its continuing vegetative management program, any application of herbicides must be consistent with utility right-of-way Integrated Vegetation Management Practices and applicable rules and regulations of the Commonwealth. The Siting Board further directs the Company to

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continue to work with the affected municipalities and the Cape Cod Commission to address concerns regarding herbicide use.

C. To mitigate noise impacts the Siting Board directs NSTAR to conduct all Project construction between the hours of 7 a.m. and 6 p.m. on weekdays only, and excluding holidays. To the extent the Company finds that construction performed outside of these hours or on weekends or holidays is necessary, the Company shall seek written permission from the relevant municipal authority prior to the commencement of such work, and provide the Siting Board with a copy of such permission. If the Company and municipal officials are not able to agree on whether weekend, holiday, or extended weekday construction should occur, the Company may request prior authorization from the Siting Board, provided that it also notifies the relevant municipal authorities in writing of such request.

D. To mitigate construction impacts, the Siting Board directs NSTAR, in consultation with the Towns of Carver, Plymouth, Bourne, and Barnstable, to develop a community outreach plan for project construction. This outreach plan should, at a minimum, set forth procedures for providing prior notification to affected residents of: (a) the scheduled start, duration, and hours of construction; (b) any construction the Company intends to conduct that, due to unusual circumstances, must take place outside of the hours detailed above; and (c) complaint and response procedures including contact information and a dedicated project hotline for complaints.

E. To minimize visual impacts, the Siting Board directs NSTAR to implement an off-site screening program to include the following requirements:

- a. upon completion of construction the Company will notify in writing by first class mail with delivery confirmation all owners of property located on or abutting the ROW of the option to request that the Company provide off-site screening. The Company will follow up with a phone call to non-responding property owners for whom a phone number is accessible. The off-site screening may include, but it not limited to, shrubs, trees, window awnings and fences, provided that the Company's operating and maintenance requirements for its ROW facilities are met;

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- b. provide property owners with a selection of generic renderings of possible mitigation approaches. Such renderings shall be for guidance purposes only, and shall not limit a property owner's ability to request different mitigation;
- c. meet with each property owner who requests mitigation to determine the type of mitigation package the Company will provide, provided that the Company has received a response from the property owner within three months of receipt of the Company's written notification;
- d. honor all property owners' requests for reasonable and feasible mitigation that are submitted within six months of a meeting with the Company and/or its consultants;
- e. provide a warranty to property owners to ensure that all plantings are established and replaced if needed at the end of one year from the date of planting, provided that the property owner reasonably maintains the plantings;
- f. submit to the Siting Board for its approval, at least three months before the conclusion of construction, a draft of the notification letter to property owners prior to mailing; and
- g. submit a compliance filing within 18 months of completion of construction detailing: (i) a list of all properties that were notified of the available off-site landscaping; (ii) the number of property owners that responded to the offer for off-site mitigation; (iii) a list of any property owners whose requests were not honored, and the rationale therefore; (iv) a general description of the types of off-site landscaping provided; and (v) the average cost of landscaping per property, broken down by installation, material, and design costs.

F. To mitigate construction impacts, the Siting Board directs NSTAR to submit for Siting Board approval a draft support site and substation/switching station plan, prior to the commencement of project construction, to be developed with input from the communities where the support sites will be located. The plan should include both a written description and map of the specific location of each support site including the boundaries of each support site, and a description of all the activities, including construction worker parking, that will occur at each site. The plan should describe:

- (a) the hours that activities will occur;
- (b) an estimate of the timeline for the use of each

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support site; (c) the duration and location of police details and/or flagmen if proposed; (d) maintenance of the support site to avoid impacts to the surrounding properties; (e) use restrictions; (f) additional mitigation as appropriate; (g) plans to return the site to its original use and condition; and (h) a description of how community input was obtained.

G. To mitigate traffic impacts, the Siting Board directs NSTAR to, in consultation with affected municipalities and Company contractors, develop and implement a traffic management plan to minimize traffic disruption, which includes, but is not limited to, the following measures: (1) signs erected to identify construction work zones; (2) police details and/or flagmen to direct traffic near public road crossings; and (3) police details and/or flagmen to direct traffic at construction work sites along roads.

H. The Siting Board directs that all diesel-powered non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of project construction must have USEPA-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies (to the extent that they are commercially available) installed on the exhaust system side of the diesel combustion engine. Prior to the commencement of construction, the Company shall submit to the Siting Board certification of compliance with this condition and a list of retrofitted equipment, including type of equipment, make/model, model year, engine horsepower, and the type of emission control technology installed.

I. The Siting Board directs the Company that all off-road construction equipment used during project construction shall use ultra-low diesel and that idling be limited to no more than five minutes whenever practicable.

J. The Siting Board directs the Company to construct the new transmission line in accordance with the following restrictions and requirements, as agreed to by the Company and Mr. LaLiberte: (1) the Company will relocate existing line 322, currently located on H-frame structures, onto new structures closer to the center of the ROW in the vicinity of Mr. LaLiberte's home, so that the new transmission line will be no closer to the edge-of-ROW than existing line 322 is today, adjacent to Mr. LaLiberte's home

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(2) to the greatest extent possible, the Company will not remove trees from the buffer which currently exists between Mr. LaLiberte's home and the transmission lines and (3) the Company will address Mr. LaLiberte's concerns with respect to noise and vibration from existing line 322.

K. The Siting Board directs the Company to develop and implement the integrated landscape plan to screen the proposed substation from Oak Street and Route 6, and to consult with the Town of Barnstable regarding the plan. The Siting Board further directs the Company to submit the landscape plan to the Board for approval prior to construction of the Oak Street Substation.

L. The Siting Board directs the Company, prior to the start of construction, to submit to the Board an updated and certified cost estimate for the Project. The Siting Board further directs NSTAR to file semi-annual compliance reports with the Siting Board and all parties, starting within 60 days of the commencement of construction, that include projected and actual construction costs, projected and actual segment completion dates, explanations for any discrepancies between projected and actual costs and completion dates, and an explanation of the Company's internal capital authorization approval process.

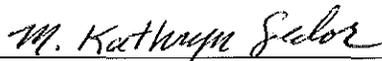
Because the issues addressed in this Decision relative to this facility are subject to change over time, construction of the proposed facility must commence within three years of the date of this Decision.

The Siting Board notes that the findings in this decision are based on the record in this case NSTAR has an absolute obligation to construct and operate its facilities in conformance with all aspects of its proposal as presented to the Siting Board. Therefore, the Siting Board requires the Company 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 is obligated to provide the Siting Board with sufficient information on changes to the proposed Project to enable the Siting Board to make these determinations.

The Secretary of the Department shall transmit a copy of this Decision and the Section 61 findings contained herein to the Secretary of the Executive Office of Energy and Environmental Affairs and the Company shall to serve a copy of this decision on the Towns of Carver,

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Plymouth, Bourne, and Barnstable; and the Boards of Selectmen of the Towns of Carver, Plymouth, and Bourne and the Town Council of the Town of Barnstable; the Planning Boards of the Towns of Carver, Plymouth, Bourne and Barnstable; the Zoning Boards of Appeals of the Towns of Carver, Plymouth, Bourne, and Barnstable, within five days of its issuance. The Company shall certify to the Secretary of the Department within ten business days of issuance that such service has been made.

  
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M. Kathryn Sedor  
Presiding Officer

Dated this 27th day of April, 2012

EFSB 10-2/D.P.U. 10-131/10-132

APPROVED by the Energy Facilities Siting Board at its meeting of April 12, 2012, by the members present and voting. Voting for approval of the Tentative Decision as amended: Steven Clarke, (Acting Energy Facilities Siting Board Chair/Designee for Richard Sullivan, Secretary, Executive Office of Energy and Environmental Affairs); Jollette A. Westbrook, Commissioner, Department of Public Utilities; Mark Sylvia (Commissioner, Department of Energy Resources); Laurel Mackay (Designee for Commissioner, Department of Environmental Protection); Victoria Maguire (Designee for Secretary, Executive Office of Housing and Economic Development); Kevin Galligan, Public Member; Dan Kuhs, Public Member; and Penn Loh, Public Member.



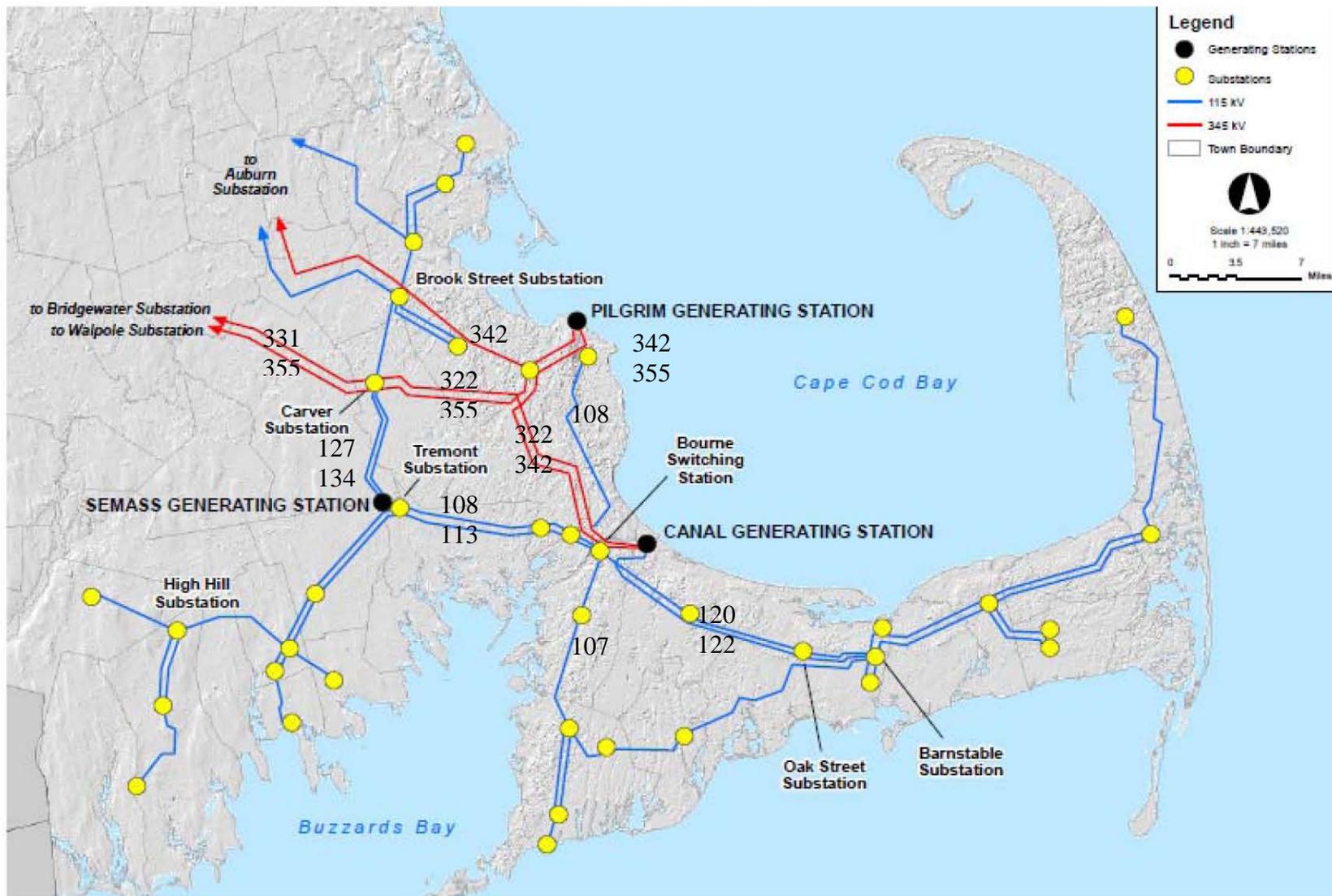
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Steven Clarke, Acting Chair  
Energy Facilities Siting Board

Dated this 27 day of April, 2012

EFSB 10-2/D.P.U. 10-131/10-132

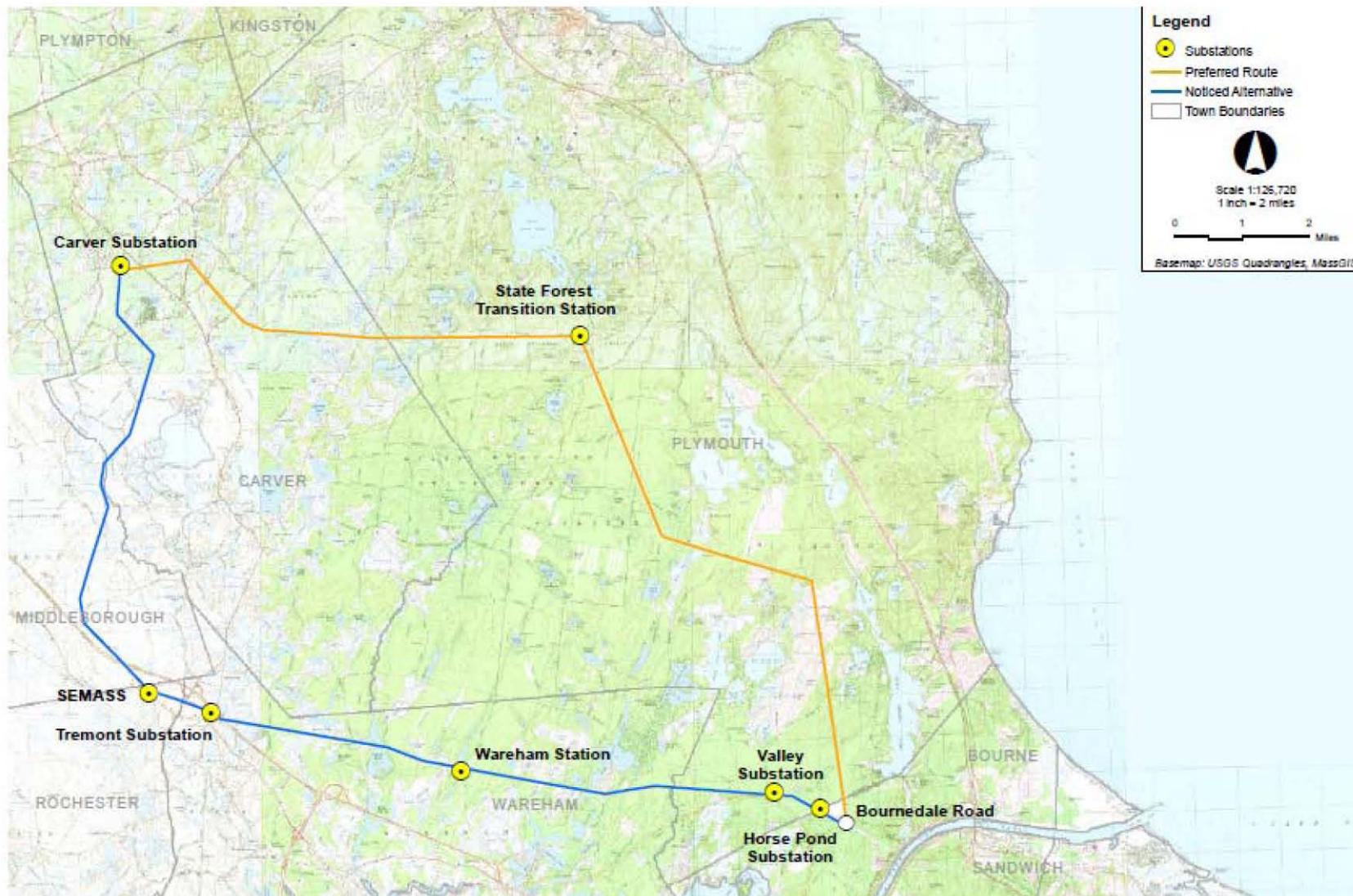
Figure 1. Transmission System Map of Lower SEMA



Exh. EFSB-G-1.

EFSB 10-2/D.P.U. 10-131/10-132

Figure 2. Primary and Alternative Routes from Carver Substation to Bournedale Road



Exh. NSTAR-1, at Fig. 1-5

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

COMMONWEALTH OF MASSACHUSETTS  
Energy Facilities Siting Board

\_\_\_\_\_  
The University of Massachusetts )  
at Amherst )  
Advisory Ruling )  
\_\_\_\_\_ )

August 20, 2012

ADVISORY RULING  
ADOPTED BY ACTION BY CONSENT

The Energy Facilities Siting Board (“Siting Board”) issues this Advisory Ruling using the “Action by Consent” process described and authorized by 980 CMR § 2.07, because the Siting Board finds that expeditious action is necessary. See 980 CMR § 2.07(1).

By letter dated April 26, 2012, the consulting firm of Woodard & Curran, Inc. (“Woodard”), acting on behalf of its client the University of Massachusetts at Amherst (“UMASS”), petitioned the Energy Facilities Siting Board (“Siting Board” or “Board”) for an advisory ruling pursuant to the provisions of 980 CMR 2.08 and G.L. c. 30A, § 8 (the “Request”), concerning the Board’s jurisdiction over the siting and construction of a temporary liquefied natural gas (LNG) storage facility (the “Project”) to be located at UMASS’s Campus Heating Plant (“CHP”).<sup>1</sup> UMASS personnel, a Woodard representative (UMASS and Woodard are jointly referred to as the “Petitioners”) and other consultants met with Siting Board staff on May 18, 2012, to answer questions and to more fully explain the Project. On June 25, 2012, the Siting Board, through an Action by Consent, voted unanimously to issue an advisory ruling as requested.

I. DESCRIPTION OF THE PROPOSED PROJECT

A. Need for the Project

The CHP facility is a cogeneration system designed to produce steam for central heating and 16.5 MW of electricity for campus use. The CHP facility is a flexible dual-fuel unit that can burn either natural gas, ultra-low-sulfur distillate (“ULSD”), or combinations of both at the same

<sup>1</sup> UMASS uses the term Campus Heating Plant (“CHP”) to refer to what is a combined heat and power plant.

time. The plant receives interruptible natural gas from Berkshire Gas Company via its distribution system. Given the limited capacity of the Berkshire Gas system, gas deliveries to the CHIP unit begin to be curtailed when temperatures go below 34°F and are completely cut off when temperatures drop to 14°F. During gas curtailments, UMASS must switch to ULSD, which is much more costly and requires operators to shut off the exclusively gas-fired duct-firing unit attached to the main turbine. This action reduces both the electrical output and the supply of steam for campus heating. The frequent winter gas supply interruptions reduce the efficiency of the CHP facility and increase its operating costs. For these reasons, UMASS proposes to test the viability and economics of using LNG as a backup fuel for its CHP unit over the next two winters (2012-13 and 2013-14). UMASS estimates that LNG use would save \$1.5 million to \$2 million per year in fuel costs. UMASS indicates that some use of ULSD would still be necessary during the winter, although it hopes to reduce the volume of ULSD as much as possible.

B. Project Alternatives

UMASS is currently considering two alternatives for providing backup LNG supplies at its CHP plant. One alternative would involve placing two skid-mounted 15,000-gallon LNG storage tanks with a skid-mounted vaporization unit next to the plant (which would result in a total storage capacity of up to 30,000 gallons). The other alternative would involve dedicating parking spaces for two LNG tankers with average capacities ranging from 10,000 to 13,000 gallons (which would result in a total storage capacity of up to 26,000 gallons).<sup>2</sup> UMASS indicated that LNG would be trucked to the campus from the Distrigas facility in Everett (or other possible suppliers), with deliveries of one to three tankers daily during the winter when natural gas service is interrupted. UMASS personnel indicated that they would make their selection between the two options based on cost.

Furthermore, UMASS stated that it would ideally like to request bids from contractors during July 2012. This short timetable creates the need for expeditious action that requires the Board to use the action by consent procedure.

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<sup>2</sup> UMASS represented that during the swap out of an empty LNG tank, an LNG delivery truck holding a third tank would also be on site for a brief period of time. The Board believes that, given the brief presence of the third tanker truck during tank swap outs, its transient capacity would not be regarded as "storage."

## II. LEGAL ISSUES: SITING BOARD JURISDICTION

The Board has jurisdiction over all “facilities” as that word is defined in G.L. c. 164, § 69G. Pursuant to this jurisdiction, the Board must approve a petition for construction of any facility, pursuant to G.L. c. 164, § 69J, before it may be built. For purposes of the present matter, the relevant type of facility is: “a unit, including associated buildings and structures, designed for or capable of the manufacture or storage of gas<sup>3</sup>, **except such units below a minimum threshold size as established by regulation.**” G.L. c. 164, § 69G (emphasis and footnote added). Pursuant to this express statutory authority, the Siting Board has adopted a regulation providing for exemptions of certain gas storage facilities from Board jurisdiction. 980 CMR 1.01(4)(e).

The regulation at 980 CMR 1.01(4)(e) establishes three exemptions from EFSB jurisdiction: subsection (e)(1) exempts gas storage facilities with a capacity of less than of 25,000 gallons; subsection (e)(2) exempts units that store gas “whose primary purpose is research, development, or demonstration of technology”; and subsection (e)(3) exempts landfills and sewage treatment plants. Prior to promulgation of these exemptions, the regulatory definition of “facilities” did not establish a minimum size exception as authorized by the Siting Board statute and, therefore, all natural gas storage facilities were subject to review without regard to size.

At the meeting with Board staff, UMASS personnel asserted that the exemption for units with less than 25,000 gallons in storage capacity, 980 CMR 1.01(4)(e)(1), might apply even if UMASS pursues the option of installing two 15,000 gallon tanks on skids. Specifically, UMASS offered to limit its total storage of LNG to less than 25,000 gallons, even though the capacity of the storage units would be greater than 25,000 gallons.

UMASS personnel also asked that the Board consider a second possible exemption: the one for research, development, or demonstration of technology set forth at 980 CMR 1.01(4)(e)(2). The UMASS representatives indicated that the CHP unit would be the first such combined heat and power unit in Massachusetts to use LNG to supplement natural gas obtained by pipeline. Also, the project would be in place for only two years, which is consistent with the

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<sup>3</sup> In this statute, “gas” is defined to include “natural gas, propane air, synthetic natural gas, and liquefied natural gas.” G.L. c. 164, § 69G.

idea of testing or demonstrating a new technology. If the new technology is successful and offers cost savings, then UMASS intends to consider constructing permanent LNG tanks.

### III. ANALYSIS

#### A. Advantages of Using Natural Gas

LNG applications appear to be of increasing market interest given that natural gas currently offers cost savings (relative to distillate fuel oil, diesel, gasoline, and propane), reduced emissions of greenhouse gases and other pollutants, and greater operational flexibility – all of which are illustrated in the UMASS proposal. Furthermore, greater use of LNG as a substitute for oil-based products would help support a number of energy and environmental policies of the Commonwealth, including reduced greenhouse gas emissions (Global Warming Solutions Act), increased use of combined heat and power (Green Communities Act's adoption of an Alternative Portfolio Standard), and the Siting Board's statutory objective of ensuring a reliable supply of energy, at least possible cost, with a minimum impact to the environment.

Currently, the CHP unit has two sources of fuel: natural gas provided by Berkshire Gas Company and ULSD, stored on site. With the addition of the proposed LNG storage facility, the CHP unit will have a third source of fuel, while fully retaining the existing ULSD storage capacity—its current backup fuel. Consequently, construction of the LNG storage facility will increase both the fuel diversity and reliability of the CHP unit.

Despite these benefits, however, the Board cannot advise the Petitioners that the Project would be non-jurisdictional unless it has a reason for doing so that meets its statutory and regulatory requirements. Consequently, we first examine the grounds asserted by UMASS.

#### B. The Regulatory Exemptions from EFSB Jurisdiction

##### 1. The Grounds for Exemptions Asserted by UMASS

The storage capacity of the Project would be either 26,000 gallons, if UMASS dedicates two parking spaces to LNG tanks hauled and stored on trailers,<sup>4</sup> or 30,000 gallons, if a skid-mounted LNG storage facility is constructed. In either case, the storage capacity would exceed

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<sup>4</sup> While LNG tanks hauled and stored on trailers vary in size, the Board has been informed that the storage capacity of these tanks do not to exceed 13,000 gallons each. Therefore, if two of the largest-sized tanks were parked together, they would have a combined storage capacity of 26,000 gallons.

25,000 gallons. Therefore, the Project would not qualify for the exemption for natural gas storage facilities that have fewer than 25,000 gallons in storage capacity. UMASS's willingness to limit its actual storage of LNG to 25,000 gallons does not affect the capacity of the Project with respect to the applicability of 980 CMR 1.01(4)(e).

Furthermore, the information provided to the Board by Woodard and UMASS does not convince the Board that the Project would qualify for the exemption for research, development, or demonstration of technology as its primary purpose. To the contrary, Woodard indicated that the use of LNG at end-use installations is not unusual in New England and that LNG technology is proven and safe. The key rationale for the Project is that it would reduce operating costs and produce environmental benefits.

2. 980 CMR 1.02(1) Exemption

Another option available to the Board that would preclude the need for jurisdictional review of the Project, pursuant to 980 CMR 1.02(1), was not identified by the Petitioners. 980 CMR 1.02(1) provides that: "Where good cause appears, not contrary to statute, the Board and any Presiding Officer may permit deviation from any rules contained in 980 CMR." Consequently, the Board may issue a ruling in which it allows UMASS to deviate from the 25,000-gallon threshold so long as it makes two findings. The first finding is that there is "good cause" to permit the deviation. The second finding is that granting the deviation would not be contrary to the relevant statute, which, in this case, would be G.L. c. 164, § 69G.

a. Petitioners Have Shown Good Cause to Permit Deviation.

The "good cause shown" that would allow a deviation from the 25,000-gallon jurisdictional threshold for a gas storage facility includes the following:

- Regulatory intent as expressed by the Board when it established the minimum size exemption was to retain jurisdiction over utility-scale natural gas facilities but to exempt non-utility storage facilities. Rulemaking to Amend 980 CMR 1.01(4)(e), at 3 (EFSB 2011).

- The Project's gas storage capacity would be close to the jurisdictional threshold, as established by EFSB regulation, and would be a non-utility facility.
- The Project would be temporary in nature.
- The Project would further recently established environmental and energy efficiency policies of the Commonwealth.
- The Project would comply with all federal, state and local safety requirements and obtain all necessary permits and licenses.

The Project would be beneficial to UMASS, its students and faculty, and the taxpayers of the Commonwealth. The Board finds that all of these factors, taken together, constitute "good cause" to permit UMASS to deviate from the requirement that proposed facilities with a storage capacity in excess of 25,000 gallons and not otherwise exempted be submitted to the Board for approval pursuant to G.L. c. 164, § 69J.

b. Granting The Deviation Would Not Be Contrary to Statute

As noted above, the Siting Board has statutory authority to exempt from Board approval facilities "below a minimum size threshold as established by regulation." G.L. c. 164, §69 G. The Board has done so, setting that threshold at 25,000 gallons, in pertinent part. 980 CMR 1.01(4)(e)(1).

Several considerations cause us to conclude that waiving the 25,000 gallon threshold in this case would not be contrary to statute:

- The legislature delegated to the Board the authority to set a minimum size exemption.
- As noted, the Board's intent when it established the minimum size exemption was to exempt non-utility-scale storage facilities.
- The proposed facility is neither utility scale nor significantly larger than the 25,000 gallon threshold.
- The Board has explicit authority to waive its regulations.

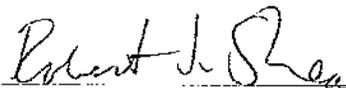
IV. ADVISORY RULING

Accordingly, after due consideration of the facts and arguments presented by UMASS, as well as our own analysis, the Siting Board hereby advises that, pursuant to 980 CMR 1.02(1), there is good cause to deviate from the 25,000-gallon threshold in 980 CMR 1.01(4)(e) in this

matter and that such a deviation would not be contrary to statute. Therefore, the Siting Board further advises UMASS that it may construct a temporary (through the end of the 2013/2014 heating season) LNG storage facility at its CHP location, of a size not to exceed 30,000 gallons in total storage capacity without seeking approval from the Siting Board.

Two caveats are in order. First, we note that, as set forth in 980 CMR 2.08, “[n]o advisory ruling shall bind or otherwise estop the Board in any pending or future matter.” If an entity seeks a binding decision of the jurisdictional issue raised by this proceeding, the entity may either file a petition to construct and raise the issue in the context of that proceeding or may seek a determination of Siting Board jurisdiction pursuant to 980 CMR 2.09.

Second, in rendering the requested Advisory Ruling, the Siting Board assumes, but does not expressly find, that all material facts have been stated and that the facts are as represented by Woodard and UMASS in the Request and in the meeting with Siting Board staff on May 18, 2012. Should the material facts presented by Woodard or UMASS change or be inaccurate, this Advisory Ruling may not be applicable.



Robert J. Shea  
Presiding Officer

This Advisory Ruling adopted by Action by Consent may be executed in any number of counterparts, each of which shall be an original, but all of which constitute one agreement, and shall be dated and become effective when the copies bearing all of the signatures of the Siting Board members are received by the Acting Chair. 980 CMR § 2.06(2).

Signed:

  
\_\_\_\_\_

Steven Clarke  
Acting Energy Facilities Siting Board Chair  
For Secretary, Executive Office of  
Energy and Environmental Affairs

8/11/12  
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Date

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Ann G. Berwick  
Chair  
Department of Public Utilities

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Date

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Jollette A. Westbrook  
Commissioner  
Department of Public Utilities

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Date

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Mark Sylvia  
Commissioner, Department of Energy Resources

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Date

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Victoria Maguire, Designee  
For Secretary, Executive Office of Housing  
and Economic Development

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Nancy Kaplan, Designee  
For Commissioner, Department of Environmental Protection

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Penn Loh, Public Member

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Date

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Kevin Galligan, Public Member

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Date

Signed:

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Steven Clarke  
Acting Energy Facilities Siting Board Chair  
For Secretary, Executive Office of  
Energy and Environmental Affairs

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Date

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*Ann G. Berwick*  
Ann G. Berwick  
Chair  
Department of Public Utilities

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*8/20/12*  
Date

\_\_\_\_\_  
Jolette A. Westbrook  
Commissioner  
Department of Public Utilities

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Date

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Mark Sylvia  
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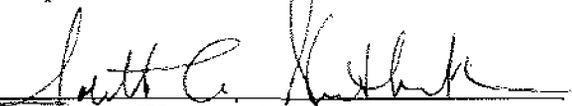
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Steven Clarke  
Acting Energy Facilities Siting Board Chair  
For Secretary, Executive Office of  
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Ann G. Berwick  
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Jollette A. Westbrook  
Commissioner  
Department of Public Utilities

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Date

*August 10, 2012*

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Mark Sylvia  
Commissioner, Department of Energy Resources

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Date

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Victoria Maguire, Designee  
For Secretary, Executive Office of Housing  
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Kevin Galligan, Public Member

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Advisory Ruling  
The University of Massachusetts at Amherst

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Signed:

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Steven Clarke  
Acting Energy Facilities Siting Board Chair  
For Secretary, Executive Office of  
Energy and Environmental Affairs

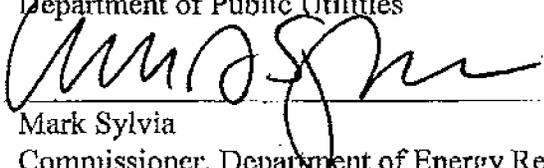
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Mark Sylvia  
Commissioner, Department of Energy Resources

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8/7/2012  
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Victoria Maguire, Designee  
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Signed:

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Steven Clarke  
Acting Energy Facilities Siting Board Chair  
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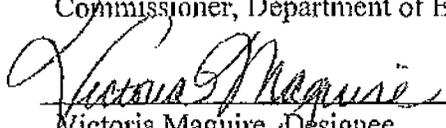
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Mark Sylvia  
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Victoria Maguire, Designee  
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Kevin Galligan, Public Member

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Advisory Ruling  
The University of Massachusetts at Amherst

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Signed:

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For Secretary, Executive Office of  
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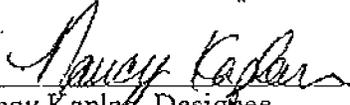
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For Commissioner, Department of Environmental Protection

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Penn Loh, Public Member

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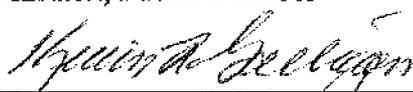
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Kevin Galligan, Public Member

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Dan Kuhs, Public Member

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Date

9-31-2012

**COMMONWEALTH OF MASSACHUSETTS  
ENERGY FACILITIES SITING BOARD**

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In the Matter of the Petition of Footprint Power  
Salem Harbor Development LP for Approval to  
Construct a Bulk Generating Facility in the City  
of Salem, Massachusetts

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EFSB 12-2

**FINAL DECISION**

Robert J. Shea  
Presiding Officer

October 10, 2013

On the Decision:

Margaret Howard  
Barbara Shapiro  
John Young

APPEARANCES:

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Harbor Development LP  
Petitioner

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Intervenor

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Intervenor

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Intervenor

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Intervenor

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ABBREVIATIONS

|                                |  |
|--------------------------------|--|
| 1998 Viability Order           | <u>Notice of Inquiry with Regard to the Siting Board’s Standard of Review for Generating Facility Viability, 7 DOMSB 19 (1998)</u>   |
| ACCs                           | air cooled condensers  |
| Algonquin                      | Algonquin Gas Transmission, LLC, a subsidiary of Spectra Energy  |
| ALOHA                          | Areal Locations of Hazardous Atmospheres   |
| AUL                            | Activity and Use Limitation(s)   |
| BACT                           | Best Available Control Technology  |
| <u>Braintree Decision</u>      | <u>Braintree Electric Light Department, 16 DOMSB 78 (2008)</u>   |
| <u>Brockton Decision 2000</u>  | <u>Brockton Power LLC, 10 DOMSB 157 (2000)</u>   |
| <u>Brockton Power Decision</u> | <u>Brockton Power Company LLC, 17 DOMSB 157 (2009)</u>   |
| Btus                           | British thermal units  |
| CACI                           | Clean Air Construction Initiative  |
| CAIR                           | Clean Air Interstate Rule  |
| CBA                            | Community Benefits Agreement   |
| CELT                           | Capacity, Energy, Loads, and Transmission  |
| City                           | City of Salem  |
| CLF                            | Conservation Law Foundation  |
| CO                             | carbon monoxide  |
| CO <sub>2</sub>                | carbon dioxide   |
| Company                        | The entire “Footprint Power” group of companies, partnerships, and other entities registered with the Secretary of the Commonwealth. |
| CRA                            | Charles River Associates   |
| dBA                            | A-weighted decibels  |
| DOER                           | Massachusetts Department of Energy Resources   |

|                      |  |
|----------------------|--|
| Dominion Resources   | Dominion Resources, Inc.   |
| DOMSB                | Decisions and Orders of Massachusetts Energy Facilities Siting Board   |
| Doukas Affidavit     | Affidavit of Karla J. Doukas dated September 18, 2012, submitted with the Return of Service  |
| DPA                  | Designated Port Area   |
| EFSB                 | Energy Facilities Siting Board   |
| EIA                  | United States Energy Information Administration  |
| EJ                   | Environmental Justice  |
| EMF                  | electric and magnetic field(s)   |
| EOEA                 | Executive Office of Environmental Affairs  |
| EOEEA                | Executive Office of Energy and Environmental Affairs   |
| EPC                  | Engineering, Procurement and Construction  |
| ERPG-1               | American Industrial Hygiene Association's Level 1 Emergency Response Planning Guideline  |
| FEMA                 | Federal Emergency Management Agency  |
| FERC                 | Federal Energy Regulatory Commission   |
| Footprint            | The entire "Footprint Power" group of companies, partnerships, and other entities registered with the Secretary of the Commonwealth. |
| G.L. c.              | Massachusetts General Laws chapter   |
| GEP                  | Good Engineering Practice  |
| GHG                  | greenhouse gases   |
| gpd                  | gallons per day  |
| <u>GSRP Decision</u> | <u>Western Massachusetts Electric Company, EFSB 08-2/D.P.U. 08-105/08-106 (2010)</u>   |
| GTG                  | natural gas turbine generators   |

|                                |  |
|--------------------------------|--|
| GWSA                           | Global Warming Solutions Act, St. 2008, c. 298   |
| <u>Hampden County Decision</u> | <u>New England Power Company/Western Massachusetts Power Company</u> , EFSB 10-1/D.P.U. 10-107/10-108 (2012) |
| HAPs                           | Hazardous Air Pollutants   |
| HDSNA/PNA                      | Historic Derby Street Neighborhood Association/Point Neighborhood Association                                |
| HRSG                           | heat recovery steam generators   |
| IBEW                           | International Brotherhood of Electrical Workers  |
| ISO-NE                         | ISO-New England  |
| kV                             | kilovolt   |
| kWh                            | kilowatt-hour  |
| L <sub>90</sub>                | sound level exceeded 90 percent of time  |
| L <sub>eq</sub>                | energy-averaged sound level that occurs over a given period of time  |
| L <sub>max</sub>               | maximum instantaneous sound level  |
| LAER                           | Lowest Achievable Emission Rate  |
| lbs/MWh                        | pounds per megawatt-hour   |
| lbs/MMBtu                      | pounds per million British thermal units   |
| lbs/MWh                        | pounds per megawatt-hour   |
| LNG                            | liquefied natural gas  |
| LOS                            | Level of Service (traffic grade at an intersection)  |
| LSCSF                          | Land Subject to Coastal Storm Flowage  |
| <u>Lower SEMA Decision</u>     | <u>NSTAR Electric Company</u> , EFSB 10-2/D.P.U. 10-31/10-32 (2012)  |
| M&NE                           | Maritimes and Northeast  |
| MAAQS                          | Massachusetts Ambient Air Quality Standards  |
| MADPH                          | Massachusetts Department of Public Health  |

|                                  |  |
|----------------------------------|--|
| main building                    | main power plant building  |
| MassDEP                          | Massachusetts Department of Environmental Protection                       |
| MassDOT                          | Massachusetts Department of Transportation                                 |
| MCP                              | Massachusetts Contingency Plan, 310 C.M.R. § 40.00 <u>et seq.</u>          |
| MDRP                             | Massachusetts Diesel Retrofit Program                                      |
| MEPA                             | Massachusetts Environmental Policy Act                                     |
| $\mu\text{g}/\text{m}^3$         | micrograms per cubic meter   |
| mG                               | milligauss   |
| MMBtu                            | million British thermal units  |
| <u>Montgomery Power Decision</u> | <u>Montgomery Energy Billerica Power Partners LP</u> , 16 DOMSB 317 (2009) |
| MW                               | megawatts  |
| MWh                              | megawatt-hours   |
| NAAQS                            | National Ambient Air Quality Standards                                     |
| National Grid                    | New England Power d/b/a National Grid                                      |
| NEMA/Boston                      | Northeast Massachusetts (load zone)  |
| <u>Nickel Hill Decision</u>      | <u>Nickel Hill Energy LLC</u> , 11 DOMSB 83 (2000)                         |
| NO <sub>2</sub>                  | nitrogen dioxide   |
| NOAA                             | National Oceanic and Atmospheric Administration                            |
| Notice                           | Notice of Public Hearing/Notice of Adjudication                            |
| NO <sub>x</sub>                  | nitrogen oxides  |
| NSPS                             | New Source Performance Standards   |
| NSR                              | New Source Review  |
| NSTMA                            | North Shore Transportation Management Association                          |
| parcel                           | 65-acre parcel at Salem Harbor   |

|   |   |
|---|---|
| PCBs                                    | polychlorinated biphenyls                                 |
| PM <sub>2.5</sub>                       | particulates 2.5 microns or smaller                       |
| PM <sub>10</sub>                        | particulates 10 microns or smaller                        |
| PNA                                     | Point Neighborhood Association                            |
| ppm                                     | parts per million   |
| PSD                                     | Prevention of Significant Deterioration                   |
| <u>PVEC Decision</u>                    | <u>Pioneer Valley Energy Center</u> , 17 DOMSB 294 (2009) |
| PUD                                     | Planned Unit Development                                  |
| RGGI                                    | Regional Greenhouse Gas Initiative                        |
| RPS                                     | Renewable Portfolio Standard                              |
| RTNs                                    | Release Tracking Numbers                                  |
| SAFE                                    | Salem Alliance for the Environment                        |
| Salem DPW                               | City of Salem Department of Public Works                  |
| SESD                                    | South Essex Sewerage District                             |
| SF <sub>6</sub>                         | sulfur hexafluoride                                       |
| SILs                                    | Significant Impact Levels                                 |
| <u>Sithe Edgar Decision</u>             | <u>Sithe Edgar Development, LLC</u> , 10 DOMSB 1 (2000)   |
| <u>Sithe Mystic Decision</u>            | <u>Sithe Mystic Development, LLC</u> , 9 DOMSB 101 (1999) |
| Siting Board                            | Energy Facilities Siting Board                            |
| <u>Southern Energy Kendall Decision</u> | <u>Southern Energy Kendall</u> , 11 DOMSB 255 (2000)      |
| SO <sub>2</sub>                         | sulfur dioxide  |
| SPCC                                    | Spill Prevention, Control and Countermeasure Plan         |
| stakeholder group                       | City of Salem's Power Plant Redevelopment Advisory Group  |
| STG                                     | steam turbine generators                                  |

|                           |  |
|---------------------------|--|
| SWPPP                     | Stormwater Pollution Prevention Plan                                   |
| TPS                       | Technology Performance Standards                                       |
| tpy                       | tons per year  |
| USEPA                     | U.S. Environmental Protection Agency                                   |
| VOCs                      | volatile organic compounds   |
| <u>Worcester Decision</u> | <u>New England Power Company</u> , EFSB 09-1/D.P.U. 09-52/09-53 (2011) |
| WSB                       | Salem and Beverly Water Supply Board                                   |
| ZBA                       | Salem Zoning Board of Appeals  |

Pursuant to G.L. c. 164, § 69J¼, the Massachusetts Energy Facilities Siting Board (“Siting Board”) hereby APPROVES, subject to the conditions set forth below, the petition (“Petition”) of Footprint Power Salem Harbor Development LP (“Footprint” or “Company”) to construct a 630 megawatt (“MW”) natural gas-fired, quick-start, combined-cycle facility at the present location of the Salem Harbor Station in Salem, Massachusetts.

## I. INTRODUCTION

### A. Description of the Proposed Facility, Site, and Interconnections

Footprint’s proposed facility would be a dual-unit configuration, consisting of two quick-start natural gas turbine generators (“GTG”), two heat recovery steam generators (“HRSG”), two steam turbine generators (“STG”), and it would employ air-cooled condensers (“ACCs”) for cooling (Exh. SHR-1, at 2, 31).<sup>1</sup> The facility would be capable of generating 630 MW without duct firing; with duct firing under summer conditions, it would produce an additional 62 MW for a total of 692 MW (*id.* at 1).

With a heat rate of approximately 6,000 British thermal units (“Btus”) of gas per kilowatt-hour (“kWh”) of electricity generated, the Company asserts that the proposed facility would be among the most efficient large gas-fired generating facilities in New England (*id.* at 15; Exh. EFSB-A-11). The Company anticipates that the proposed facility would operate at an approximate 80 percent capacity factor in its first several years, much like a baseload power plant (RR-EFSB-6). With its quick-start capabilities, the facility would be able to produce approximately 300 MW of output within ten minutes of startup and reach full capacity within one hour (Exh. SHR-1, at 3; Tr. 2, at 417).

The proposed facility would be constructed on a 65-acre parcel (“parcel”) that is presently occupied by four separate electric generating units (Exh. SHR-1, at 1). The site has been used for electric power generation since 1951 and two of the four units are still in operation

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<sup>1</sup> Footprint testified that its petition was based on selecting either one of two similar F-class Turbines: the GE 7FA.05 or the Siemens 5000F(5). In early May, the Company selected the GE technology (Exh. EFSB-G-4-S; Company Reply Brief at 5).

(id.). On August 3, 2012, Footprint Power Acquisitions LLC<sup>2</sup> acquired Dominion Energy Salem Harbor, LLC (now Footprint Power Salem Harbor Operations). In connection with such acquisition, Footprint Power Salem Harbor Real Estate LP owns the parcel and the existing generating units and related facilities.

A subsidiary of Dominion Resources, Inc. (“Dominion Resources”) previously operated the existing facility (Exh. SHR-1, at 1). Dominion Resources removed Units 1 and 2 (both coal-fired) from service in December 2011 (id.). Footprint has committed to shutting down Unit 3 (coal-fired) and Unit 4 (oil-fired) on June 1, 2014,<sup>3</sup> and then demolishing the existing four units and related structures, and remediating the entire 65-acre parcel (id. at 1, 105-106, 123-134). Demolition of unneeded station components would begin in early 2014, and construction of the proposed facility would begin in June 2014 with completion by the end of May 2016 (id. at 38 and Fig. 1.9.1-2). The proposed facility is scheduled to commence commercial operation in June 2016 (id. at 1).<sup>4</sup> The New England Power d/b/a National Grid (“National Grid”) substation that is currently in use at the site will remain in active operation after completion of the project (id. at 1, n. 2). The project development process includes a detailed environmental assessment and remediation of any contaminants pursuant to G.L. c. 21E and the Massachusetts Contingency

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<sup>2</sup> There are 10 separate, but related, entities using some form of the “Footprint Power” name registered with the Secretary of the Commonwealth (<http://corp.sec.state.ma.us/corp/corptest/CorpSearchInput.asp>). The use herein of “Footprint” or “Company” is intended to reference the entire “Footprint Power” group of companies, partnerships, and related entities.

<sup>3</sup> In February 2011, Dominion Resources submitted non-price retirement bids for all four Salem Harbor units, effective June 1, 2014 (FERC Docket No. ER10-2477-001, ISO-New England (“ISO-NE”) filing at March 11, 2011). ISO-NE accepted the non-price retirements of Salem Harbor units 1 and 2, but rejected the non-price retirements of units 3 and 4 (id.). On May 11, 2011, Dominion Resources informed ISO-NE that it had elected to retire all four units as of June 1, 2014. Pursuant to ISO-NE’s tariff, ISO-NE could not prevent the retirement of the units (ISO-NE Tariff, Section III.13.2.5.2.5).

<sup>4</sup> Footprint successfully bid 674 MW of capacity in the Forward Capacity Auction Number 7, which was held on February 4 and 5, 2013, by ISO-NE. Consequently, Footprint is obligated to be available to produce electricity for the 2016/2017 capacity year, which begins on June 1, 2016.

Plan (“MCP”) (Exh. SHR-11, at 1-1). The Company has committed to remediating the entire parcel, except for the National Grid substation (Tr. 5, at 927; RR-EFSB-35).

The proposed facility would be constructed on approximately a 20-acre portion of the parcel (Exh. SHR-7, at 1-2). Attachments 1, 2, and 3 to this Decision depict the site and the surrounding area (Exh. SHR-11, at Figures 1-2, 1-4, and 1-5).

A landscaped berm, which would enclose three sides of the proposed facility, is incorporated into the project design (Exh. SHR-17, at 2; see Attachment 3).<sup>5</sup> On the western and southern sides of the facility, the berm would rise to 25 feet above grade and would provide a landscaped buffer and acoustic barrier between the street and the facility (Exh. SHR-17, at 2; see Attachment 3). On the eastern edge, the berm would have a height of 15 feet and would provide a visual buffer from the harbor side (Exh. SHR-17, at 2; see Attachment 3).

The parcel is located on a peninsula that lies between Salem Harbor and Beverly Harbor and is situated next to a densely populated area in the northeastern section of Salem (Exh. SHR-1, at 128; see Attachment 1). The parcel is close to a number of National Historic Districts and National Historic Landmarks, and almost the entire site is located within the Salem Harbor Designated Port Area (“DPA”) (Exh. SHR-1, at 14 and Figure 4.9.8-1).

To the north,<sup>6</sup> the parcel borders the South Essex Sewerage District (“SESD”) wastewater treatment plant (id. at 13; see Attachment 1). Northeast of the parcel lies Cat Cove, an inlet of Salem Harbor, and to the east and northeast of Cat Cove lies Winter Island (Exh. SHR-1, at Figure 1.5-2). Winter Island, which is designated as a National Historic District, includes both the Winter Island recreational area and Fort Pickering, a National Historic Landmark (Exh. SHR-1, at 143 and Figure 4.9.8-1). The Salem Willows neighborhood, which is also designated as a National Historic District, is also located to the north of the parcel beyond the

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<sup>5</sup> Exhibit SHR-17 consists of the FEIR certificate as well as written comments on the FEIR. All page numbers in citations to Exhibit SHR-17 refer to pages of the FEIR certificate itself unless noted otherwise.

<sup>6</sup> Throughout the Petition, the Company used the term “north” to describe “project north.” Project north follows the alignment of the proposed buildings and is approximately north-northeast and parallel to the waterfront. All other compass directions are also rotated correspondingly. The Siting Board adopts this convention.

SESD wastewater treatment plant (id. at Figure 4.9.8-1). Salem Harbor lies east of the parcel (id. at 14; see Attachment 1).

The ferry terminal at Blaney Street (a.k.a. the “Salem Ferry Terminal”) and some mixed-use buildings are located to the immediate south of the parcel (see Attachment 1). The House of the Seven Gables, a National Historic Landmark, is located approximately 600 feet to the south of the parcel, and the Derby Street Wharf is located approximately 1,200 feet from the parcel’s southern boundary (Exh. SHR-1, at Figures 4.9.8-1, see Attachment 1).

Derby Street and Fort Avenue border the parcel to the west (Exh. SHR-1, at 14 and Figure 1.5-2; see Attachment 1). Residential areas and the Bentley Elementary School are located across Derby Street and Fort Avenue (Exh. SHR-1, at 14 and Figure 1.5-2; see Attachment 1). The closest residential areas are located to the west of the site, along Fort Avenue, Derby Street, and Webb Street (Exh. SHR-1, at 2; see Attachment 1). The nearest residences are located: (1) 120 feet from the closest building to be constructed (the Administration Building), (2) 50 feet from the facility site boundary, and (3) 100 feet from construction worker parking (Exhs. EFSB-LU-13; EFSB-NO-20; RR-EFSB-53). The Bentley School is located approximately 500 feet from the Footprint property line (Exhs. EFSB-L-13; RR-EFSB-53).

The proposed facility would interconnect with the grid at the existing National Grid substation located on the site (Exh. SHR-1, at 3). To interconnect, Footprint would construct 115 kilovolt (“kV”) underground cable connections from each of the four generator step-up transformers to a new facility switchyard. Two 700-foot long underground 115 kV transmission lines would connect the new facility switchyard and the National Grid substation (id. at 3-4 and Figure 1.1-1).

Algonquin Gas Transmission, LLC (“Algonquin”), a subsidiary of Spectra Energy, is expected to propose constructing, owning and operating a natural gas pipeline that would connect the Footprint facility to Algonquin’s HubLine gas pipeline at its interconnection with the Maritimes & Northeast (“M&NE”) Pipeline, located offshore from the Town of Beverly (Exhs. SHR-7, at 3-22; EFSB-G-16). The gas pipeline would be subject to Federal Energy Regulatory Commission (“FERC”) jurisdiction (Exh. SHR-11, at 2-2). The Company has provided a number of preliminary options for the pipeline route based on initial discussions with Spectra Energy (Exh. SHR-11, at 2-2 to 2-5).

The proposed facility is designed to operate using only pipeline natural gas, with no provision for on-site backup fuel sources such as fuel oil or liquefied natural gas (“LNG”).<sup>7</sup> During the proceedings and in responses to record requests, the Company articulated its reasons for designing the facility without back-up fuel storage capability.<sup>8</sup> First, the Company asserted that the local community is strongly opposed to any type of on-site fuel storage, whether that fuel were oil or LNG (Tr. 2, at 316, 318). Second, for reasons set forth in detail below, Footprint expects no gas curtailment on the M&NE system. Therefore, the Company contends that the addition of a backup fuel supply would not provide the proposed facility with any additional reliability benefits (Tr. 2, at 393-394). Furthermore, the facility is “LNG ready,” in the sense that the facility can burn LNG from any source that is regasified and placed into the pipeline system, including LNG delivered to Canaport in New Brunswick, or to the Northeast Gateway or Neptune LNG terminals, both located off the Gloucester coast (Tr. 2, at 324-25; Tr. 6, at 999). Consequently, the Company expects that natural gas supply to the facility would not be curtailed (Tr. 2, at 323).

The Company described in detail the reasons that it does not anticipate any gas curtailment on the M&NE system. For example, the Company noted that, while many gas-fired generating facilities in the New England area obtain their fuel from the south, the M&NE Pipeline supplies gas from Canadian sources to the north (Exh. EFSB-G-16). The Company asserts that access to the M&NE system is advantageous as this pipeline has been operating at much less than its available capacity in recent years while the pipelines that bring natural gas from the south currently face capacity limitations on many days – particularly during the winter (Exh. EFSB-G-51). The Company noted that several supply sources are connected to the M&NE Pipeline including gas from offshore Nova Scotia (Sable Island and Deep Panuke), Western Canadian gas through the Portland Natural Gas Transmission System, and regasified LNG from

---

<sup>7</sup> In March 2013, ISO-NE stated that the electric grid faced “operational challenges” and “serious reliability threats” because of the region’s reliance on natural gas-fired generation and the inadequate gas supply arrangements for much of that generation, almost all of which is subject to interruption during the winter peak season (Exh. EFSB-5, at 1). ISO-NE also stated that it was working toward market solutions to solve this reliability problem (*id.* at 7-8).

<sup>8</sup> Ultra low sulfur distillate (“ULSD”) fuel would be used for the emergency generator and the fire pump engine (Exh. SHR-8, at 2-4, 5-13).

the Canaport LNG facility (Tr. 6, at 1020, 1029). The Company also noted that new sources of gas, both conventional and from hydraulic fracturing, may become available in the Maritimes region in the future (*id.* at 1020). The Company indicated that the M&NE Pipeline also connects to the Tennessee Gas Pipeline system in Dracut, and that potential future upgrades to the Tennessee system may allow for the injection of supplies from Tennessee into the M&NE Pipeline, although that does not occur at present (RR-EFSB-36). The Footprint facility could also access LNG through regasification of LNG cargo deliveries into the HubLine system via the Northeast Gateway and Neptune facilities (Tr. 6, at 999).

The Company indicated that it has begun initial discussions with potential gas suppliers, but that no contractual arrangements have yet been made. The Company explained that it is not able to sign gas contracts until it knows that it is going to build the plant (Tr. 6, at 1004). Given the commercially sensitive nature of its ongoing gas supply discussions, Footprint declined to provide specific details regarding its gas supply objectives, such as whether it is seeking firm or interruptible gas supplies or pipeline capacity (Tr. 6, at 1002).<sup>9</sup>

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<sup>9</sup> In the Final Determination issued in EFSB 98-1, *Notice of Inquiry with Regard to the Siting Board's Standard of Review for Generating Facility Viability*, 7 DOMSB 19 (1998) ("1998 Viability Order"), the Board defined its jurisdiction in light of Electric Restructuring and the recent amendments to the EFSB statute. In the 1998 Viability Order, the Board noted that "G.L. c. 164, § 69H limits the Siting Board's review of proposed generating facilities to the environmental impacts of those facilities" (1998 Viability Order at 7). The Board concluded that, consistent with the statutory directive not to consider the need for and cost of proposed generating facilities, it would no longer consider whether such facilities were viable, and therefore would not consider the adequacy of a developer's fuel acquisition strategy (1998 Viability Order at 9).

The Board does still consider reliability in the context of determining whether environmental impacts have been minimized. For instance, when a Section 69J¼ applicant sought a project change to increase the number of days it could operate using oil as a back-up fuel, the Board concluded that the greater environmental impacts caused when burning oil instead of natural gas were balanced by the reliability benefits to the electric grid. *Fore River Development LLC*, 15 DOMSB 403 (2006). However, in this proceeding, we decline to consider whether the Board should condition approval to build a generating facility in a way that would require the applicant to install dual-fuel capability or on-site storage of back-up fuel.

B. Procedural History

The Company filed the Petition on August 3, 2012, and the Siting Board conducted a public comment hearing in Salem on September 19, 2012. The project is located within five miles of Environmental Justice (“EJ”) populations, as defined by the EJ Policy issued by the Executive Office of Environmental Affairs (“EOEA”) in 2002, thus requiring enhanced public participation in the Siting Board proceeding. Footprint implemented the enhanced public participation requirement by translating and widely publishing the public hearing notice in both English and Spanish, and providing a Spanish and Portuguese language translator at the public hearing (Affidavit of Karla J. Doukas dated September 18, 2012 submitted with the Return of Service, at 1 “Doukas Affidavit”<sup>10</sup>; Transcript of the Public Meeting in Salem, September 19, 2012, at 41). Furthermore, Footprint representatives held a meeting with the Point Neighborhood Association (“PNA”) at which a translator who spoke both Spanish and Portuguese was present and her services were used (Tr. 8, at 1309-1310; Tr. Public Meeting in Salem, September 19, 2012, at 41).<sup>11</sup>

The presiding officer granted intervention requests by the following entities: the City of Salem (“City”); Salem State University; the North Shore Community Development Coalition; National Grid; the International Brotherhood of Electrical Workers (“IBEW”) Local 326; Salem Alliance for the Environment (“SAFE”); the Conservation Law Foundation (“CLF”); and the Historic Derby Street Neighborhood Association/Point Neighborhood Association (“HDSNA/PNA”). In addition, two individuals, Benjamin Pignatelli and Richard Kerver, were granted limited participant status.

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<sup>10</sup> Ms. Doukas’s affidavit is not part of an exhibit in this proceeding. Nevertheless, the Board may take official notice of it, as the affidavit is part of the return of service that is in the physical possession of the Board staff (980 C.M.R. 1.06(7)) (“Official notice may be taken in such matters as might be judicially noticed by the Courts of the United States or of Massachusetts”). The Courts of the United States routinely take notice of their own records. Anderson v. F.D.I.C., 918 F.2d 1139, 1141 n. 1 (4<sup>th</sup> Cir. 1991); In re Lee, 472 B.R. 156, 166 n. 7 (Bank.D.Mass. 2012). No party has questioned the veracity of the statements in this affidavit.

<sup>11</sup> Both the PNA and the Company indicated that the PNA represents an Environmental Justice community. Petition to Intervene by Historic Derby Street Neighborhood Association and Point Neighborhood Association of Salem, dated October 12, 2012, at 1; Tr. 8, at 1309-1310. Compliance with the EJ policy is described in Section V.B.2, below.

During the discovery phase of the proceeding, Siting Board staff and the intervenors issued a total of eight rounds of information requests to Footprint. Staff also issued one set of information requests to National Grid, and one set of information requests to the City. Board staff held ten days of evidentiary hearings in March and April of 2013. In early May 2013, Footprint, CLF, and the City filed initial briefs, and National Grid submitted a short letter in lieu of a brief. Footprint, CLF, and the City filed reply briefs in mid-May 2013. The HDSNA/PNA and Richard Kerver each filed only one brief, and they did so after the date on which initial briefs were due but on or before the deadline for reply briefs. The HDSNA/PNA document was labeled a “reply brief.” Both Footprint and the City obtained permission and filed a response to the HDSNA/PNA brief.

The positions taken by the parties in the briefs may be summarized as follows: the City supports approval of the Petition with specific conditions; CLF opposes approval of the Petition. The HDSNA/PNA expresses serious reservations regarding the project, and suggests that, if it is approved (despite the HDSNA/PNA’s reservations), the Siting Board should impose conditions to mitigate the potential negative environmental impacts on the community and abutting neighborhoods. Mr. Kerver’s brief did not explicitly argue in favor or against approving the Petition; instead, his brief addressed general environmental and energy concerns, especially the harm allegedly caused by hydraulic fracturing.

The City filed two motions to strike. First, it filed a motion to strike four exhibits to the CLF initial brief on the grounds that these exhibits had not been introduced into evidence. CLF filed an opposition on May 14, 2013, and the City’s motion was allowed on May 15, 2013. The exhibits themselves were struck from the record, and all citations to any of these exhibits were struck from CLF’s initial brief. The City’s second motion to strike asserted that Mr. Kerver had included evidentiary material not in the record in his brief. This motion was allowed in part and denied in part.

The Board staff prepared an Issues Memorandum and distributed it to Siting Board members, all parties, and the limited participants on July 2, 2013. The Siting Board held a public meeting to consider the Issues Memorandum on July 11, 2013, at which counsel for parties, a representative of the HDSNA/PNA, elected officials, and one of the limited participants spoke. After deliberation, the Board directed staff to draft a Tentative Decision that would approve the Petition with conditions.

C. Jurisdiction and Scope of Review

Footprint filed its petition to construct the proposed facility in accordance with G.L. c. 164, § 69J¼. Pursuant to G.L. c. 164, § 69J¼, no applicant shall commence construction of a “generating facility” unless a petition for approval of construction of that generating facility has been approved by the Siting Board. Pursuant to G.L. c. 164, § 69G, a jurisdictional “generating facility” is defined as “any generating unit designed for or capable of operating at a gross capacity of 100 megawatts or more, including associated buildings, ancillary structures, transmission and pipeline interconnections that are not otherwise facilities, and fuel storage facilities.” Because the proposed facility is capable of operating at a gross capacity of 100 MW or more, it is a “generating facility” requiring Siting Board approval under G.L. c. 164, § 69J¼.

In accordance with G.L. c. 164, § 69J¼, before approving a petition to construct a generating facility, the Siting Board must determine that the applicant has met five requirements.

First, the Siting Board must determine that the applicant’s description of the site selection process used is accurate (see Section II, below). Second, if the expected emissions from the proposed facility do not meet the applicable Technology Performance Standard, the Siting Board must determine, based on a comparison with other fossil fuel generating technologies, that the proposed generating facility, on balance, contributes to a reliable, low-cost, diverse regional energy supply with minimal environmental impacts (see Section III, below). Third, the Siting Board must determine that the applicant’s description of the proposed generating facility and its environmental impacts is substantially accurate and complete (see Section IV, below). Fourth, the Siting Board must determine that the proposed generating facility will minimize environmental impacts consistent with the minimization of costs associated with mitigation, control, and reduction of the environmental impacts (see Section IV, below). Fifth, the Siting Board must determine that plans for construction of the proposed generating facility are consistent with current health and environmental protection policies of the Commonwealth and with such energy policies as are adopted by the Commonwealth for the specific purpose of guiding the decisions of the Board (see Section V, below).

## II. SITE SELECTION

### A. Standard of Review

G.L. c. 164, § 69J¼ requires the Siting Board to determine whether an applicant's description of the site selection process used is accurate. An accurate description of an applicant's site selection process must include a complete description of the environmental, reliability, regulatory and other considerations that led to the applicant's decision to pursue the facility at the proposed site, as well as a description of other siting and design options the applicant considered.

The Siting Board also is required to determine whether a proposed facility contributes to a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. G.L. c. 164, § 69H. In order for the Siting Board to accomplish its mandate, G.L. c. 164, § 69J¼ requires the Siting Board to determine whether "plans for the construction of a proposed facility minimize the environmental impacts consistent with the minimization of costs associated with the mitigation, control, and reduction of the environmental impacts of the proposed generating facility." Site selection, together with project design and mitigation, is an integral part of the process of minimizing the environmental impacts of an energy facility. Upon fulfilling the requirements of section 69J¼, a generating facility will be deemed to contribute to a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. G.L. c. 164, § 69J¼.

### B. Description

Footprint focused its site selection process on properties where there were shuttered or problematic coal- and/or oil-fired generating facilities. The Company stated that its primary objective is to redevelop this type of site for use as a cleaner and more efficient natural gas generating facility (Exh. SHR-1, at 53, 54; Tr. 2, at 399). Footprint indicated that its site selection process was predicated on its ability to develop a facility with quick-start capability (Exhs. SHR-1, at 54; SHR-8-S at 3-2).

Footprint's search for an appropriate project site focused on the northeastern United States largely due to the industry experience and expertise of the Company's founders (Tr. 2,

at 399, 419). The Company stated that it focused on Massachusetts, where its executives had the most experience and, therefore, the best information and understanding to evaluate potential sites (id. at 399). Additionally, the Company stated that Massachusetts is particularly well suited for the type of facility it is proposing because the quick-start capability supports the development of intermittent energy from wind generation, a priority in Massachusetts (Exh. SHR-1, at 54, 55; Tr. 2, at 399). The Company indicated that it focused primarily on coastal sites since older coal-fired facilities are often located adjacent to large bodies of water (Exhs. SHR-1, at 54; SHR-8-S at 3-1). In addition, the Company explained that it was looking for a site with adequate transmission “headroom” to enable the facility to deliver its full output to the grid (Tr. 2, at 286).

In addition to the general objectives that aided Footprint in identifying appropriate project sites, the Company employed several criteria pertaining to location, environment, and community to identify and analyze alternative sites (Exh. SHR-1, at 55). The location considerations included: sufficient acreage (a minimum of 20 acres); proximity to electric load; availability of natural gas (a pipeline interconnection within five miles of the site); availability of electrical interconnection to the grid; adequate water supply; compatibility with local zoning and surrounding uses; and a limited number of sensitive receptors in close proximity to the project site (Exh. SHR-7, at 4-3). Considerations related to the environment included: ability to reduce current air quality impacts; potential to return coastal properties to productive use; ability to minimize impacts related to water consumption, wastewater, wetlands, noise, land use, historical and archaeological resources, cultural, visual, traffic, solid and hazardous waste, electric and magnetic field effects; and the safe transportation and storage of ammonia and other materials (id. at 4-3 and 4-4; Exh. SHR-1, at 56). In assessing the community factors of potential sites, Footprint focused on the level of support from municipal officials and neighbors, the expected ease of permitting, and the importance to the host community of continuing tax revenues and project-related jobs (Exhs. SHR-1, at 57; SHR-7, at 4-4).

The Company identified four sites in Massachusetts where coal-fired facilities were currently or recently operating: Salem Harbor Station, Brayton Point in Somerset, Somerset Station in Somerset, and Mount Tom in Holyoke (Exh. SHR-1, at 57). The first three sites are located on the coast, while Mount Tom is located inland (Exhs. EFSB-SS-11). Benefits of the Salem site include its location within the Northeast Massachusetts (“NEMA/Boston”) load zone (which consists of over 40 percent of Massachusetts electricity load and where the Company

anticipated a need for additional generation capacity); close proximity to the electrical transmission grid; available interstate gas pipeline facilities within two miles; sufficiently large site size; and an indication of local support (Exhs. EFSB-SS-6; EFSB-SS-7; SHR-1, at 60-61).

Brayton Point met many of the site selection criteria that Footprint developed. However, it was eliminated as a potential site as the plant owner, Dominion Energy, had recently invested \$1.1 billion in environmental improvements to the facilities, leading Footprint to believe the plant was no longer the type of “problematic site” that Footprint aimed to redevelop. In addition, Brayton Point is not located in the NEMA/Boston load zone and therefore offered less market opportunity (Exhs. SHR-1, at 57; EFSB-SS-6).

Somerset Station was removed from consideration for a number of reasons. Footprint determined that there would be insufficient support for a new generating facility by local officials and residents (Exh. SHR-7, at 4-10). The site is not close to natural gas pipeline facilities, nor is it located in the NEMA/Boston load zone (Exhs. SHR-1, at 58; SHR-8-S at 3-6; EFSB-SS-6). Further, Somerset Station was sold in February 2012, and the buyer indicated that the future use of the site would not include a power plant (Exh. SHR-1, at 58).

The location of Mount Tom had multiple drawbacks – the site is not near gas pipeline facilities and it is located outside of the NEMA/Boston region (*id.* at 59; Exh. EFSB-SS-6). Further, Footprint anticipated development and permitting difficulties in building the transmission infrastructure that would be necessary to accommodate the facility size it wanted to construct (Exh. EFSB-SS-6). Finally, the owners of the Mount Tom facility recently invested \$57 million in emissions control equipment (*id.*). These factors led Footprint to eliminate Mount Tom from further consideration.

There was no formal scoring system to rank the four sites using the criteria Footprint identified as important (Tr. 2, at 401). The Company’s analysis consisted of a matrix with observations of the four candidate sites in the following general categories: environmental, cost, reliability and community (Exhs. SHR-7, at 4-13; EFSB-SS-6). The matrix did not address specific environmental impacts such as traffic, noise, and visual concerns (Exh. EFSB-SS-6). With regard to locating in a densely developed neighborhood, the Company did not conduct an analysis to determine the difference in population densities surround the four sites, however, it characterized Somerset and Brayton Point as similar to Salem Harbor in that regard (Tr. 2,

at 432). The Company asserted that upon screening the four sites, only Salem Harbor met all the criteria and, therefore, there was no need to conduct a numerical ranking (Tr. 2, at 401).

With regard to selecting the size of the proposed facility at the Salem location, Footprint indicated that larger facilities offer economies of scale. However, the Company noted that the size is effectively limited by the available capacity on the electric transmission system at Salem Harbor. In addition, the Company indicated that the Salem community would be unlikely to support a new facility larger than the existing Salem Harbor Station (Exh. EFSB-SS-4).

C. Intervenors' Positions

CLF asserts that the type of facility that Footprint is proposing, a gas-fired combined cycle air-cooled generating facility, could be located in an upland area (CLF Brief at 20). CLF argues that, at a minimum, the Company's Petition should have provided far more detail regarding alternative upland sites (id.).

The HDSNA/PNA is not convinced that the project is needed to ensure a reliable energy supply, nor that a project of this size is warranted at this location (HDSNA/PNA Brief at 3). The HDSNA/PNA objects to locating the proposed project in the densely populated, commercially valuable, and historic Salem Harbor area (id. at 4).

D. Analysis and Findings

The record shows that, based on its business model, the Company evaluated only sites that were operating as coal- and oil-fired facilities in Massachusetts, which limited the review to four sites – of which some had serious drawbacks. After conducting a general investigation of the sites, the Company determined that the proposed Salem Harbor Station site is the preferred site among the four in that it is proximate to load, close to electrical transmission facilities and a gas pipeline, and likely to present fewer environmental impacts than the other sites under consideration. The Company determined that based on its location in NEMA/Boston load zone, financial benefits associated with existing infrastructure, and the level of community support, Salem Harbor offered the most suitable site for the proposed facility. Disadvantages of the site include the high density of adjacent residential neighborhoods and relatively poor road access in a congested area.

Overall, Footprint's site selection process was constrained given the limited focus on a specific type of existing power plant. However, Footprint identified advantages of using existing infrastructure at the proposed site, which include electric transmission, access to docks for material deliveries by water, and sewer infrastructure. The Siting Board notes that reuse of previously disturbed sites and the continuing use of existing infrastructure can reduce many of the environmental impacts associated with industrial development. Although there would be benefits from reuse of the existing site for the proposed facility, the Salem Harbor site also abuts a densely populated residential area. Therefore, as noted in this Decision, Footprint would need to minimize an array of environmental impacts to the surrounding community, such as noise, visual intrusion, and traffic through comprehensive design and mitigation measures.

With regard to the Company's analysis of upland sites, which CLF argues was deficient, we note that Board precedent does not require the Company to make an exhaustive survey of all available sites. Of the four sites evaluated, one, Mount Tom, is located inland and did not compare favorably to Salem Harbor. The Company's evaluation of alternative sites, including upland site locations, is reasonable, based on appropriate criteria, and is consistent with Board precedent.

With respect to site selection, G.L. c. 164, § 69J¼ provides that a petitioner must meet the requirement that "the description of the site selection process used is accurate." The Supreme Judicial Court of Massachusetts in the Town of Andover v. Energy Facilities Siting Board, 435 Mass. 377 (2001) affirmed that the Siting Board's minimum duty with respect to site selection review is to determine whether the petitioner's description of its site selection process is accurate. Here, there is nothing in the record to indicate that the petitioner's description of its site selection process was inaccurate. Additionally, the factors that guided the site selection process and the information provided in the site selection process contributed to the minimization of environmental impacts (see Section IV, below).

Accordingly, the Siting Board finds that Footprint provided an accurate description of its site selection process and that the Company's site selection process contributed to minimizing the environmental impacts of the proposed facility.

### III. TECHNOLOGY

#### A. Technology Selection

The Siting Board's Technology Performance Standard ("TPS"), 980 C.M.R. 12.00, requires a proponent to prepare an analysis of other fossil fuel generating technologies if the project does not meet a published set of emissions criteria.

##### 1. Standard of Review

G. L. c. 164, § 69J¼ requires the Siting Board to promulgate a technology performance standard for generating facility emissions. The TPS is to be used solely to determine whether a petition to construct a generating facility must include information regarding fossil fuel generating technologies other than the technology proposed by the petitioner. G. L. c. 164, § 69J¼. If the expected emissions of the facility do not meet the TPS in effect at the time of filing, the petitioner must include in its petition a description of the environmental impacts, costs, and reliability of other fossil fuel generating technologies, and an explanation of why the proposed technology was chosen. Id. The Siting Board must then determine whether the technology selection for the proposed generating facility, on balance, contributes to a reliable, low cost, diverse regional energy supply with minimal environmental impacts. Id.

##### 2. Analysis and Findings

Footprint calculated project emission rates for the five criteria pollutants and 16 non-criteria pollutants for which the Siting Board has set TPS criteria (Exh. SHR-1, at 49-51). For the criteria pollutants, the generating facility's potential emission rates fall below the TPS, as shown in Table 1; furthermore, the Company presented data showing that it will not have detectable emissions of the 16 non-criteria TPS-specified pollutants (id. at 51). Therefore, the Siting Board finds that the Company is not required to provide a comparison of the technology for the proposed generating facility relative to potential alternative technologies. See 980 C.M.R. 12.02.

**Table 1. Comparison of Proposed Facility Emissions to EFSB TPS for Criteria Pollutants**

| Pollutant                            | Facility Emissions (lbs/MWh) | TPS (lbs/MWh) |
|--------------------------------------|------------------------------|---------------|
| Sulfur dioxide (“SO <sub>2</sub> ”)  | 0.010                        | 0.021         |
| Nitrogen oxides (“NO <sub>x</sub> ”) | 0.051                        | 0.120         |
| Particulates/PM <sub>10</sub>        | 0.040                        | 0.081         |
| Carbon monoxide (“CO”)               | 0.031                        | 0.077         |
| Volatile organic compounds (“VOC”)   | 0.009                        | 0.035         |

Sources: Exh. SHR-8-S-1, at 4; 980 C.M.R. 12.02

As the project meets the TPS criteria, the Siting Board finds that the Company’s technology selection, on balance, contributes to a reliable, low cost, diverse regional energy supply with minimal environmental impacts.

#### IV. ENVIRONMENTAL IMPACTS

##### A. Standard of Review

G. L. c. 164, § 69J¼ requires the Siting Board to determine whether the plans for construction of a proposed generating facility minimize the environmental impacts of the proposed facility consistent with the minimization of costs associated with the mitigation, control, and reduction of the environmental impacts of the proposed generating facility. In order to make this determination, the Siting Board assesses the impacts of the proposed facility in eight areas prescribed by its statute – air quality, water resources, wetlands, solid waste, visual impacts, noise, local and regional land use, and health – and determines whether the applicant’s description of these impacts is accurate and complete.<sup>12</sup> G. L. c. 164, § 69J¼.

The Siting Board also assesses the costs and benefits of options for mitigating, controlling, or reducing these impacts, and determines whether mitigation beyond that proposed by the applicant is required to minimize the environmental impacts of the proposed facility consistent with the minimization of costs associated with the mitigation, control, and reduction of the environmental impacts of the proposed generating facility. Compliance with other

<sup>12</sup> The Siting Board also reviews in this Decision the environmental impacts of the proposed project with regard to traffic and safety.

agencies' standards does not necessarily establish that a proposed facility's environmental impacts would be minimized.

Finally, the Siting Board assesses any tradeoffs that need to be made among conflicting environmental impacts, particularly where an option for mitigating one type of impact has the effect of increasing another type of impact. An assessment of all impacts of a facility is necessary to determine whether an appropriate balance is achieved among conflicting environmental concerns and between environmental impacts and cost. A facility proposal that achieves this balance meets the Siting Board's statutory requirement to minimize environmental impacts consistent with minimizing the costs associated with the mitigation, control, and reduction of the environmental impacts of the proposed generating facility.

B. Air

1. Operation

This section describes applicable regulations, baseline air quality conditions, emissions impacts of the proposed facility, and compliance with existing regulations. The plant's turbines will be gas fired only, with up to 8,760 hours of operation per year (Exh. SHR-1, at 1, 67). In each of these air-related assessments, the Company used the emissions associated with the proposed facility and compared them to a future baseline scenario where the existing Salem Harbor Station is shut down, and not replaced by any other generation at the site.

a. Applicable Regulations

The Company indicated that the air quality programs administered by the United States Environmental Protection Agency ("USEPA") and the Massachusetts Department of Environmental Protection ("MassDEP") that apply to the proposed facility are: National Ambient Air Quality Standards ("NAAQS");<sup>13</sup> Prevention of Significant Deterioration ("PSD"); New Source Review ("NSR") requirements; New Source Performance Standards ("NSPS"); Hazardous Air Pollutants ("HAPs") requirements; and the Clean Air Interstate Rule ("CAIR") (Exh. SHR-1, at 64). All areas of the country are classified as attainment, unclassifiable, or

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<sup>13</sup> The MassDEP has adopted the NAAQS limits as the Massachusetts Ambient Air Quality Standards ("MAAQs") (Exh. SHR-1, at 64).

nonattainment with respect to NAAQS for the six criteria pollutants: SO<sub>2</sub>, PM, nitrogen dioxide (“NO<sub>2</sub>”), CO, ozone, and lead (*id.* at 64-65). PM is regulated in two particle size classes: particulates with a diameter of ten microns or less (“PM<sub>10</sub>”) and particulates with a diameter of 2.5 microns or less (“PM<sub>2.5</sub>”) also known as fine particulates (*id.*).

The site is presently classified as attainment and attainment/unclassifiable for all criteria pollutants except ozone,<sup>14</sup> which is classified as nonattainment (*id.* at 65; Exh. SHR-8, at 4-4). The proposed facility is considered to be a major PSD source since it has the potential to emit more than 100 tons per year (“tpy”) of one or more criteria pollutants (Exh. SHR-1, at 67).<sup>15</sup> Based on the applicable emissions criteria, the proposed facility is subject to PSD review for particulate matter, NO<sub>x</sub>, and CO (Exh. SHR-8, at 4-3). In order to obtain a PSD permit, an applicant must demonstrate that the Best Available Control Technology (“BACT”) has been selected and that a project will comply with NAAQS and the PSD increment requirements (*id.*). In addition, since the proposed facility’s NO<sub>x</sub> emissions exceed the major source threshold, review under Nonattainment NSR is required (Exh. SHR-8, at 4-4). The facility will be required to acquire offsets and implement Lowest Achievable Emissions Rate (“LAER”) for NO<sub>x</sub> (*id.*).

b. Baseline Air Quality

The Company conducted air quality modeling for the project using the AERMOD atmospheric dispersion modeling system, as recommended by the USEPA (Exh. SHR-8, at 6-3). Footprint presented background air quality measurements based on data from the MassDEP monitoring stations considered most representative based on proximity to the site (Exh. SHR-1, at 75). The model input data were obtained from two monitoring sites: NO<sub>2</sub>, PM<sub>2.5</sub>, CO, and ozone data were from a monitoring station located approximately 5.9 miles southwest of the site in Lynn; SO<sub>2</sub>, PM<sub>10</sub>, and lead data were from a monitoring station located 17 miles southwest of the site at Harrison Avenue in Boston (Exh. SHR-1, at 75). The background air quality concentrations for all pollutants are in compliance with the NAAQS (*id.* at 76).

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<sup>14</sup> The Footprint site and most of Massachusetts are considered in attainment/unclassifiable for ozone by the USEPA; however, MassDEP has not yet revised its Nonattainment NSR provisions (Exh. SHR-8, at 4-4).

<sup>15</sup> The PSD program is administered by MassDEP (Exh. SHR-1, at 67).

c. Emission Impacts and Compliance

Projected air emissions and dispersion modeling for the proposed facility address the combustion turbine units, the auxiliary boiler, the emergency generator and the fire pump engine (Exh. SHR-8, at 6-1). The new facility will have one stack, which is proposed to be 230 feet tall and 60 feet in diameter (Exh. SHR-1, at 19). The “Good Engineering Practice” (“GEP”) stack height for the facility would be 312.5 feet, based on the dimensions of nearby proposed buildings on the site (Exh. SHR-8, at 6-4). Footprint proposed the stack height of 230 feet “because it allows the facility to meet all applicable air emission standards, increments, and guidelines by a large margin, while also minimizing visual impacts” (Exh. EFSB-A-36). The Company noted that the greatest incremental reductions in maximum pollutant concentrations occur as the modeled stack height is raised to 230 feet from 220 feet, with diminishing improvements at heights above 230 feet (Tr. 2, at 383; Tr. 7, at 1471).

Footprint filed a Comprehensive Plan Approval Application and two supplements with MassDEP (Exhs. SHR-8; SHR-8-S; SHR-8-S-1). The Comprehensive Plan Approval Application and supplements contain BACT and LAER analyses for air emissions, as required by MassDEP and USEPA (Exhs. SHR-8; SHR-8-S; SHR-8-S-1). The facility will acquire offsets and implement LAER for NO<sub>x</sub> (Exh. SHR-1, at 69). Proposed air pollution control systems include dry low-NO<sub>x</sub> combustion technology and a selective catalytic reduction system to control NO<sub>x</sub>, as well as an oxidation catalyst for control of CO and VOCs (Exh. SHR-8, at 5-2 to 5-4). A summary of project air emissions and control technology is provided in Table 2, below.

**Table 2. Project Emissions of Criteria Pollutants/Precursors and Methods of Control**

| Pollutant                        | Facility Annual Max Emissions | Stack Concentration   | Control Method  |
|----------------------------------|-------------------------------|---|---|
| NO <sub>2</sub> /NO <sub>x</sub> | 144.8 tons/yr                 | 2.0 ppm @ 15% O <sub>2</sub>  | Dry low NO <sub>x</sub> combustors, Selective Catalytic Reduction |
| CO                               | 106.4 tons/yr                 | 2.0 ppm@ 15% O <sub>2</sub>   | Oxidation Catalyst  |
| VOC                              | 28.0 tons/yr                  | 1.0 ppm@ 15% O <sub>2</sub><br>(w/o duct firing)<br>1.7 ppm@ 15% O <sub>2</sub><br>(with duct firing) | Oxidation Catalyst  |
| Particulates                     | 109.4 tons/yr                 | < 0.009 lbs/MMBtu   | Fuel Selection with good combustion practices                     |
| SO <sub>2</sub>                  | 28.8 tons/yr                  | 0.3 ppm @ 15% O <sub>2</sub>  | Fuel Selection  |

Source: Exhs. SHR-8; SHR-8-S-1, at Tables 3-1 and 3-3

**Table 3. Project Emission Impacts with Stack Height of 230 Feet**

| Pollutant         | Averaging Period | Significant Impact Level (µg/m <sup>3</sup> ) | Maximum Projected Impact (µg/m <sup>3</sup> ) | Exceeds SILS? | NAAQS (µg/m <sup>3</sup> ) |
|-------------------|------------------|---|---|---------------|----------------------------|
| NO <sub>2</sub>   | 1-hour           | 7.5   | 41.80   | yes           | 188                        |
|                   | Annual           | 1.0   | 0.40  | no            | 100                        |
| SO <sub>2</sub>   | 1-hour           | 7.8   | 1.00  | no            | 196                        |
|                   | 3-hour           | 25.0  | 1.10  | no            | None                       |
|                   | 24-hour          | 5.0   | 0.70  | no            | 365                        |
|                   | Annual           | 1.0   | 0.03  | no            | 80                         |
| PM <sub>10</sub>  | 24-hour          | 5.0   | 4.30  | no            | 150                        |
| PM <sub>2.5</sub> | 24-hour          | 1.2   | 3.20  | yes           | 35                         |
|                   | Annual           | 0.3   | 0.12  | no            | 12                         |
| CO                | 1-hour           | 2,000.0                                       | 313.60  | no            | 40,000                     |
|                   | 8-hour           | 500.0   | 112.40  | no            | 10,000                     |

Source: Exh. SHR-8-S-1, at Tables 4-1, 6-9, and 6-11

Because the significant impact levels (“SILs”) for one-hour NO<sub>2</sub> and 24-hour PM<sub>2.5</sub> are exceeded, as shown above in Table 3, the Company conducted interactive modeling of the maximum predicted facility emissions plus ambient background concentrations for these two criteria pollutants to undertake a NAAQS compliance assessment (Exh. SHR-8-S-1, at Table 6-11).<sup>16, 17</sup> For 24-hour PM<sub>2.5</sub> the background is 19.2 micrograms per cubic meter (“μg/m<sup>3</sup>”); the maximum projected impact for Footprint is 3.2 μg/m<sup>3</sup>, (as shown in Table 3), and the cumulative impact concentrations from Footprint and two other area sources is 3.5 μg/m<sup>3</sup>. Therefore, the total impact plus background is 22.7 μg/m<sup>3</sup>, which is less than the NAAQS of 35 μg/m<sup>3</sup> (id.). For one-hour NO<sub>2</sub>, the background is 82.3 μg/m<sup>3</sup> and the cumulative impact concentration from Footprint and four area sources is less than 105.7 μg/m<sup>3</sup> at all locations where Footprint adds a significant concentration; therefore, the total impact plus background is less than 188 μg/m<sup>3</sup> at relevant locations (id.). Based on this assessment, the total concentrations are below the NAAQS (Exhs. SHR-8-S-1, at 6-11; SHR-8, at 6-14; SHR-17, at 14).

Air modeling data submitted to MassDEP in the Comprehensive Plan Approval Application (both original and supplemental) show that the highest ground-level concentrations would be close to the stack. However, the modeling indicates that emissions from the proposed facility would not result in an excess of criteria pollutants in violation of the NAAQS (Exhs. SHR-8, at 6-14; SHR-17, at 14). The Company provided an analysis of a range of stack heights from 200 to 250 feet pertaining to the dispersion of NO<sub>2</sub> and PM<sub>2.5</sub>, both predicted to

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<sup>16</sup> Throughout the case, air modeling was based on worst-case emissions of either the Siemens or GE turbine options (Exhs. SHR-8; SHR-8-S-1, at 1). The Company has now selected the GE 7F 5-Series Turbine and revised its air modeling plans, which have been submitted for approval to MassDEP and as evidence in this proceeding (Exhs. SHR-8-S-1; EFSB-G-4-S). Previously, SILs were exceeded for one-hour NO<sub>2</sub>, 24-hour PM<sub>10</sub>, and 24-hour and annual PM<sub>2.5</sub> (Exh. SHR-8, at 6-9). Table 3 is based on the selection of the GE turbine, which was included in the Company’s second supplement to the Comprehensive Plan Approval Application.

<sup>17</sup> USEPA requires air modeling from cumulative sources when SILs are exceeded. The two interacting sources are the General Electric Aviation Facility in Lynn (7.1 miles away) and the Wheelabrator Facility in Saugus (7.8 miles away) (Exh. EFSB-A-20-S). In addition, the second supplement to the Comprehensive Plan Approval Application includes Peabody Municipal Light, Rousselot Peabody, and Marblehead Municipal Light as interacting sources for one-hour NO<sub>2</sub> (Exh. SHR-8-S-1, at 4).

exceed the SILs (Exh. EFSB-A-36; RR-EFSB-3; Tr. 2, at 381-382). Raising the stack height by 20 feet above the proposed height of 230 feet, at a cost of \$200,000 to \$300,000, would reduce maximum ground-level impacts (Exh. EFSB-H-10; RR-EFSB-3). Other than for start-up conditions, the highest one-hour NO<sub>2</sub> concentrations would be reduced from 3.6 µg/m<sup>3</sup> to 2.1 µg/m<sup>3</sup>; and the highest 24-hour PM<sub>2.5</sub> concentrations would be reduced from 2.1 µg/m<sup>3</sup> to 1.0 µg/m<sup>3</sup> with 20 feet of added stack height (RR-EFSB-3). These reductions would result in cumulative impact concentrations plus background being an additional 0.8 percent and 3.1 percent below the NAAQS for one-hour NO<sub>2</sub> and 24-hour PM<sub>2.5</sub>, respectively.

d. Offsets and Allowances

Under the NSR program, the proposed project is required to obtain NO<sub>x</sub> emission offsets at a ratio of 1.26 tons of offsets per ton of the facility's maximum potential emissions. Therefore, using the selected GE turbine, the Company must purchase a total of 183 tpy of NO<sub>x</sub> offsets (Exh. SHR-1, at 69). The Company has obtained 194 tpy of offsets from four sources (Exh. SHR-8-S-1, at 4).<sup>18</sup> In addition to the NO<sub>x</sub> offsets required under the NSR program, NO<sub>x</sub> allowances are required in Massachusetts under the CAIR program to cover the number of tons emitted during the ozone season, from May through September (Exh. SHR-8, at 4-8). The net NO<sub>x</sub> allowance allocation by MassDEP in 2012 applicable to the proposed facility was 0.7 pounds per megawatt-hour ("lbs/MWh") while the proposed facility's estimated emission rate is 0.05 lbs/MWh (Exh. EFSB-A-5). On this basis, the Company stated it expects to receive sufficient CAIR NO<sub>x</sub> allowances (*id.*).

The Global Warming Solution Act ("GWSA"), enacted in August 2008, is a comprehensive regulatory program to address climate change in Massachusetts. St. 2008, c. 298. The GWSA mandates that the Commonwealth reduce its greenhouse gas ("GHG") emissions by at least 80 percent below 1990 levels by 2050.<sup>19</sup> G. L. c.21N, §3(b). The Massachusetts Clean

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<sup>18</sup> Based on an evaluation of the Siemens turbine, the Company had calculated that 200 tpy of NO<sub>x</sub> offsets would be required (Exh. SHR-8, at 8-2).

<sup>19</sup> The GWSA requires that the Secretary of the Executive Office of Energy and Environmental Affairs ("EOEEA"), in consultation with MassDEP and Massachusetts Department of Energy Resources ("DOER"), set a 2020 statewide GHG emissions limit of between 10 percent and 25 percent below the 1990 emissions level and a develop a

Energy and Climate Plan for 2020, developed by the Secretary of the EOEEA (“Secretary”) and issued in 2010 (“Climate Plan”), sets a 25 percent reduction requirement from 1990 GHG levels by 2020 and describes some possible ways to achieve the 80 percent reduction by 2050.<sup>20, 21</sup>

The Company estimated a CO<sub>2</sub> emission rate of 842 lbs/MWh for the facility (Exh. SHR-8, at 5-12).<sup>22, 23</sup> For the highest facility emissions scenario – operation at 100 percent

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plan to achieve that limit. G. L. c. 21N, §4(a). The Secretary must update this plan for “achieving the maximum technologically feasible reductions” at least once every five years, including plans to implement interim statewide emissions limits for 2030 and 2040 that maximize the ability to meet the 2050 limit. G. L. c. 21N, §§3(b), 4(h).

<sup>20</sup> The Climate Plan is subtitled “A report to the Great and General Court pursuant to the Global Warming Solutions Act” and was submitted on December 29, 2010. In addition to setting the 25 percent reduction requirement for 2020 and describing scenarios to achieve the 2050 limit, the Climate Plan adopts a plan to achieve the 2020 target. The Climate Plan “fulfills the requirements” of G.L. c. 21N, § 4(a). Climate Plan at iv.

<sup>21</sup> In its Response to the Tentative Decision filed on October 7, 2013, CLF asserts that the Siting Board erred by taking notice of the Climate Plan without first notifying the parties of its intent to do so, citing G.L. c. 30A, §11(5) and 980 CMR §1.06(7). However, the Climate Plan is not a fact to which the notice requirement applies. The Climate Plan is comparable to a regulation that the GWSA directed the Secretary to adopt. Through the GWSA, the General Court accords legal significance to the Climate Plan. It cannot be rebutted by facts or alternative plans. The Siting Board is directed to consider policies of the Commonwealth like the Climate Plan when it decides petitions pursuant to Sections 69H and 69J¼. Furthermore, the Climate Plan has been referred to and cited by the Siting Board and parties, including CLF, throughout this proceeding.

<sup>22</sup> The Company uses CO<sub>2</sub> as a surrogate for all GHGs since greater than 99.9% of all GHG emissions from the facility on a CO<sub>2</sub>-equivalent basis are CO<sub>2</sub> (Exh. SHR-8, at 5-12).

<sup>23</sup> After the evidentiary hearings, the Company selected the F Class GE technology, with an estimated CO<sub>2</sub> emission rate of 825 lbs/MWh (Exhs. SHR-8-S, at 12; EFSB-G-4-S). The CRA study and all references in this case to CO<sub>2</sub> emissions and reductions are based on the CO<sub>2</sub> emission rate of 842 lbs/MWh. In its October 7, 2013 comments on the TD, citing its draft MassDEP air permit, Footprint proposed an amendment to the TD to clarify that, with duct firing, the CO<sub>2</sub> emission rate would be 895 lbs/MWh rather than the 825 lbs/MWh previously cited in the record (which the Company now contends is the emission rate without duct firing). However, the draft air permit referenced by the Company is not in the record. The Siting Board directs the Company to submit a compliance filing containing the draft air permit and a thorough explanation of the higher emission rates associated with duct firing.

capacity factor – annual CO<sub>2</sub> emissions would be 2,499,564 tons; operation at the projected 80 percent capacity factor would result in approximately two million tons of CO<sub>2</sub> emissions annually (Exhs. SHR-1, at Table 4.2.1.2-1; SHR-11, at 3-2). The Company estimated that it would pay approximately \$4 million annually for Regional Greenhouse Gas Initiative (“RGGI”)<sup>24</sup> allowances, based on recent auction prices in the range of \$2.00 per ton of CO<sub>2</sub> (Exh. SHR-7, at 6-24).<sup>25</sup>

The Company asserts that based on the results of a study performed by Charles River Associates (“CRA”), described below, the facility itself is a GHG mitigation project, reducing CO<sub>2</sub> emissions by some 450,000 tons per year by displacing higher emitting plants on the New England grid (Exh. EFSB-A-11; RR-EFSB-8). The Company also notes that it is in the early stages of discussions with the City regarding a Community Benefits Agreement (“CBA”), and that off-site GHG mitigation could be a component of the CBA (Exh. SHR-7, at 6-37; RR-EFSB-8). Footprint submits that any Siting Board requirements for GHG mitigation in this proceeding should not go beyond the Company’s required participation in RGGI, which it asserts is the key existing strategy in the Climate Plan for reducing emissions from fossil electric generating units (Company Reply Brief at 14). Further, the Company asserts that the proposed project is consistent with the GWSA, as the Climate Plan references the potential replacement of electricity generated from oil and coal at the existing Salem Harbor Station with natural gas-generated electricity to reduce GHG emissions (Tr. 9, at 1645).

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<sup>24</sup> Several states wishing to cooperate in reducing greenhouse gas emissions joined together to form RGGI. In Massachusetts, RGGI is implemented through MassDEP’s CO<sub>2</sub> Budget Trading Regulations at 310 C.M.R. 7.70, which require electric generating units equal to or greater than 25 MW to acquire sufficient CO<sub>2</sub> allowances to cover emissions through a regional auction system (Exh. SHR-7, at 6-24).

<sup>25</sup> On February 7, 2013, the RGGI states issued an Updated Model Rule, which proposes to lower the regional CO<sub>2</sub> emissions cap by 45 percent. The accompanying announcement noted that the new rule is expected to result in increases in prices of CO<sub>2</sub> allowances, with expected increases to approximately \$4 in 2014 (in 2010 dollars) and \$10 in 2020 (in 2010 dollars), per allowance. (see [http://www.rggi.org/docs/PressReleases/PR130207\\_ModelRule.pdf](http://www.rggi.org/docs/PressReleases/PR130207_ModelRule.pdf) ).

e. Emissions Displacement Analysis

The Company commissioned CRA to analyze whether the operation of the proposed facility would result in reduced regional air impacts compared to a base case where the existing Salem Harbor facility is retired and no replacement generating facility would be built (“Analysis of the Impact of Salem Harbor Repowering on New England Air Emissions and Electricity Costs”) (Exh. SHR-RS-2). In performing the resulting production simulation analysis, CRA relied on the General Electric Multi-Area Production Simulation (“GE-MAPS”) model, and a variety of CRA’s own input data and assumptions.

The GE-MAPS assumptions made by CRA include: (1) natural gas and oil prices based on the U.S. Energy Information Administration (“EIA”) Energy Outlook 2012, as updated in April 2012; (2) emission allowance prices for CO<sub>2</sub> (under the RGGI) and for NO<sub>x</sub> and SO<sub>2</sub> (under CAIR and Acid Rain Program regulations) based on CRA’s market assessment; (3) electricity demand growth based on the 2012 ISO-NE forecast;<sup>26</sup> (4) additional renewable generation based on the Renewable Portfolio Standard (“RPS”) requirements for 2020;<sup>27</sup> (5) additional generic generation sources deemed sufficient to meet regional reliability requirements (550 MW of combined cycle in 2023 and 1000 MW of nuclear in 2025); (6) announced generation retirements take place as scheduled; and (7) transmission system upgrades approved by ISO-NE are placed in service (Exhs. SHR-RS-2; EFSB-A-26). The CRA witness concluded that the Footprint facility would operate at high capacity factors throughout the study period (2016-2025), displacing substantial amounts of generation from older, less efficient units, and thereby reducing regional air emissions (Exhs. SHR-RS-1, at 3; EFSB-A-11).

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<sup>26</sup> CRA used a lower penetration rate for energy efficiency measures than the amount estimated in the 2012 Capacity, Energy, Loads, and Transmission (“CELT”) Report prepared by ISO-NE. CRA contended that the amount estimated in the 2012 CELT Report was too aggressive (Exhs. EFSB-A-27; SHR-RS-2).

<sup>27</sup> CRA’s assumed level of renewable generation reflects the New England states’ RPS requirements for 2020 (Exh. EFSB-A-47). CRA assumed that compliance with RPS is sufficient to meet all demand for renewable generation in the region; after 2020, and until there is a regional capacity deficiency, no new renewable resources were added to the analysis (id.).

Using these assumptions, CRA projected that the proposed project would operate approximately at an 80 percent capacity factor (Exh. SHR-RS-3).<sup>28</sup> CRA determined that the proposed project would reduce regional CO<sub>2</sub> emissions by 457,626 tons annually – a decrease of 1.3 percent in New England’s regional CO<sub>2</sub> emissions from electricity generation in the ten-year study period (Exhs. SHR-RS-2, at 1; SHR-8-S at 3-12). For other pollutants, CRA projected that the proposed project would reduce annual average regional emissions by 527 tons of NO<sub>x</sub> (5.9 percent), 1,209 tons of SO<sub>2</sub> (10.4 percent), eleven pounds of mercury (six percent), and 16 tons of PM<sub>2.5</sub> (0.8 percent) (Exhs. SHR-RS-2, at 1; EFSB-A-17).

f. Sulfur Hexafluoride

Sulfur hexafluoride (“SF<sub>6</sub>”) gas is a non-toxic but highly potent GHG.<sup>29</sup> The proposed project requires the use of a total of 198 pounds of SF<sub>6</sub> gas for its six circuit breakers and several circuit switchers, to be located in the new switchyard and plant areas to be constructed by Footprint (Exhs. EFSB-S-14; EFSB-S-16). The existing Salem Harbor Substation, owned by National Grid, currently has 128 pounds of SF<sub>6</sub> gas; the installation of upgrades to the substation, by National Grid, is anticipated to require an additional 972 pounds of SF<sub>6</sub> gas (Exh. EFSB-S-16). Therefore, the total SF<sub>6</sub> to be used on site is approximately 1,300 pounds, the majority of which will be associated with the Salem Harbor Substation owned and operated by National Grid. National Grid’s procurement standards require that all of its circuit breakers have a leakage rate of less than 0.5 percent a year, and Footprint’s specifications for its new switchyard will be similar to this standard (Exh. EFSB-S-14). The Company plans to “adopt, if possible,” the strategies used by National Grid in its operating procedures for containment of SF<sub>6</sub>, including

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<sup>28</sup> The CRA analysis concluded that the proposed facility would operate at approximately an 81 percent capacity factor up to the middle of 2023 (Exh. EFSB-A-50). After that point, the results show a slightly lower capacity utilization of 79 percent in 2024 and 72 percent in 2025 (Exhs. EFSB-A-50; SHR-RS-2, at 3).

<sup>29</sup> One pound of SF<sub>6</sub> is considered to have the same global warming impact as eleven tons of CO<sub>2</sub>. New England Power Company/Western Massachusetts Power Company, EFSB 10-1/D.P.U. 10-107/10-108 (2012) at 63, citing Massachusetts Clean Energy and Climate Plan for 2020, at 77.

specifications for minimal SF<sub>6</sub> leakage rates and appropriate inspection, monitoring, safety, and handling standards (id. at 3).<sup>30</sup>

g. Intervenors' Positions

CLF asserts that adding significant new sources of GHG emissions is at odds with meeting the GWSA targets (CLF Brief at 14). With respect to Footprint's assessment that the project would reduce the regional power grid's GHG emissions by 1.3 percent, CLF suggested that this reduction is inadequate and also uncertain (id. at 16). CLF argues that in order to comply with the GWSA, the Company should have provided GHG emissions modeling for the full lifetime of the facility, instead of only for the first ten years of operations (CLF Brief at 9; CLF Reply Brief at 5). Further, CLF asserts that the CRA Study is flawed, undercutting the Company's claim that the facility would reduce system-wide emissions (CLF Brief at 15). CLF contends that: (1) the study lacks a sensitivity analysis; (2) does not consider all of the potential transmission system upgrades for the ten-year study period; (3) incorrectly assumes a 365-day supply of natural gas; (4) fails to account for 8,300 MW of mostly coal and oil-fired generation that ISO-NE has characterized as being at risk of retirement by 2030; and (5) understates the amount of future regional energy efficiency and demand response (id. at 15-16; Exh. CLF-2).

The HDSNA/PNA claims that there would be continued health risks and environmental damage to the neighborhoods from "toxic emissions" from the proposed new facility that would not occur if Salem Harbor were decommissioned and a replacement plant not built (HDSNA/PNA Brief at 2, 3). The HDSNA/PNA indicated that its number one concern is health and safety, and that the proposed 230-foot stack height would exacerbate health impacts in the Derby Street neighborhood (HDSNA/PNA Brief at 2).

h. Analysis and Findings

With respect to baseline air quality, emissions impacts, and compliance, the record shows that the proposed facility is expected to meet applicable air quality standards, including ambient

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<sup>30</sup> As described in Section IV.B.h, below, the Siting Board requires that Footprint's SF<sub>6</sub> mitigation must be as stringent as strategies used by National Grid.

air standards and new source performance standards. The record shows that the turbines selected by Footprint and the specified emission controls – including an oxidation catalyst for VOCs and CO and water injection and selective catalytic reduction for NO<sub>x</sub> – would be effective in meeting all applicable emission control requirements, and would yield emission rates similar to the most efficient existing fossil units in New England.

Air dispersion modeling studies indicate that emissions from the proposed facility would not cause any significant diminution of local or regional ambient air quality, even when compared to future baseline conditions in which Salem Harbor Station is retired and no replacement facility is built on the site.<sup>31</sup> Although ambient impacts would exceed SILs established for 24-hour PM<sub>2.5</sub> and one-hour NO<sub>2</sub>, (which required the Company to conduct interactive source modeling) the modeling analyses indicate that ambient impacts would not cause an exceedance of the NAAQS. The NAAQS are health-based standards, designed to protect public health without regard to compliance cost. Whitman v. American Trucking Associations, 531 U.S. 457, 465-472, 475-476 (2001). Compliance with the NAAQS provides an assurance that the proposed facility will be protective of public health of area residents. A formal determination on NAAQS compliance will be rendered by MassDEP in its Comprehensive Plan Approval process.

The MassDEP and USEPA will also evaluate compliance with LAER and BACT and the NSR Program as part of the Comprehensive Plan Approval process. Evidence on the record, including Massachusetts Environmental Policy Act (“MEPA”) review, MassDEP’s draft air permits, and the Siting Board’s own TPS criteria review, all indicate that proposed facility’s air emissions are well controlled, and that the proposed facility’s design and anticipated operation are consistent with LAER, BACT and the NSR Program requirements. The Company has already obtained the NO<sub>x</sub> offsets necessary to meet its requirements under the NSR program.<sup>32</sup>

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<sup>31</sup> By design, this analysis does not reflect the significant reductions in local and regional air emissions associated with the retirement of the existing oil- and coal-fired units at Salem Harbor Station and assumes that these units are no longer operating.

<sup>32</sup> Based on a Settlement Agreement with CLF, originally entered into by Dominion Resources and assumed by Footprint, Footprint is unable to obtain and use emission offsets relating to the retirement of the existing Salem Harbor Station units, and must

Footprint has proposed a single 230-foot stack in order to minimize the visual impacts of the proposed project. The Company conducted modeling analyses to determine the extent to which moderate increases in stack height would reduce air quality impacts. For example, an increase in stack height from 230 feet to 250 feet would have only a small effect on air quality through increased dispersion of pollutants. The record shows that increasing the stack height 20 feet above the 230-foot proposed stack height would cost between \$200,000 and \$300,000. In Section IV.E, below, the Siting Board reviews the visual impacts of the proposed project and concludes that the overall visual impacts of the proposed project would be minimized with the shorter stack. The Siting Board finds that the proposed 230-foot stack height would minimize air quality impacts consistent with cost, and would also minimize visual impacts of the proposed project.

The Climate Plan adopts a 2020 statewide GHG emissions limit of 25 percent below 1990 emissions levels. One of the policies set forth in the Climate Plan is reducing SF<sub>6</sub> emissions by 2020 equivalent to a reduction of 0.2 million metric tons of CO<sub>2</sub> from 1990 levels. As part of the Siting Board's mandate to ensure that new energy facilities are consistent with the Commonwealth's current health, environmental protection, and resource use and development policies, the Siting Board reviews the Company's proposed use of SF<sub>6</sub> to ensure that SF<sub>6</sub> emissions are being reduced to the maximum extent possible. Therefore, the Siting Board directs Footprint to ensure that its SF<sub>6</sub> mitigation approach shall be at least as stringent as measures currently used by National Grid. For example, such SF<sub>6</sub> mitigation measures include purchase specifications for circuit breakers that have leakage rates of less than 0.5 percent a year, and appropriate inspection, monitoring, safety, and handling standards. The Siting Board further directs the Company to employ any additional SF<sub>6</sub> mitigation measures to be taken by National Grid in its proposed upgrades to the Salem Harbor Substation, (see Petition of National Grid, EFSB 13-2, a recently filed petition with the Siting Board for the Salem Harbor transmission line).

In addition, the Siting Board finds that it would be prudent to have a comprehensive SF<sub>6</sub> plan that addresses both the Footprint SF<sub>6</sub> emissions and the Salem Harbor Substation SF<sub>6</sub>

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obtain offsets from the market (Exh. EFSB-A-9). This provision provides an environmental benefit.

emissions in order to minimize future SF<sub>6</sub> leakage rates. The Siting Board directs Footprint to consult with National Grid and develop a joint comprehensive SF<sub>6</sub> reduction plan in connection with the anticipated National Grid upgrades to the Salem Harbor Substation. Footprint shall file the joint plan as a compliance filing to the Siting Board prior to operation of the proposed project.

This is the first power plant for which a petition was filed with the Siting Board after the GWSA was enacted in August 2008.<sup>33</sup> In compliance with the GWSA, the Commonwealth has adopted a GHG reduction target of 25 percent below 1990 levels for 2020 and drafted the Climate Plan to establish a roadmap to achieve the 2020 target. The Commonwealth has not yet adopted specific targets for 2030 or 2040, nor has it yet created plans to reach emission limits for those years. The Climate Plan produced by the Secretary of EOEEA includes two hypothetical scenarios for achieving the 2050 limit based on economic modeling (see Section IV of the Climate Plan). Scenario One is based primarily on eliminating the use of fossil fuels and Scenario 2 is based on maximizing efficiency and conservation. Both scenarios are able to achieve the 80 percent reduction target. Scenario One assumes that by 2050 “the state no longer uses any electricity from natural gas, coal or oil.” Therefore, if the Footprint facility were still running by 2050, it would be at odds with this scenario. On the other hand, Scenario Two still includes some highly efficient natural gas generation in 2050. These Scenarios are for illustrative purposes only, and the Climate Plan acknowledges that achieving the 2050 emissions limit will require broad changes in policies, technology, and business practices that are beyond the reach of Massachusetts alone. Nonetheless, Scenario Two indicates that the Climate Plan reflects a plausible modeling scenario in which the proposed project could be operating well into the future and the Commonwealth still able to achieve its legislatively mandated target for 2050.

In the near term, several items in the Climate Plan indicate that at least some electric generation using natural gas can comport with the strategy for achieving the mandated 2020 targets. First, the Climate Plan proposes a Clean Energy Performance Standard (which has not been adopted to date) that could “initially favor cleaner fossil fuels like natural gas, to act as a

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<sup>33</sup> Montgomery Energy Billerica Power Partners, LP, 16 DOMSB 317 (2009) (“Montgomery Power Decision”), Brockton Power Company, LLC, 17 DOMSB 157 (2009) (“Brockton Power Decision”) and Pioneer Valley Energy Center, 17 DOMSB 294 (2009) (“PVEC Decision”), were filed before but decided after the GWSA was enacted.

bridge to a clean energy future” (Climate Plan at 39). Second, the Climate Plan specifically mentions that the existing Salem Harbor Station could be displaced by natural gas-fired power plants (Climate Plan at 44; Exh. SHR-17, at 10-11). Finally, as noted in the Final Environmental Impact Report Certificate pursuant to MEPA, the Secretary determined that the proposed facility would be consistent with the Commonwealth’s GHG policies (Exh. SHR-17, at 13).

As the Commonwealth approaches 2050, owners of the proposed facility will have to comply with evolving regulations promulgated so that Massachusetts meets the legislatively mandated GWSA targets, as well as interim targets set by the Secretary. In considering future petitions for fossil fuel generating facilities in Massachusetts, the Board will continue to ensure that evolving GHG policies and regulations are addressed fully.

While the proposed project will be participating in RGGI, as well as displacing CO<sub>2</sub> and other pollutants from higher-emitting units on the grid, there is some uncertainty about exactly how much regional emissions would be reduced compared to a scenario with no generation on site. For example, as noted above, while GHG emissions in the 2020 timeframe can be reasonably projected, the ability to forecast reductions through 2050 and to reliably quantify impacts and benefits of the proposed project through that timeframe is limited. While there will be some displacement of CO<sub>2</sub> and criteria pollutants caused by the operation of the proposed facility as compared to a scenario with no generation on site, the amount of CO<sub>2</sub> reductions and reductions of other criteria pollutants over that period will vary depending on actual market conditions.

As CLF correctly noted, such market conditions include the availability of gas supplies, the amount of energy efficiency and demand response, unit retirements, and the future development of the regional transmission system. We concur with CLF that the CRA model could have more accurately reflected some of these variables and would also have benefitted from sensitivity cases over the forecast period. However, the Footprint facility would be one of the most efficient fossil units in New England, and would incorporate current BACT/LAER emission controls. Thus, New England fossil units displaced by Footprint in the foreseeable future would yield GHG and criteria pollutant emission reductions on a net basis under any plausible modeling scenario. While the actual levels of emission reductions may vary from those shown by the CRA model, we conclude that the overall trend of reduced emissions is not in

doubt. In addition, as discussed in Section IV.J, below, Footprint and the City intend to enter into a CBA prior to construction that may include additional GHG mitigation measures.

Although the proposed facility does not exceed the NAAQS and is an efficient gas-fired facility, it does exceed SILS for one-hour NO<sub>2</sub> and 24-hour PM<sub>2.5</sub>. These criteria pollutant impacts, however small, are associated with the selection of a stack height that is below GEP and the combustion of natural gas. The Salem Harbor Station coal- and oil-fired facility has operated in the City in some configuration for over 60 years with its attendant impacts, and concerns about those impacts have been noted by the HDSNA/PNA and many members of the public who spoke at the public hearing in Salem or submitted comments. In view of such concerns, and as further mitigation for the proposed facility's emissions, the Siting Board directs the Company to contribute at least \$300,000<sup>34</sup> to the City either through the CBA or another mechanism dedicated to the development of an off-site emission reduction program targeted to GHGs and PM<sub>2.5</sub>, among other air pollutants. Footprint, with the assistance of the City, shall prepare a report detailing the activities that are to be funded by the off-site emissions reduction program, including the costs, timeframes, and anticipated environmental benefits of the identified projects, to be submitted to the Siting Board within one year of operation of the proposed facility.<sup>35</sup>

In view of the above findings, and with the additional mitigation required, the Board concludes that the proposed project is consistent with the GWSA.

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<sup>34</sup> The \$300,000 amount relates to additional costs that would have resulted from the Siting Board requiring a 20-foot increase in the stack height to 250 feet. The Siting Board is requiring a 230-foot stack instead, and reallocating the cost savings to the off-site GHG and PM reduction programs.

<sup>35</sup> The Siting Board notes that it has addressed the issue of GHGs impacts on the environment prior to the development of such state or regional requirements as RGGI and the GWSA. See Southern Energy Kendall, 11 DOMSB 255, 297-299 (2000) (“Southern Energy Kendall Decision”); Nickel Hill Energy LLC, 11 DOMSB 83, at 143-144 (2000) (“Nickel Hill Decision”); Dighton Power Associates, 5 DOMSB 193, 239-240 (1997).

2. Construction Impacts

a. Description

According to MassDEP's Diesel Retrofit Guide, diesel engines produce significant amounts of small solid and liquid particles composed primarily of carbon, which can be inhaled and can pose a significant health risk to humans (Exh. EFSB-2, at 1).<sup>36</sup> MassDEP indicates that reducing PM pollution from all sources, including construction equipment, is important for the health of workers and communities (*id.*). MassDEP has established a Massachusetts Diesel Retrofit Program ("MDRP") that uses contract specifications to require contractors working on state-funded projects to install retrofit pollution controls on their construction equipment engines to reduce PM, VOCs, and CO (*id.* at 1, 4). Since fall 2010, the Siting Board has required that all projects comply with a diesel retrofit condition in order to limit PM emissions associated with construction equipment.<sup>37</sup> See New England Power Company/Western Massachusetts Power Company, EFSB 10-1/D.P.U. 10-107/10-108 (2012) at 66 ("Hampden County Decision"); NSTAR Electric Company, EFSB 10-2/D.P.U. 10-31/10-32 (2012) at 78 ("Lower SEMA Decision"); Western Massachusetts Electric Company, EFSB 08-2/D.P.U. 08-105/08-106 (2010) at 80, 145 ("GSRP Decision"); New England Power Company, EFSB 09-1/D.P.U. 09-52/09-53 (2011) at 41-43, 85 ("Worcester Decision"). This is the first power plant petition that has come before the Board since the diesel retrofit condition has been incorporated in Board decisions.

Footprint has not yet selected a contractor for this project and as such cannot state with certainty the exact equipment to be used for the project (RR-EFSB-4; Tr. 10, at 1718). However, the Company provided an estimated inventory of 38 pieces of non-road construction equipment that could potentially be used for the project and will be more certain in this regard once the facility design has been finalized and the Engineering, Procurement and Construction ("EPC") contractor is selected (RR-EFSB-4). The Company stated that it expected that larger, higher horsepower equipment would be used on a single location project site, such as a generating facility, as compared to a linear project site, such as a transmission project (RR-EFSB-5). The

<sup>36</sup> MassDEP issued a document in January 2008, "Diesel Engine Retrofits in the Construction Industry – A How to Guide."

<sup>37</sup> The Department of Public Utilities has adopted similar requirements for construction projects involved in Section 72 and zoning exemption requests.

Company explained that it does not know now what individual pieces of construction equipment would be available to rent, or whether they would be (or can be made) compliant with the Board's standard diesel retrofit condition (Tr. 10, at 1718; Company Brief at 51).

As a substitute for the diesel retrofit requirement, the Company proposes to comply with five elements of a 1998 MassDEP program known as the Clean Air Construction Initiative ("CACI") (Exh. SHR-1, at 89; Company Brief at 50).<sup>38</sup> Under this program, Footprint would require its contractors to: (1) use low sulfur diesel fuel for all diesel-powered non-road vehicles; (2) meet the applicable non-road standard in 40 CFR 89.112 for all non-road engines (which does not require that older equipment be retrofitted with particulate control devices); (3) limit idling of diesel engines; (4) establish a staging zone for trucks at a work zone where diesel emissions will not be noticeable to the public; and (5) locate construction equipment away from building air intakes and windows (Exh. EFSB-A-35).

The Company maintains that the standard Siting Board diesel retrofit condition is more prescriptive than the requirements in the CACI and asserts that the standard diesel retrofit condition may present availability problems for certain classes of construction equipment to be used on site (Exh. EFSB-A-45). The Company states that it does not want to take on the role of retrofitting equipment in the existing rental market beyond 40 CFR 89.1122 requirements (Tr. 1, at 85). The Company indicates that it is most concerned with the imposition of diesel retrofit requirements for heavy lift rental cranes, since that equipment has limited availability, which could affect scheduling; the Company is also unaware of the extent of experience retrofitting this type of equipment (Tr. 1, at 86; Tr. 10, at 1709-1710). The Company also contends that subjecting an independent power producer to the diesel retrofit condition in construction of a generating facility is different from imposing that condition on a utility, which can recover associated costs through regulated rates (Tr. 10, at 1706). The Company argues that its proposed CACI conditions will be sufficient to minimize the emissions from construction equipment (Company Brief at 51). However, the Company notes that it is willing to commit to use its best efforts in obtaining retrofitted equipment, as available in the market (*id.*; Tr. 10, at 1709, 1717).

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<sup>38</sup> According to the Company, the document describing the CACI Program is no longer available from MassDEP (Exh. EFSB-A-35).

b. Analysis and Findings

The Siting Board is concerned with diesel air emissions caused by construction equipment, especially in a densely developed residential area such as that surrounding the proposed facility. The project will be constructed over a period of 23 months, and there will be additional months for demolition. The CACI program does not address adequately the intent of the Siting Board in developing a diesel retrofit condition to minimize PM emissions associated with construction equipment to the greatest extent possible. The CACI program was developed in 1998, prior to the issuance of the MassDEP 2008 Diesel Retrofit Guide; additionally, documentation of the CACI program report is not even publicly available from MassDEP. The Company acknowledged that there is no difference in air emissions when the same type of equipment is used for either a single site or a linear project (RR-EFSB-5). In fact, a number of the transmission projects for which the Siting Board required diesel retrofit compliance have also included the construction of large substations as well as linear construction. Hampden County Decision at 66; Lower SEMA Decision at 78; GSRP Decision at 80, 145.

In earlier decisions, the Siting Board has required documentation of compliance with its diesel retrofit condition, and has not identified any problems or issues with project proponents installing the required retrofits. However, as noted above, Footprint expresses concern with the potential unavailability of certain types of equipment. Given that: (1) the EPC contractor has not yet been selected; (2) the specific pieces of equipment have not been identified; and (3) the Company or its consultants have not developed or worked on a project where diesel retrofits were required, the Siting Board concludes that these concerns lack a factual foundation. More importantly, the diesel retrofit condition states that it applies to equipment used for 30 days or more, which may exclude certain types of equipment that are of concern to the Company. In addition, the diesel retrofit devices must be commercially available, which addresses a key reservation voiced by the Company about the diesel retrofit requirement of the Siting Board. Finally, while the Company has also committed to using ultra-low sulfur diesel fuel in its construction equipment and limiting vehicle idling to no more than five minutes, these are already requirements that the Company must undertake under existing federal and state regulations, and therefore, such actions do not constitute additional mitigation.

The record is sufficient to convince the Siting Board that its now-standard diesel retrofit condition is warranted for the construction of the proposed facility. Accordingly, the Siting

Board directs that all diesel-powered non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of project construction have USEPA-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies (to the extent that they are commercially available) installed on the exhaust system side of the diesel combustion engine. Prior to the commencement of construction, the Company shall submit to the Siting Board certification of compliance with this condition and a list of retrofitted equipment, including type of equipment, make/model, model year, engine horsepower, and the type of emission control technology installed.<sup>39</sup>

Accordingly, the Siting Board finds that, with implementation of the above conditions for both operational and construction air impacts, the air quality impacts of the proposed facility would be minimized.

### C. Water

In this section, the Siting Board addresses the water-related impacts of the proposed facility including water and wastewater impacts, stormwater issues, wetlands and coastal zone impacts, and sea level rise issues.

#### 1. Water and Wastewater Issues

##### a. Water Requirements and Water Sources

Footprint indicated that it considered three approaches to cooling – once-through cooling, wet cooling, and air cooling – before selecting air cooling (Exh. SHR-1, at 90). The Company stated that, at the peak summer design conditions, once-through cooling results in the highest plant efficiency, with wet cooling being about 2.5 percent less efficient and air cooling about five percent less efficient (Exh. EFSB-W-3). At cooler air temperatures of 60°F, the efficiency penalty for air cooling is significantly reduced to just one percent and 1.5 percent, respectively, compared with wet cooling and once-through cooling (*id.*). Despite the potential gains in

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<sup>39</sup> The Siting Board notes the Company's additional argument about the difference between rate-regulated transmission providers and competitive power generators, and their respective abilities to sustain added costs for diesel retrofits. We are not convinced that the balance between minimizing environmental impacts and minimizing the cost of mitigation should be different depending on whether ratepayers or investors bear the cost of environmental mitigation.

efficiency, the Company stated that it rejected once-through cooling based on environmental impacts, namely, thermal impacts from the discharge of heated water, impingement impacts from the entrapment and death of large marine organisms on cooling system intake screens, and entrainment impacts from the death of small plants and animals that pass through the intake into the plant (Exh. EFSB-W-2). Additionally, the Company stated that once-through cooling poses a substantial permitting risk due to a history of opposition by environmental groups and stringent USEPA requirements (Exh. EFSB-W-4-1).

Footprint stated that wet cooling would avoid many of the adverse environmental impacts of, and would use much less water in total than, once-through cooling. The Company also stated that the proposed facility would require approximately 2.7 million gallons per day (“gpd”) for wet cooling, most of which would be lost to evaporation, with no direct discharge to the harbor, whereas the existing plant discharges 359 million gpd when it is operating at full capacity (Exhs. EFSB-W-3; EFSB-W-24). According to the Company, wet cooling requires more noise mitigation than once-through cooling, but less noise mitigation than air cooling (Exh. EFSB-W-3). The Company stated that potential water sources for wet cooling are seawater, municipal water, and treated effluent from the SESD facility (Exh. EFSB-W-4). The Company stated that the use of seawater would result in impingement and entrainment impacts, while the use of municipal water would be expensive and difficult for technical and regulatory reasons (*id.*). The Company stated that the effluent from SESD would require further treatment to be used in the cooling system, and even then, the cooling system would require upgrades (*id.*). Footprint further noted that SESD indicated that it would not be in a position to reliably support the Company’s needs for wet cooling make-up water from an operational or timing perspective (*id.*). According to the Company, determining factors in selecting air cooling over wet cooling were the lack of an appropriate water supply and the desire to avoid fogging and the dispersion of airborne materials from the cooling tower (*id.*; Tr. 7, at 1206).

The Company stated that by selecting air-cooled condensers, the facility requires no water for the primary condenser cooling, only for auxiliary equipment cooling (Exh. EFSB-W-4-1). Footprint indicated that the heat load for auxiliary equipment is primarily for cooling lubricating oils (*id.*). The Company indicated that it intends to use a small wet evaporative cooling tower for this function, instead of a system of individual air fan-cooled radiators, in order to reduce costs, parasitic energy loads, and noise emissions, as well as to

achieve better lubrication temperatures at peak summer conditions (id.). Footprint asserted that the cooling tower would be visually and acoustically shielded by the berm, but that it may produce a small plume of fog under certain weather conditions (Tr. 7, at 1215).

With the selection of air cooling, Footprint stated its proposed facility would require an average of approximately 238,500 gpd of water<sup>40</sup> and a peak demand of 294,500 gpd, including the demand related to auxiliary equipment cooling, replacement of HRSG blow down, miscellaneous steam losses, the reverse osmosis reject stream, and potable water (Exh. SHR-7, at 6-67). The two biggest water demands are for HRSG blow down and the reverse osmosis reject steam, which together would account for more than 60 percent of the average daily demand (id.). The Company stated that an on-site treatment would involve filtration and chemical dosing to achieve water characteristics necessary for proper operation of the facility's process equipment (Exh. SHR-1, at 91). The Company indicated that the water treatment area would include a 200,000-gallon demineralized water tank and a 500,000-gallon raw water tank that would serve as the reserve capacity for process water, as well as a fire water storage tank, subject to final design administrative approvals (id.).

The Company stated that its primary plan to meet all its water needs is to use the Salem municipal system, which is supplied by the Salem and Beverly Water Supply Board ("WSB") (Tr. 7, at 1220, 1228). Footprint testified that the existing power plant used an average of approximately 393,500 gpd of water in 2012 from the WSB in addition to the seawater it used for once-through cooling, whereas the proposed plant would use an average of 238,500 gpd from the WSB (Exh. SHR-7, at 6-67; Tr. 7, at 1226).

The WSB withdraws water from the Ipswich River and a four billion gallon reservoir system. The capacity of the reservoir system exceeded the WSB's annual usage for the years 2009 through 2012 (Exhs. SHR-1, at 92; EFSB-W-36-S). The Ipswich River basin frequently experiences low water conditions during the summer months (Exh. EFSB-W-25). The Company stated that the WSB only pumps water from the Ipswich River from December 1 through May 31 and relies on the reservoir system during the remainder of the year (Exh. EFSB-W-9). Footprint provided a letter from the WSB indicating that the proposed project would use less water than

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<sup>40</sup> The 238,500 gpd required with use of ACCs at the proposed facility represents approximately 8.8 percent and 0.066 percent, respectively, of the average daily water required for a wet-cooled facility or a once-through cooled facility.

the existing facility, and that the WSB expects to be able to meet the entire estimated needs of the project while continuing to supply the City system with potable water (Exh. EFSB-W-27-1).

The Company testified that it is also in discussions with SESD about the potential for using the effluent from SESD for the process water needs of the proposed facility (Tr. 7, at 1217). Footprint stated that it is conducting a year-long analysis of the effluent from the SESD facility to determine whether it would be appropriate for use in the proposed facility, specifically whether the filtration of suspended solids and other chemical components found in the effluent would result in process water that would damage the Footprint equipment (id. at 1218). The Company stated that even if it were able to use the effluent from SESD for its process water demands, its potable water demands – which would constitute less than two percent of its average water use – would be met with supplies from the WSB (Exh. SHR-7, at 6-67; Tr. 7, at 1222).

b. Wastewater Discharge

The Company stated that the facility will generate both process wastewater and sanitary sewage, both of which will be discharged to the adjacent SESD treatment facility (Exh. SHR-1, at 93). The SESD treatment facility is a secondary wastewater treatment plant that serves Beverly, Danvers, Marblehead, Middleton, Peabody, and Salem, with a design flow of 29.71 million gpd and an average flow of 27 million gpd (id.). The Company indicated that it would discharge an average of 186,624 gpd and a peak of 210,960 gpd to the SESD (Exh. SHR-7, at 6-69). Footprint provided a letter from SESD that stated that its treatment plant could accommodate the expected discharge rates (Exh. EFSB-W-12-1). Footprint indicated that the proposed facility requires an Industrial Sewer User Permit from MassDEP (Exh. SHR-1, at 93).

2. Stormwater Issues

Footprint testified that in order to minimize environmental impacts during construction, a detailed Stormwater Pollution Prevention Plan (“SWPPP”) would be prepared in accordance with USEPA regulations (Exh. SHR-11, at 8-8). The Company explained that measures to manage storm water, minimize erosion, and control sediment would include: (1) tree protection;

(2) perimeter controls such as a silt fence; (3) measures to control discharges from sediment or soil stockpiles; and (4) the minimization of dust (id. at 8-8 to 8-12).

The Company proposed four distinct management districts in its long-term drainage and stormwater management system: (1) the facilities area inside of the berm; (2) the existing parking area and access roadway; (3) the landscaped area; and (4) the remaining undeveloped area to the north and south of the proposed facility (id. at 8-1). The first area (the area within the berm) would include a pervious layer of clean washed stone underlain with filter fabric in all areas not occupied by buildings, the access road, and supporting facilities. The Company stated that roof runoff from the buildings that make up the proposed facility would be directed to a subsurface 30,000-cubic-foot stormwater vault to be used for landscape irrigation (id.).

Footprint indicated that runoff from the other surfaces in the area within the berm will be collected in a series of catch basins, routed through water quality structures, conveyed to a new tide gate structure, and discharged to Salem Harbor through an existing discharge outfall (id.). Footprint stated that runoff from the second area (the existing parking area to the north of the proposed facility and access roadway) would be routed through an upgraded series of catch basins and water quality structures before it is conveyed to a new tide gate structure and discharged to Salem Harbor through the existing discharge channel (id. at 8-2). The Company stated that in the third area (the landscaped area including the berm and the green roof of the Administration Building) there will be some infiltration (id. at 8-4). Footprint proposed a series of drop inlets located on both sides of the paths in the landscaped area to direct runoff to a new drain line that will enter the existing discharge channel (id. at 8-2 to 8-3). The Company stated that, as an interim measure, runoff in the fourth area would be directed to a new drainage structure for the northern portion and to the existing spillway in the southern portion (id. at 8-3).

Footprint asserted that its proposed stormwater plan is consistent with the MassDEP Stormwater Management Standards enumerated in 310 C.M.R. 10.05(6)(k) through (q) (id. at 8-4). Specifically, the Company claimed that post-development discharge rates will not exceed discharge rates associated with the existing facility and that following the completion of facility construction its storm water management systems would be designed to remove at least 80 percent of the average annual load of total suspended solids in stormwater (id. at 8-4 to 8-8).

### 3. Wetlands and Coastal Zone Issues

The Company stated that there would be no impacts to vegetated wetlands or federally regulated wetlands (Exh. SHR-1, at 94). Footprint indicated that the project would result in temporary and permanent impacts for portions of the parcel identified as Land Subject to Coastal Storm Flowage (“LSCSF”) under the Massachusetts Wetlands Protection Act (Exh. SHR-11, at 7-2 and 7-3). On the project parcel, LSCSF is coincident with the limits of the 100-year floodplain as mapped by the Federal Emergency Management Agency (“FEMA”) (*id.* at 7-2). Footprint indicated that the City’s Wetlands Protection and Conservation Ordinance generally adopts the Massachusetts Wetlands Protection Act, but extends its jurisdiction 100 feet further inland than the state-designated LSCSF (*id.* at 7-2). Footprint stated that demolition and construction activities would occur within areas regulated by these state regulations and local ordinances (*id.*). Approximately 17 acres of LSCSF will be temporarily occupied by construction activity, and approximately 8.5 acres of LSCSF will be permanently elevated with fill above the floodplain and expected sea level rise (*id.* at 7-2 and 7-3). Footprint indicated that there is no need for compensatory flood storage or mitigation since the project is located in a coastal area open to the ocean and there will be no permanent alteration to areas within the velocity zone<sup>41</sup> boundaries, so that the project’s alterations will not result in the redirection of storm waves to adjacent properties so as to cause flood damage (Exhs. SHR-1, at 97; EFSB-W-33). The Company stated that minor grading would occur on the remaining land (Exh. SHR-11, at 7-3). The Company committed that construction laydown would not occur within a 100-foot buffer of the coastal bank (Tr. 7, at 1204). On June 13, 2013, Footprint filed a Notice of Intent to alter land regulated under the Massachusetts Wetlands Protection Act with the Salem Conservation Commission, and on July 31, 2013, the Conservation Commission issued an Order of Conditions allowing the proposed project to go forward (Exh. EFSB-LU-5-3).

Footprint stated that the project site is located in a DPA on filled tidelands and is subject to Chapter 91 waterways regulations (Exh. SHR-1, at 98, 101). Chapter 91 requires all structures and uses located in tidelands to obtain a Waterways License from MassDEP (*id.* at 98).

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<sup>41</sup> Areas mapped as being subject to additional hazards in a 100-year storm beyond inundation, due to storm-induced velocity wave action, are identified by FEMA as velocity zones.

Footprint stated that according to Chapter 91 regulations, all structures in DPAs must be either water-dependent industrial uses, accessory uses, or a limited category of supporting uses (id. at 101). The Company indicated that based on discussions with MassDEP staff, it would apply for a variance from Section 9.32 of the Waterways Regulations (310 C.M.R. 9.32(1)(b)), which restricts fill and structures in DPAs to marine industrial uses. However, the Company maintains that the proposed project constitutes a marine industrial, water-dependent use of the property (Exh. SHR-11, at 6-1; Tr. 6, at 1044-1047). The Company stated that it will also seek a variance from the Waterways Regulation, which requires conformance with the Municipal Harbor Plan and consistency with Coastal Zone Management policies (Exh. SHR-11, at 6-1).

#### 4. Sea Level Rise

The GWSA amended G.L. c. 30, § 61 to require the consideration of “reasonably foreseeable climate change impacts...and effects, such as predicted sea level rise” under MEPA. The Company conducted an analysis of the combined impacts of storm surge and sea level rise (Exh. SHR-7, at Appendix E). Footprint stated that to estimate sea level rise over the projected life of the facility it relied on a compilation of multiple global sea level rise predictions. The Company used 40 percent (prorated for the proposed facility’s approximate design life) of the averaged sea level rise estimate for the year 2100 from these various models to derive its sea level rise estimate (id. at 6-61 and Appendix E).<sup>42</sup> Footprint’s assumptions for storm surge and sea level rise are summarized in Table 4, below:

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<sup>42</sup> The Company’s expected life of the proposed facility, with possible extensions, is 40 years. The models all predicted sea level rise through 2100, which for most of the models represents approximately 100 years into the future (Exh. SHR-7, Appendix E).

**Table 4. Footprint's Design Criteria for Storm Surge and Sea Level Rise**

| <b>Factor Requiring Additional Height Above Mean Sea Level</b> | <b>Elevation Requirement (Feet)</b> |
|--|-------------------------------------|
| Tidal Range (Mean High Water)                                  | 4.60                                |
| Storm Surge  | 8.00                                |
| Added for Wave Height in a Storm                               | 2.00                                |
| Sea Level Rise (40 years)                                      | 1.25                                |
| <b>Total Elevation Requirement</b>                             | <b>15.85</b>                        |
| <b>Footprint Selected Grade</b>                                | <b>16.00</b>                        |

Source: Exh. SHR-7, at 6-61 and Appendix E

Footprint stated that existing grades throughout the site range from approximately nine to 16 feet above mean sea level (Exh. SHR-7, at Appendix E). The Company stated that equipment foundations, the floors of all new buildings, and the crowns of roadways would have an elevation of 16.0 feet above current mean sea level (Exh. SHR-11, at 3-5). The Company also stated that all potentially hazardous materials would be stored at elevations at or above 16.0 feet (Exh. SHR-11, at 3-5). The Company noted that the FEMA 100-year flood elevation for the site is ten feet (Exh. SHR-7, Appendix E).

#### 5. Intervenors' Positions

In the proceeding, the City initially advocated that Footprint install a stormwater pump station on its property to handle site drainage and help alleviate neighborhood flooding on Emerton and Forrester Streets (Exh. S-1, at 22). During the hearings, the City acknowledged that stormwater drainage from the power plant parcel had been disconnected in 1992 from the City's drainage pipe that runs underneath the parcel (Tr. 10, at 1653-1656). The City further acknowledged that there would not be any interaction between the drainage from the southern part of the site and any current flooding in the adjacent neighborhood (id.).<sup>43</sup>

The City advocates that the Company should pay for a commercial contractor to perform ice breaking services to keep the port of Salem open during periods of extreme inclement

<sup>43</sup> As a condition of the City of Salem's Planning Board approval, Footprint is required to relocate a portion of the City's drain line currently located on the site in coordination with the City Engineer. The Company is also directed to work with the City to set aside a permanent easement on the site of no greater than 5,000 square feet if the City decides to build a pump station in order to alleviate flooding in the adjacent neighborhood (Exh. EFSB-LU-5-2, at 11).

weather (Salem Brief at 17). The City notes that although the cessation of the existing plant's heated water discharge from once-through cooling will provide an environmental benefit, it will also result in an increased need for the City to perform ice breaking in the area in order to maintain winter marine traffic (Exh. S-1).

CLF argues that assessing the potential for sea level rise at the site is critical to complying with the GWSA and that Footprint's assessment is critically flawed. Specifically, CLF argues that Footprint's analysis failed to account for any regional differences in sea level rise since it used a global rate of sea level rise (CLF Brief at 12).

In supporting its argument that the project is inconsistent with applicable policies concerning tidelands and DPAs, CLF states that it is "abundantly clear" that a coastal location is not necessary for the type of facility that the Company has proposed (*id.* at 20). As described above in Section II, CLF also asserts that insufficient information was provided regarding alternative upland sites (*id.*). CLF contends that the Company has failed to provide sufficient evidence that the Project warrants a variance by MassDEP from the requirement to locate a water-dependent use in a DPA, noting that variances are rarely issued (*id.* at 11). CLF uses these Chapter 91 concerns to argue that the Board should reject the Petition on the grounds that it is not consistent with the environmental protection policies of the Commonwealth (*id.*).

## 6. Analysis and Findings

The record indicates that the Company considered once-through cooling, wet cooling and air cooling for the facility's primary cooling needs. The record indicates the proposed facility would be primarily air cooled, relying on wet cooling only for auxiliary equipment. Once-through cooling would have been the most efficient technology, thereby resulting in the lowest air emissions per MWh. However, the Company's decision to pursue air cooling versus once-through cooling provides an environmental benefit to Salem Harbor by reducing thermal impacts, impingement, and entrainment. Additionally, the Siting Board concurs with the Company that once-through cooling would be the most difficult technology to get permitted. The record indicates that the Company opted against wet cooling due to lack of an appropriate water supply, to avoid fogging, and to reduce the dispersion of airborne materials. Air cooling requires no water for the facility's primary cooling load. Although air cooling would increase noise impacts compared to the other two methods, in Section IV.F, below, the Board finds that

the Company is able to minimize noise impacts resulting from air cooling. As such, the Board concludes that, on balance, air cooling technology minimizes overall environmental impacts associated with cooling the proposed facility.

The proposed facility would require an average of approximately 238,500 gpd of water and a peak demand of 294,500 gpd. The primary proposed water source is the WSB, which has indicated that it anticipates being able to meet this need. The WSB draws its water from the Ipswich River, but relies on a series of reservoirs during low-flow seasons to avoid withdrawals from the Ipswich River. The record indicates that the Company is in the process of investigating the potential to use effluent from the SESD to serve the plant's process water demand. The Board concludes that water supply impacts would be minimal with either the WSB or SESD as the water source.

The Board declines to require the Company to pay for new costs associated with ice breaking. However, the Company and the City may choose to enter into an agreement on this issue.

The record shows that the proposed facility would discharge an average of 186,624 gpd and a peak of 210,960 gpd of wastewater to the SESD. SESD can accommodate the expected discharge rates. The proposed facility requires an Industrial Sewer User Permit from MassDEP.

The record shows that Footprint has proposed a drainage and stormwater management system that would be in compliance with MassDEP Stormwater Management standards. The Company would install a series of systems to treat the runoff from the facility area inside the berm, and also treat the runoff from the existing parking and access roadway before it is conveyed to a new tide gate structure and discharged to Salem Harbor. Additionally, runoff from the roofs in the proposed facility would be collected and stored in a 30,000-cubic-foot stormwater vault and used for landscape irrigation. Runoff from the landscaped areas would either infiltrate into site soil or enter a series of drop inlets adjacent to the paths to be conveyed to Salem Harbor.

The record indicates that the project would create temporary impacts on wetland and coastal resources from construction and demolition activities and would permanently regrade approximately 8.5 acres of existing LSCSF above the elevation subject to storm flow.

Footprint will seek a variance from the Waterways Regulations that restricts fill and structure in DPAs to marine industrial uses. The Siting Board precedent in cases involving

Chapter 91 and DPAs has been to require petitioners to fully describe how they comply with these requirements. The Board has not previously made any determinations regarding whether a project is water dependent or complies with Chapter 91, but instead noted that such a review is the role of MassDEP.<sup>44</sup>

The record indicates that Footprint has analyzed the risk of sea level rise to the proposed facility. The elevation for the proposed facility is six feet above the FEMA 100-year flood elevation. The Siting Board finds that Footprint has taken reasonable measures to mitigate against the risk of sea level rise to the proposed facility. As the proposed facility is the first power plant case to come before the Siting Board since the enactment of the GWSA, there is no Board precedent on sea level rise planning standards. State agencies including EOEEA, MassDEP, and CZM are currently in the process of studying the need for changes in the Chapter 91 regulations based on the GWSA (July 11, 2013, EFSB Meeting Tr. at 180-181). The resulting changes to Chapter 91 regulations or other newly developed state policies may be applicable to future petitions.

Accordingly, the Siting Board finds that the water related impacts of the proposed facility would be minimized.

#### D. Hazardous and Solid Waste

The following section addresses solid and hazardous waste resulting from site demolition and remediation, as well as from the project's construction and operations.

##### 1. Description

Footprint has publicly committed to the community, the Salem Harbor Plant Revitalization Task Force, and the City's Power Plant Redevelopment Advisory Group ("stakeholder group") that it will demolish all the above-ground structures on the entire 65-acre parcel that are not going to be reused, a commitment that was reiterated during its testimony in

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<sup>44</sup> See Cape Wind Associates, LLC, 15 DOMSB 1 (2005), where the project proponents were applying for a variance under Chapter 91.

this proceeding (Tr. 7, at 1264-1265).<sup>45</sup> The Company stated that the demolition scope includes: three smoke stacks, eleven oil tanks and secondary containment elements, the coal pile, the coal pile runoff pond, the coal conveyor, the subsurface coal tunnel, three bottom ash settling basins, two ash silos, four electrostatic precipitators, the induced draft fan building, five warehouses, the boiler structure and internals, and the screen house/intake structure (Exh. EFSB-HW-7). Footprint indicated that the existing guard house and community relations buildings would be reused in place, and structural elements of the existing turbine building may be reused in place if an appropriate tenant is found (Tr. 5, at 879-882; Tr. 7, at 1279).

Before demolition begins, Footprint committed that it will abate any material containing asbestos and dispose of the material at a licensed asbestos landfill, as well as abate other hazardous materials including lead and polychlorinated biphenyls (“PCBs”) (Exh. EFSB-HW-8; Tr. 5, at 883). The Company hired a consultant who completed a survey of asbestos-containing materials and other hazardous materials on the parcel that will serve as the basis for contracting the abatement work (Exh. SHR-18, at 1; Tr. 5, at 935). The Company stated that, at the same time that abatement is occurring, it would evaluate existing brick and concrete materials for potential reuse on-site, including seeking a beneficial use determination from MassDEP in order to potentially reuse coated materials based on the environmental suitability of such use (Tr. 5, at 884-885). The Company stated that it would attempt to maximize salvage and recycling for the remaining demolition waste although it has not yet set specific targets (*id.* at 889, 942).

At the same time as the Company begins demolition, it will also begin to remediate the parcel. According to the Company, it is committed to remediating the entire 65-acre parcel, with the exception of the National Grid substation (*id.* at 927; RR-EFSB-35). The MCP provides a regulatory framework for the phased approach to management and mitigation of risks posed by

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<sup>45</sup> The Salem Harbor Plant Revitalization Task Force was established by legislation to implement a plan, adopt rules and regulations and recommend necessary legislative action to ensure the full deconstruction, remediation and redevelopment or repowering of the Salem Harbor Power Station by December 31, 2016 (Acts of 2012, c. 209, § 42). The Power Plant Redevelopment Advisory Group is a 13-member board convened by the City comprised of elected representatives, representatives from the neighborhood, environmental groups, Salem State University, and other stakeholders to serve as a clearing house for issues, concerns, and opportunities related to the redevelopment of the power plant site (RR-EFSB-54).

the releases of hazardous materials to the soil or groundwater (Exh. SHR-11, at 9-2). The Company stated that there had been 18 prior releases of oil and hazardous materials that were assigned Release Tracking Numbers (“RTNs”) under the MCP (Exh. EFSB-HW-14-2, at i). The Company stated that all of these RTNs have been closed, with permanent solutions specified under the MCP (id.).<sup>46</sup>

In early 2013, Footprint completed a subsurface investigation that characterized the current conditions of the entire 65-acre site with the exception of the National Grid substation (Tr. 5, at 891). Footprint asserted that it voluntarily conducted the site characterization with the express intention of discovering impacted areas in order to undertake remediation (Exh. EFSB-LU-2). The Company described its assessment of soil and groundwater contamination by sampling from 78 soil borings, 25 groundwater monitoring wells, and 40 shallow test pits in order to evaluate current site conditions (Exh. EFSB-HW-14-2-3, at i). The Company claimed that overall site contamination largely matched its expectations based on past release tracking numbers associated with the site and its historical uses (Exh. EFSB-HW-14-2, at ii). The investigation identified several conditions requiring reporting to MassDEP under the MCP within 120 days of discovery (“120-day reportable conditions”), including elevated levels of naphthalene, lead, nickel, and vanadium in the soil, which the Company submitted to the MassDEP on January 10, 2013 (Exhs. EFSB-HW-14-1; EFSB-HW-14-2, at ii). The Company stated that no asbestos was found in any of the soil samples and none of the targeted compounds were detected above applicable MCP reporting levels in the groundwater (Exh. EFSB-HW-14-2, at ii).

Footprint stated that because it submitted new reportable conditions under the MCP, it is now responsible for doing further site investigation, submitting a Remedy Implementation Plan, and ultimately implementing a Response Action Outcome under MassDEP rules (Tr. 5, at

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<sup>46</sup> The Company stated that all RTNs have achieved regulatory closure, with one Activity and Use Limitation (“AUL”) in an area where four unlined wastewater treatment systems were in use from 1968 through 2001 (Exh. EFSB-HW-14-2, at 3). The AUL prohibits the use of that area as a residence, school, nursery, daycare facility or non-industrial use, and requires specific soil management plans and health and safety plans for construction activity (Exhs. EFSB-HW-11; EFSB-HW-14-2-3). The area governed by the AUL would be part of the site for proposed facility and so would be covered by additional clean fill (Tr. 5, at 909).

892-893). Footprint testified that MassDEP will be more directly involved in the MCP process for the parcel than is typical (*id.* at 908). Footprint's consultants testified that the Company asked them to go beyond the minimum that is required by the MCP (*id.* at 901-02, 917).<sup>47</sup> However, Footprint now argues that requiring the Company to meet accelerated deadlines for the MCP process imposes an unnecessary burden on the Company since it is already legally required to complete the entire process and the costs for accelerating the process are unknown (July 11, 2013, EFSB Meeting Tr. at 72).

The Company stated that specific remediation measures would be developed in accordance with the MCP and would likely include controls that limit physical access to specific areas within the site, as well as removal of a limited amount of soil (Exh. EFSB-HW-12; Tr. 5, at 898-907). Footprint stated that early demolition and remediation work could begin as soon as the winter of 2013/2014 (Tr. 5, at 883). The Company testified that it has not yet identified a receiving facility for any soils that may be removed from the site as part of the remediation effort, but stated that its preference would be to transport these soils off the site by sea (*id.* at 911-912). The Company stated that any soil removal to occur on the parcel would occur in the same time span as the demolition, remediation, and construction described in this petition (*i.e.*, the Company would not wait until the remainder of the parcel was actually scheduled for redevelopment) (*id.* at 938-939). The Company argued that its commitments to demolish all existing structures not intended for reuse and to remediate the entire parcel will make the remaining 45 acres more attractive and less expensive to develop for future users (Company Brief at 13-14).<sup>48</sup>

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<sup>47</sup> Footprint's consultants testified that the Company had asked them to do additional investigation into soil removal beyond what is required under the MCP process at several locations where lead was detected at the southwesterly portion of the site and at locations throughout the site where moderate levels of nickel and vanadium were detected (Tr. 5, at 901-902, 917).

<sup>48</sup> A site reuse study prepared for the City of Salem by third-party consultants in January 2012 (*i.e.*, before Footprint had completed its subsurface investigation), estimated that total net demolition and remediation costs for the site would be between \$60 and \$85 million (Exh. SHR-6, at 51). As of the evidentiary hearings, the Company stated that it was still bidding the demolition and remediation work so the final cost was not established. Footprint testified that the \$60 to \$85 million estimate could be viewed as an upper limit (Tr. 5, at 921, 938).

Footprint indicated that it intends to develop a construction waste management plan with a minimum recycling and reuse goal of 50 percent, excluding demolition waste, and that it intends to maximize construction waste reuse and recycling to the extent feasible (Exh. SHR-7, at 5-2; Tr. 5, at 942-943). The Company stated that it would segregate reusable materials such as metal, asphalt, and scrap wood into stockpiles for salvage or on-site reuse; use containment structures around refueling and vehicle maintenance areas; and implement best practices regarding solid waste management, including recycling all non-hazardous waste to the extent practicable (Exh. SHR-1, at 126-127; Tr. 5, at 945). The Company indicated that non-recyclable solid wastes would be transported to a licensed solid waste landfill, and separate containers would be provided for recyclable materials (Exh. SHR-1, at 126-127). The Company explained that recyclable materials would either be picked up by the solid waste disposal contractor or a separate recycling firm (*id.*).

Footprint indicated that the operations of the proposed facility would generate a small amount of solid waste, including recyclable office waste and trash (*id.*). The Company stated that it would develop a recycling plan and place recycling containers around the facility (*id.*). The Company indicated that the Footprint facility would likely generate a small quantity of hazardous waste as a result of equipment maintenance activities, and that the Company is committed to meeting all applicable regulatory provisions for management of hazardous waste under 310 C.M.R. 30 (*id.*; Exh. EFSB-HW-3). The Company confirmed that the Footprint facility will segregate all hazardous waste and follow Massachusetts regulations for its recycling and disposal (Exh. SHR-1, at 127).

The Company maintained that an estimation of future decommissioning costs for the proposed facility was not necessary to meet the statutory standard of review for a § 69J¼ petition because the Board had never previously required it (Company Reply Brief at 6). The Company estimated that the scrap value of the facility is likely to exceed decommissioning costs and that decommissioning the proposed facility would not be as extensive as decommissioning the existing Salem Harbor Station, which requires asbestos abatement and remediating on-site fuel storage (Tr. 5, at 947-948).

## 2. Intervenors' Positions

CLF argues that Footprint's Petition is incomplete regarding the expected costs and detailed requirements of decommissioning and remediating both the existing site and the proposed facility at the end of its useful life (CLF Brief at 12). Specifically, CLF argues that Footprint has not provided relevant information about issues including the amount of asbestos, the cost of remediation, or the specific soil concentrations to which certain areas of the site would be remediated (id. at 13).

CLF asserts that Footprint's commitment to demolish and remediate the site does not represent an environmental benefit because 310 C.M.R. 9.27 of the waterways regulations provides MassDEP with the authority to order the removal of structures upon the expiration of a license issued under G.L. c. 91 (id. at 11). CLF further argues that for remediation, Footprint has only stated that it will comply with the MCP, which would be required of any owner of the site (id. at 11).

The City supports the removal of the existing oil storage tanks so that the acreage currently occupied by the storage tanks can be put to other uses (Salem Brief at 4). Mayor Kimberley Driscoll states that one of the City's biggest fears was that the cost of remediation would preclude redevelopment in a timely manner, and she supports the requirement for the remediation of the entire parcel as part of the proposed project (July 11, 2013, EFSB Meeting Tr. at 22, 34). Mayor Driscoll states that the City also values the opportunity to have a large portion of the parcel available for maritime and port uses after the proposed facility is developed (id. at 23-24).

The HDSNA/PNA questions the proposed project as a sound investment for the City even with its guarantee of demolition and remediation, citing the state mandated taskforce responsible for planning the decommissioning and cleanup of the site (HDSNA/PNA Reply Brief at 3). The HDNSA/PNA supports a bond or some type of insurance to guarantee decommissioning of the proposed facility if it is approved (July 11, 2013, EFSB Meeting Tr. at 102).

### 3. Analysis and Findings

The record shows that Footprint has committed to demolishing all structures and remediating the entire 65-acre parcel in compliance with the MCP process. The Siting Board notes that having the owner of the parcel engage in the MCP process at this time represents a potential benefit to the City by facilitating development of the remaining 45 acres. The Siting Board concludes that it has sufficient evidence to evaluate the decommissioning and remediation plan for the existing Salem Harbor Station. The Board notes that it has never previously examined future decommissioning for proposed projects. In this case, with the current remediation of the entire parcel, no proposed on-site fuel storage, the potential to recover costs through salvage and scrap value, as well as the potential commercial value of the parcel for redevelopment, the record does not demonstrate that future decommissioning would be problematic. The Siting Board concludes that the Company's petition is sufficiently complete on this topic.

The Siting Board directs the Company to demolish all existing structures on the parcel not intended for reuse and to complete the MCP process for the entire 65-acre parcel with the exception of the National Grid substation. Furthermore, the Siting Board directs the Company to complete all demolition work and file a Response Action Outcome Statement or remedy operation status submittal under the MCP process by December 2016.

The record indicates that the Company intends to dispose of all hazardous waste following all local, state, and national requirements. The record also shows that Footprint has committed to reuse and recycle solid and hazardous wastes generated by demolition, construction, and operation of its proposed facility to the extent feasible. Specifically, Footprint has committed to a 50 percent recycling and reuse rate for its construction waste but no firm recycling and reuse rate target for demolition and operations waste. The Siting Board notes that the Company's commitment to recycle, where possible, solid waste from demolition, construction, and operation of the proposed facility contributes to minimizing the solid and hazardous waste impacts of the proposed facility. However, the Siting Board seeks to remain informed regarding the plans and effectiveness of recycling efforts. Therefore, in order to minimize solid waste impacts, the Siting Board directs the Company, prior to the commencement of construction, to provide to the Siting Board a recycling and reuse plan, with targets for demolition and construction waste and its anticipated recycling rate for operational wastes, and

to explain how these targets are consistent with the goals of the Massachusetts 2010-2020 Solid Waste Master Plan produced by MassDEP. The Siting Board further directs the Company to submit a report on the actual demolition and construction waste reuse and recycling rates before operation of the facility and to submit a report on operational recycling rates for the first year of operation of the facility.

As a result of the Company's efforts to remediate the entire parcel, its intentions to maximize recycling and minimize waste, and with the additional requirements set forth above, the amount of waste created by construction and operation of the proposed facility will be reduced to the extent feasible. Accordingly, with the above conditions, the Siting Board finds that hazardous and solid waste impacts of the proposed facility would be minimized.

E. Visual Impacts

1. Description

The new facility would have one stack, which is proposed to be 230 feet tall and 60 feet in diameter (Exhs. SHR-1, at 19; EFSB-V-3). Salem Harbor Station currently has two stacks, one of which is 500 feet tall and tapers from 40 feet to 25 feet in diameter and the other 430 feet tall and 40 feet in diameter; both will be demolished (Exhs. SHR-1, at 130; EFSB-V-3). The main power plant building ("main building") will consist of two components: the turbine section, which will be approximately 45 feet high, and the HRSG section, which will be 125 feet tall (Exhs. EFSB-V-1; EFSB-V-16-1).<sup>49</sup> The proposed configuration of the main building is an "L" shape, which the Company maintained would minimize visual impacts and provide sound attenuation (Exhs. EFSB-V-2; EFSB-SHR-11, at 6-13). The ACC is 120 feet tall (Exhs. EFSB-V-1; EFSB-V-16-1).

The Company provided visual images of the existing and proposed facility from ten viewpoints (Exh. SHR-7, at 6-47 to 6-51). Areas that would have views of the main building as well as the stacks include: the Bentley School, Winter Island, Derby Wharf, Forest River Park, Salem Wharf, Cat Cove, and, from a greater distance, parts of Marblehead (*id.* at Figs. 2-6 to 2-16). With respect to other nearby neighborhoods in Salem, such as the Derby Street and

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<sup>49</sup> The main building measures approximately 73,000 square feet, consisting of the turbine buildings which total approximately 32,000 square feet and the HRSG buildings which total approximately 41,000 square feet (Exh. SHR-11, at 2-1)

Fort Avenue neighborhoods, the new stack would generally be visible, but views of the main building would be blocked or screened at most locations (id.). Footprint asserts that the views of the proposed facility would represent a significant improvement over the views of the existing facility (id. at 6-51).

Footprint maintained that stack height is a particularly sensitive issue for Salem, and it opined that adverse visual impact is generally proportional to stack height. However, the Company also acknowledged that the visual impacts are subjective (Tr. 2, at 382-383; Tr. 7, at 1472; Tr. 9, at 1569, 1579). The Company asserted that a stack height of 230 feet represents an appropriate balance between air emissions impacts and visual impacts (Company Brief at 47, 48; see Section IV.B, above). The Company also indicated that it would prefer to maintain 230 feet as the proposed stack height, rather than increasing it, in order to conform to commitments it has made in its various public presentations (Tr. 2, at 385).

Footprint detailed three forms of mitigation it has incorporated into the design of the proposed project to minimize visual impacts: the facility layout and placement, the design of the main building and the creation of a landscaped berm around the facility with additional site landscaping.

The Company asserted that the “L” shaped configuration of the main building results in over 50 percent of the stack being screened by the main building from most directions (Exh. SHR-11, Appendix B at 25). According to the Company, this configuration allows Footprint to orient the lowest portion of the facility to the residential neighborhood reducing the apparent size of the facility from the closer vantage (Tr. 9, at 1553). The configuration also allows the ACC to be located to the east side of the site, minimizing visual impacts of the ACC on the nearest residential neighborhoods (id.). The Company proposes to enclose the main building and ACCs with some form of cladding (Exhs. EFSB-V-6). Specifically, it favors the use of louvers surrounding the main building enclosure and the ACCs, which the Company characterized as emulating the clapboards and louvered shutters of historic buildings in older sections of Salem (Exh. SHR-11, Appendix B at 26; Tr. 9, at 1557-1559, 1596-1598). The Company stated that it will present its selection of architectural elements such as color and siding materials to the community for its input, prior to finalizing its design (Exh. SHR-11, Appendix B at 26; Company Brief at 81).

Footprint proposed to provide landscaping on approximately seven acres of the 20-acre site, which would include the landscaped berm (Exh. SHR-11, at 6-13).<sup>50</sup> The Company pointed out that the placement of a landscaped berm serves to reduce the visible height of the main building (*id.*). The berm wraps around the facility on three sides, with a peak height of 25 feet on the western and southern sides of the site, and 15 feet on the eastern side (Exhs. EFSB-V-5; EFSB-V-6). Groups of trees would be placed along the top of the berm, adding an additional 30 to 40 feet of screening when the plantings reach maturity (Exh. EFSB-V-6). Footprint proposed that the majority of the trees planted on the berm would be a minimum 12 to 14 feet tall, and would consist of a mix of deciduous and evergreen trees and shrubs (Exh. SHR-16, at L-105 to L-106; RR-EFSB-59). Extending from the western and southern sides of the berm would be smaller earth terraces consisting of plantings, in order to create a tapered landscape to grade at Derby Street and the southern site boundary (Exh. EFSB-V-6). The Company provided the landscaping plans submitted to the City's Planning Board, which delineate the locations and specific types of plantings proposed (Exh. SHR-16, at L-102 to L-106).

The Company represented that it is open to ideas about how off-site landscaping could be used to increase the compatibility of the site with the surrounding neighborhood (Exh. EFSB-V-15). Footprint committed to continuing to support the maintenance of the David J. Beattie Park to the west of the site and stated that it has instructed its landscape architecture team to study potential improvements to the park (*id.*; Tr. 9, at 1584, 1633).

In this proceeding, Footprint provided a sample lighting plan that laid out the location of five types of lighting: non-directional area lighting; directional area lighting; personnel lighting; downward area lighting; and lighting required by the Federal Aviation Administration ("FAA") (Exh. HDSNA/PNA-FP-2). The Company also provided a landscape lighting plan along with the landscaping plans submitted to the City, which showed more detailed and extensive lighting

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<sup>50</sup> The National Grid Substation is located on the north portion of the 20-acre site. Currently, there are plantings with mature trees along the fence line of Fort Avenue that provide some visual screening of the substation (Tr. 7, at 1139). The Siting Board notes that any further plans for screening of the substation will be addressed in the transmission line petition recently filed by National Grid in EFSB 13-2.

placement (Exh. SHR-16, at E-102 and E-103).<sup>51</sup> The Company stated that all exterior lighting fixtures would be placed and directed so as to minimize off-site visibility of facility lighting (Exhs. HDSNA/PNA-FP-2; Exh. EFSB-V-13). Whenever possible, perimeter lighting would be placed below the level of the berm and with fixtures pointed downward to minimize direct or indirect visibility and off-site glare (Exhs. HDSNA/PNA-FP-2; EFSB-V-13). In accordance with FAA requirements, the stacks will be lighted, as they are over 200 feet. In addition, during construction any equipment over 200 feet, such as cranes, will require lighting (Exh. EFSB-V-12). The Company anticipates that stack lighting will likely consist of either red obstruction lighting or a dual lighting system in which medium intensity lights are used during the day and red obstruction lights are used at night, in conformance with FAA Advisory Circular 70/7460-1K (Exhs. EFSB-V-12; EFSB-V-22).<sup>52</sup>

The facility would not include a wet cooling tower; however, Footprint explained that the stack emissions would include moisture from combustion (Exh. EFSB-V-9(S)). Assuming both turbines were operating at 100 percent load, the Company analyzed the meteorological and operating conditions under which visible condensed vapor plumes likely would emanate from the new stack (*id.*). Using the AERMOD model, the Company estimated that a visible plume would extend beyond the site boundary for only a limited number of hours a year (*id.*).<sup>53</sup>

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<sup>51</sup> The Planned Unit Development Special Permit, Site Plan Review, and Flood Hazard District Special Permit decision (“PUD Special Permit”) issued August 1, 2013 contained a special condition concerning the development of a decorative lighting scheme to accent the stack and building (Exh. EFSB-LU-5-S2, at 12). The design and installation will be presented to the Planning Board after a noticed public hearing (*id.*).

<sup>52</sup> The Company explained that at least 60 days prior to construction it will file the required forms with the FAA necessary for both construction equipment and the stack that will exceed 200 feet. The Company stated that both the forms and the FAA determination would be filed with the Siting Board (Exh. EFSB-V-12).

<sup>53</sup> Specifically, the Company estimated that a plume of 100 meters in length, which is within the site boundary, would potentially be visible 2.6 percent of all daylight hours, while a plume at least 25 meters long would potentially be visible 18.6 percent of all daylight hours (Exh. EFSB-V-9(S)).

## 2. Analysis and Findings

Given the significantly lower stack height, the views of the proposed facility would be an improvement over the current conditions. Nonetheless, the focus of this review is on the visual impacts of the proposed facility on the surrounding neighborhoods, the City at large, and abutting communities such as Marblehead. For example, the visibility of the existing and proposed facility from areas such as the Bentley School, Winter Island, and the Derby Wharf, under both foliated and defoliated conditions, show that while the removal of the existing stacks significantly reduces the visual impacts, the proposed facility will remain a significant feature of the landscape, as viewed from these areas (Exhs. SHR-1, at Figs. 4.5.2.3-2 and -3; EFSB-V-7).

The arrangement of the facility on the site along with the architectural treatment of the turbine building will result in diminished views of the stacks and decreased lines of sight to other portions of the facility, which will give the impression of less mass. The Company has proposed an extensive landscaping plan, consisting of a 25-foot-high berm with additional plantings, as well as enabling views of the harbor through the design and location of pathways. The focus of the landscaping plan for the generating facility is the 20-acre site; any future landscaping and design is contingent on development plans for the entire parcel. The 65-acre parcel currently has a border of mature trees and shrubs along Derby Street and Fort Avenue that will remain. Further, the National Grid substation is slated to be upgraded in a separate Siting Board proceeding, and any landscaping associated with the substation will be reviewed at that time.

The Company intends to gather input from residents and municipal officials of the City on the facility's landscaping plans and design detail as the project progresses. The City also issued a special permit for the site in accordance with the Company's request for the project to be approved locally as a part of a Planned Unit Development (see Section IV.B.I, below); the special permit includes conditions on design, landscaping, and lighting of the 20-acre site. The Siting Board expects the discourse on the final landscaping and lighting plans, as well as architectural and design elements, to be an open, community-oriented process that will include subjects such as types of landscaping, placement of the berm, development of harbor views, lighting placement (including any use of decorative lighting), and the use of cladding. Therefore, the Siting Board directs the Company to submit for approval: (1) final landscaping, lighting and design plans; (2) a description of the community process that took place prior to the

completion of the final plans; and (3) a description of any changes to the plans from those in the record.

As discussed above, the design of the proposed facility coupled with the landscaping plan will be an improvement over the existing plant. However, locating a generating facility in close proximity to a developed community will inevitably result in visual impacts. In several prior generating facility decisions, the Siting Board has required proponents to mitigate visibility of the facility and the associated stack by providing selective tree plantings and other requested reasonable mitigation in all residential areas within varying distances of up to one mile of the proposed stack location. Montgomery Power Decision at 373 (one-half mile); IDC Bellingham LLC, 9 DOMSB 225, 298-300 (1999) (one mile); Nickel Hill Decision at 179 (one mile).

Consistent with previous cases, the Siting Board directs the Company to provide, as requested by individual property owners or appropriate municipal officials, reasonable off-site mitigation of visual impacts, including shrubs, trees, window awnings, or other measures that would screen views of the proposed generating facility and related facilities at affected residential properties and roadways up to one-half mile from the 20-acre site boundary where the facility impacts views. The Siting Board chooses a one-half mile setback from the 20-acre site boundary for required visual mitigation measures after a review of mapping data, the number of residences that would be affected by the proposed power plant, the density of homes within the area, as well as Board precedent. In implementing this requirement, the Company: (1) shall provide shrub and tree plantings, window awnings, or other reasonable mitigation on private property, only with the permission of the property owner, and along public ways, only with the permission of the appropriate municipal officials; (2) shall provide written notice of this requirement to appropriate officials and to all owners of property within one-half mile of the 20-acre site boundary, prior to the commencement of construction; (3) may limit requests for mitigation measures to a specified period ending no less than six months after initial operation of the facility; (4) shall complete all agreed-upon mitigation measures within one year after completion of construction, or if based on a request filed after commencement of construction, within one year after such request; and (5) shall provide a warranty to property owners to ensure that all plantings are established and replaced if needed at the end of one year from the date of planting, provided that the property owner reasonably maintains the plantings.

As further off-site mitigation for the facility, the Siting Board directs Footprint to maintain and enhance Beattie Park. Finally, the Siting Board directs the Company to maintain the good appearance of the facility, including the stack and on-site landscaping, for the life of the project.

The Siting Board finds that, with implementation of these conditions, the visual impacts of the proposed generating facility would be minimized.

F. Noise

1. Operational Noise

Footprint's ambient sound measurement program consisted of a combination of both short- and long-term measurements at noise sensitive areas and near the property lines (Exh. SHR-1, at 140). Long-term noise measurements were taken inside the 65-acre parcel over a 17-day period at two locations representing the northern and southern sections of the site (*id.* at 140, 144, Fig. 4.6.3-2-1; Exh. SHR-8, at 9-5). The long-term measurement data were reviewed primarily to validate short-term sound measurements that were collected off-site (Exhs. EFSB-NO-4). The short-term noise measurements were taken at off-site locations, which are used as the basis for the ambient conditions necessary to assess compliance with the MassDEP Noise Policy (Exh. SHR-8, at 9-5).<sup>54</sup> The Company explained that Salem Harbor Station was producing power during a portion of the long-term monitoring, while there was no power production during short-term monitoring (Exh. SHR-1, at 142-144).

The short-term measurements for each location were taken for two 30-minute intervals, one interval for daytime and one interval for nighttime (Exh. SHR-8, at 9-5).<sup>55</sup> The short-term

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<sup>54</sup> The MassDEP Noise Policy limits a new noise source to a ten dBA increase above the ambient sound at the property lines of the new source and nearest residences (Exh. SHR-1, at 134). The MassDEP Noise Policy also prohibits the production of "pure tone" conditions, where any "one octave band sound pressure level exceeds the two adjacent frequency bands by three dBA or more" (*id.*). These requirements will be contained in MassDEP's Air Permit for the facility. The City of Salem has adopted the ten-dBA limit in its PUD Special Permit (Exh. EFSB-LU-5S at 6).

<sup>55</sup> Initially, three of the short-term locations were measured only for the daytime period. However, upon request of Siting Board staff, all 14 locations were measured for nighttime ambient levels as well (Exhs. EFSB-NO-2-S; SHR-8-S at 15).

nighttime measurements were taken at various times between 10:30 p.m. and 3:45 a.m. (*id.* at 9-8 to 9-9; SHR-8-S at 9-8 to 9-9).<sup>56</sup> Given that the Salem Harbor Station facility was not generating power during the short-term measurements, any ambient noise from the existing Salem Harbor Station facility during those times was attributed largely to the National Grid substation transformers and, to a lesser degree, to Salem Harbor Station support equipment such as HVAC fans (Exhs. EFSB-NO-5; EFSB-NO-47; Tr. 4, at 647). The nighttime sound levels exceeded 90 percent of time (“L<sub>90</sub>”) ranged from 36 A-weighted decibels (“dBA”) to 47 dBA (*see* Table 5, below) (Exh. SHR-8-S at Table 9-4).<sup>57</sup> The daytime ambient L<sub>90</sub> sound levels ranged from 39 dBA to 51 dBA (Exh. SHR-8, at Table 9-2).

The Company initially conducted short-term measurements at nine locations: Fort Avenue, Fort Avenue/Derby Street, Bentley Elementary School, Derby Street/Webb Street, Derby Street South, Naugus Avenue in Marblehead, Winter Island Park, Winter Island Road, and the Blaney Street Pier (Exh. SHR-1, at 142-144). At the request of Siting Board staff, measurements were taken at three additional locations: the residence closest to the southwest corner of the parcel (the Mackey Building and Art Gallery), located approximately 750 feet from the facility site boundary; the House of the Seven Gables; and Pickering Wharf (Exhs. SHR-11, at Figure 1-4; EFSB-NO-6-S). In addition, at the request of MassDEP, the Company measured noise at two more locations on Winter Island – the Plummer House and the Winter Island Turbine/Winter Road Residences (Exh. SHR-8-S at 15).

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<sup>56</sup> The nine initial short-term measurements were taken between 10:35 p.m. and 12:30 p.m. (Exh. SHR-1, at 143-144). The subsequent short-term measurements were taken between 1:00 a.m. and 3:45 a.m. (Exh. SHR-8, at 9-8 to 9-9). The Company stated that the hours from 10:00 p.m. to 6:00 a.m. are considered typical nighttime hours for ambient sound measurement (Exh. EFSB-NO-1). Siting Board staff and the MassDEP had concerns with the 10:00 p.m. to 6:00 a.m. timeframe; the comments on the Draft Environmental Impact Statement (“DEIR”) state that typical quietest hours are between 12:00 a.m. and 4:00 a.m. (Exhs. EFSB-NO-27; SHR-11, App. B, MassDEP Comments at 3; Tr. 4 at 630-637). Therefore, given that some of the short-term measurements were conducted before midnight, MassDEP requested that the Company adjust ambient levels downward by two dBA at any location where ambient levels were measured before midnight, which included five locations (Exh. SHR-8-S at 15; RR-EFSB-43).

<sup>57</sup> L<sub>90</sub> is the sound level exceeded for 90 percent of the measuring period, and is used to represent background, or baseline ambient sound level.

**Table 5. Predicted Nighttime Noise Levels During Base Load Operation (dBA)**

| <b>Receptor</b>                     | <b>Ambient<br/>(L<sub>90</sub>)</b> | <b>Proposed<br/>Facility</b> | <b>Total</b> | <b>Increase</b> |
|-------------------------------------|-------------------------------------|------------------------------|--------------|-----------------|
| ST-1 22 Fort Avenue                 | 47                                  | 44                           | 49           | 2               |
| ST-2 Block House Sq./Derby St.      | 42                                  | 44                           | 46           | 4               |
| ST-3 Bentley School                 | 39                                  | 41                           | 43           | 4               |
| ST-4 36 Derby Street                | 39                                  | 43                           | 44           | 5               |
| ST-5 56 Derby Street (south)        | 39                                  | 44                           | 45           | 6               |
| ST-6 79 Naugus Ave (Marblehead)     | 36                                  | 34                           | 38           | 2               |
| ST-7 Winter Island Park             | 39                                  | 39                           | 42           | 3               |
| ST-8 Winter Island Road             | 38                                  | 33                           | 39           | 1               |
| ST-9 Blaney Street Pier             | 39                                  | 42                           | 44           | 5               |
| ST-10 Mackey Building               | 36                                  | 41                           | 42           | 6               |
| ST-11 House of Seven Gables         | 39                                  | 37                           | 41           | 2               |
| ST-12 Pickering Wharf               | 41                                  | 32                           | 42           | 1               |
| ST-13 Winter Island, Plummer House  | 40                                  | 33                           | 41           | 1               |
| ST-14 Winter Island Road Residences | 34                                  | 33                           | 38           | 4               |

Source: Exh. SHR-8-S-1, Table 9-4

Using an acoustic software model, the Company determined that the project would increase the lowest background sound levels at measured locations by one to six dBA (Exh. SHR-8-S-1, at Table 9-4). See Table 5 above. The Company asserted that a six-dBA increase is the smallest increase that can feasibly be achieved at the Derby Street residential location (Exh. EFSB-NO-46; Tr. 4, at 694).

The three project sound sources that contributed the highest modeled sound levels at the short-term receptor locations were the ACC, the main exhaust stack, and the gas turbine inlet (Exh. EFSB-NO-42-S). The ranking of the three sources in terms of magnitude of sound impact

varies by receptor (*id.*).<sup>58</sup> The analysis of facility noise also includes the proposed Algonquin meter station and gas compressor station (Exh. EFSB-NO-7-S; RR-EFSB-30).<sup>59</sup>

The Company asserted that the predicted maximum sound levels during operation are conservative because the model assumed: (1) defoliated winter conditions with no foliage sound absorption; (2) all equipment was operating under maximum load conditions and; (3) worst-case meteorological conditions (Exhs. SHR-1, at 150; EFSB-NO-12; EFSB-NO-13-S).<sup>60</sup> The model also includes full sound reflection over water (Exh. EFSB-NO-45-S).

The Footprint facility would employ a number of noise mitigation measures including arranging facility structures to block noise, locating the ACCs as far away from the Derby Street and Fort Street receptors as possible, enclosing the steam turbine generator and the gas compressors within buildings, constructing internal acoustical walls, using low-noise fans and sound attenuating baffles for the ACC, constructing a gas turbine inlet silencing package, and installing main stack silencers and silencers for the steam system vents (Exhs. SHR-1, at 31-32; SHR-8, at 9-15; Tr. 4, at 709). The berm and retaining wall would also serve to mitigate noise (as well as visual impacts) (Exh. SHR-8, at 9-15; Tr. 4, at 665). The berm would be most effective at mitigating noise from sources closer to ground level, such as the gas compressor and transformers, and less effective at mitigating noise from elevated sources such as the ACC, the exhaust stack, and the gas turbine air inlet (Tr. 4, at 665-667).

The Company conducted a noise mitigation analysis that compared a reference design consisting of what the Company characterized as typical standard baseline mitigation against four options (Exh. SHR-8-S-1). Option Two included the proposed facility noise mitigation design (*id.*). Options Three and Four included mitigation measures greater than those proposed

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<sup>58</sup> The ACC is ranked as the noisiest sound source at nine of the twelve receptors and the main exhaust stack was the noisiest sound source at three of the receptors (Exh. EFSB-NO-42-S).

<sup>59</sup> The measured noise increases at all receptors, except for one, are the same whether the gas compressor is included as a noise source or not; the noise level at ST-7 (Winter Island Park) increases from two dBA to three dBA with the gas compressor (RR-EFSB-43).

<sup>60</sup> The Company explained that the model assumed calm, clear nights, which it categorized as infrequent (Exhs. EFSB-NO-12; EFSB-NO-13-S). Based on a review of Logan Airport meteorological data these types of conditions occur on average during 433 nighttime hours per year (Exh. EFSB-NO-13-S).

in Option Two (id.). Specifically, Option Three enhanced the GTG and STG building walls at an additional cost of \$3.85 million; and Option Four increased the attenuation of the stack silencers at an additional cost of \$1.92 million (id.). In contrast to these three options, Option One does not include ultra-low noise transformers or acoustic inlet plenums. Consequently, the Option One increases in sound levels at Derby Street residential locations would be eight dBA and seven dBA, respectively (Exh. SHR-8-S-1).

The analysis showed that Option Three resulted, at most, in a one-dBA reduction over the proposed project noise mitigation design, and that Option Four did not provide a full decibel reduction at any receptor (id.). Based on the minor decreases in noise provided by Options Three and Four, the Company asserted that its proposed noise mitigation design included in Option Two strikes the appropriate balance between cost and mitigation (id.).

**Table 6. Operational Noise Mitigation Options (dBA increase over ambient sound levels)**

| Receptor                             | Reference Case | Option 1    | Option 2<br>(Proposed Project) | Option 3     | Option 4     |
|--------------------------------------|----------------|-------------|--------------------------------|--------------|--------------|
| ST-1                                 | + 4            | +2          | +2                             | +2           | +2           |
| ST-2                                 | +12            | +8          | +4                             | +3           | +4           |
| ST-3                                 | + 8            | +4          | +4                             | +3           | +4           |
| ST-4                                 | +11            | +7          | +5                             | +5           | +5           |
| ST-5                                 | +10            | +6          | +6                             | +5           | +6           |
| ST-6                                 | + 3            | +2          | +2                             | +2           | +2           |
| ST-7                                 | + 6            | +3          | +3                             | +2           | +3           |
| ST-8                                 | + 2            | +1          | +1                             | +1           | +1           |
| ST-9                                 | + 8            | +5          | +5                             | +5           | +5           |
| ST-10                                | +10            | +6          | +6                             | +6           | +6           |
| ST-11                                | + 5            | +2          | +2                             | +2           | +2           |
| ST-12                                | + 2            | +1          | +1                             | +1           | +1           |
| ST-13                                | + 2            | +1          | +1                             | +1           | +1           |
| ST-14                                | + 5            | +4          | +4                             | +4           | +4           |
| Incremental Cost Over Reference Case |                | \$8,799,200 | \$12,388,100                   | \$16,244,900 | \$14,324,100 |
| Selected for Project                 |                | NO          | YES                            | NO           | NO           |

Source: Exh. SHR-8-S-1

With regard to operation of the facility, the City's Noise Ordinance does not prescribe numerical sound limits but does prohibit any noise that may be dangerous, injurious, or

disturbing, constituting a “noise disturbance” (see Section IV. F.2, below, regarding construction restrictions) (Exhs. SHR-1, at 135; EFSB-NO-17, at 1).

## 2. Construction Noise

The City’s Noise Ordinance places restrictions on construction and demolition activity that causes noise, specifically prohibiting activity that “creates a noise disturbance across a residential real property boundary” during the hours of 5:00 p.m. to 8:00 a.m. on weekdays and Saturday, and at any time on Sunday and holidays (Exhs. SHR-1, at 135; EFSB-NO-17-1). Such construction and demolition outside of these times requires a variance issued by the building inspector with notice to the Police Department. Before the variance is granted the City Council must also be notified (Exhs. SHR-1, at 135; EFSB-NO-17-1). In addition, the operation of equipment used for blasting, hydraulic blasting, rock crushing, pile driving, or jack hammering during the hours of 5:00 p.m. to 8:00 a.m. on weekdays or any time on Saturday, Sunday and holidays is prohibited (Exh. EFSB-NO-17-1). Any of these activities outside of these times requires a variance first approved by the City Council, and then issued by the building inspector with notice to the Police Department (id.).

Construction of the proposed facility is anticipated to take place over 23 months (June 2014 through May 2016) (Exh. SHR-1, at 154).<sup>61</sup> Demolition will begin in early 2014 and add several months to the total schedule (id. at 38 and Fig. 1.9.1-2). Noise from construction activity close to the edge of the site was modeled at three locations: the nearest residences, the Bentley Elementary School, and the school fields (Exh. SHR-8-S at 18). The Company explained that the modeling for construction noise reflects the worst-case location of equipment for each construction phase, as well as the exclusion of any shielding effects from intervening structures or buildings (id. at 17). Construction noise levels, without site specific mitigation, will vary based on construction phase, which the Company anticipated would range from 65 dBA  $L_{eq}$

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<sup>61</sup> Construction is divided into five phases, with different equipment and activities associated with each phase. The phases are: (1) demolition, clearing and excavation; (2) foundation and concrete pouring; (3) steel erection; (4) mechanical; and (5) finishing work and cleanup (Exhs. SHR-1, at 155; SHR-8-S at 18).

for foundation and concrete pouring to 83 dBA  $L_{eq}$  for excavation at the nearest residences along Derby Street and from 56 to 76 dBA  $L_{eq}$  at the Bentley School and fields (*id.* at 18).<sup>62</sup>

Upon staff's request, the Company conducted an analysis of the worst-case scenario of construction noise impacts at the nearest residence and at the Bentley School, based on the assumption that construction of the proposed facility would occur simultaneously with construction of the National Grid transmission line and the Spectra gas pipeline using the estimated routes presented during the proceeding (RR-EFSB-33). According to the Company's estimates, the loudest noises from construction of the transmission line and the gas pipeline would overwhelm noise from construction of the Footprint facility. As a result, the worst-case construction noise levels from the three projects, if simultaneous, would apparently include only a minimal contribution from Footprint (*id.*).

The Company proposed standard construction work hours from 7:00 a.m. to 3:30 p.m., Monday through Friday, comprising a single work shift (Exh. EFSB-NO-24). The Company based its construction schedule on these hours of construction (Tr. 9, at 1616). The Company has requested a waiver of the Salem Noise Ordinance for the period from 7:00 a.m. to 8:00 a.m. (Tr. 6, at 1076). In addition, the Company has stated its desire to work second and possibly third shifts, if necessary, but has stated that such work would be restricted to "non-noisy activities" (Exhs. SHR-1, at 39; EFSB-NO-24). The Company did not define the term "non-noisy". However, the Company provided some examples of non-noisy activities, such as indoor piping, wiring, instrumentation installation, cleanup, inspections, and testing of equipment (Exh. EFSB NO-36). Specifically, the Company explained that it anticipated that multiple work shifts might need to occur during the mechanical and electrical installation phases in 2015 and early 2016 (Exhs. EFSB-NO-24; EFSB-NO-36). Also, the Company stated that it anticipates that in the peak period of construction, which it defined as two to three months, interior work would necessitate a second shift to reduce worker congestion in the buildings (Tr. 9, at 1617). According to Footprint, the schedule of a second shift would be 4:00 p.m. to midnight and a third shift would be midnight to 7:00 a.m. (Exh. EFSB-NO-36; Tr. 9, at 1611). The Company alleged that this work would not be disruptive to the neighborhood (Tr. 9, at 1612).

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<sup>62</sup>  $L_{eq}$  refers to the equivalent sound level or the energy average sound level that occurs over a given time period.

The Planned Unit Development (“PUD”) Special Permit, issued August 1, 2013, contains a special condition concerning construction noise. The condition is:

“[d]uring construction the Applicant may request approval to work outside the normal work hours of 7:00 a.m. to 5:00 p.m. from the Building Inspector provided that (a) the noise level will not create noise in the neighborhood at levels in excess of the noise from the operation of the existing Salem Harbor Station; (b) Footprint will monitor sensitive noise receptors, as necessary, during second and third shifts; and (c) Notice of second and third shift work is coordinated with the City in advance in order to notify abutters and abutters to abutters within 300 feet. It is noted that the City will limit noisy work if previously established acceptable levels are exceeded” (Exh. EFSB-LU-5-S-2, at 11 of 12).

The PUD Special Permit does not include a quantitative definition for “noise from the operation of the existing Salem Harbor Station.” A study conducted in December 2000 measured an L<sub>90</sub> nighttime ambient noise level of 48 dBA at the closest residence with the existing Salem Harbor Station plant operating (Exh. EFSB-NO-15-1; RR-EFSB-32). For comparison, noise attributable to the proposed facility will be 44 dBA at the nearest residence, which when combined with ambient noise would result in nighttime noise levels of 49 dBA (Exh. SHR-8-S-1, at Table 9-4).

In its brief, the Company states that every reasonable and feasible mitigation measure would be made to minimize construction noise and avoid disturbing nearby residential and other sensitive receptors, and that the contractor will develop a Construction Noise Management Plan (Company Brief at 94). The Company acknowledges that construction scheduling is one of the most effective forms of noise mitigation for area residents (Tr. 4, at 719). Mitigation of construction noise would also include speed limits for construction site access roads and, as practicable, the use of mufflers on construction equipment, placement of noisy equipment away from residences, and closing the engine-housing panels on equipment while in use (Exh. EFSB-NO-18).

The Company initially discussed the potential for the proposed landscaped berm to mitigate construction noise. However, upon further analysis, the Company maintained that the berm would not provide adequate noise mitigation during construction (RR-EFSB-61). The Company analyzed installing a temporary sound wall along Derby Street that, as modeled, would decrease construction noise at nearby residences and the Bentley School by eleven to twelve dBA for all construction phases (Exh. SHR-8-S at 19). The sound wall would be twelve feet high and would cost approximately \$250,000 (*id.*; RR-EFSB-61).

Finally, in order to measure and mitigate any impacts from construction vibration, such as pile driving, the Company offered to conduct pre-construction and post-construction surveys of surrounding foundations and areas (Tr. 4, at 729). However, the Company's expert witness opined that given the location of the proposed facility, the residences, school and historic areas would not experience vibration-related impacts (id. at 730).

### 3. Intervenors' Positions

The City points out that the site is close to residential Salem neighborhoods, close to downtown Salem, and close to historic Salem (Salem Brief at 7). The City is satisfied with all of the noise protections that are being proposed and that are in place, including the sound wall (July 11, 2013, EFSB Meeting Tr. at 28). However, in areas that could potentially be affected by second and third shift noise, the City would like to have noise monitoring data and to work with Footprint to identify concerns, and to either shut down, reschedule, or stop noisy work (id.).

The HDSNA/PNA brief includes noise in a list of concerns for residents in the immediate vicinity of the project (HDSNA/PNA Brief at 3). The HDSNA/PNA wants the sound wall to be mandatory, and would prefer that it be built to enclose the entire perimeter of the site (July 11, 2013, EFSB Meeting Tr. at 103-104). The HDSNA/PNA has no objections to non-noisy activities after normal construction hours as long as there is no associated traffic creating disturbances in the middle of the night (id. at 104). Further, they argue that noisy construction should not occur during 7:00 a.m. to 8:00 a.m. (id. at 105).

### 4. Analysis and Findings

In prior decisions, the Siting Board has reviewed the noise impacts of proposed facilities for general consistency with the applicable governmental regulations, including the MassDEP ten-dBA standard. PVEC Decision at 328; Montgomery Power Decision at 380-381; Massachusetts Municipal Wholesale Electric Company, 16 DOMSB 233, 267-268 (2008); Brockton Power, LLC, 10 DOMSB 157, 217 (2000) ("Brockton Decision 2000"). As part of reviewing whether projects meet the Siting Board's "minimum environmental impact" standard, the Siting Board has also considered the significance of expected off-site noise increases below the MassDEP ten-dBA standard that may nevertheless adversely affect residents. In cases where measured background noise levels at the most affected residential receptors were neither

unusually noisy nor unusually quiet, the Siting Board has accepted or required facility noise mitigation sufficient to hold residential increases to five dBA to eight dBA.<sup>63</sup>

With respect to generating facility operating noise, the record shows that the increase in noise levels at residential receptors would range from two dBA to a maximum of six dBA. The Siting Board has accepted an increase of six dBA in previous cases. Nickel Hill Decision, 11 DOMSB at 188; Sithe Edgar Development, LLC, 10 DOMSB 1, 92 (2000) (“Sithe Edgar Decision”). The Siting Board finds that the additional mitigation identified by the Company in this case would not be cost effective or likely result in a perceptible difference (e.g., measures resulting in a one dBA decrease would cost \$3.85 million).

The nearest neighborhoods to the proposed site include residences and other sensitive receptors such as an elementary school, and historic and recreational attractions, for which noise increases between three and six dBA may be noticeable. The record indicates that in order to hold noise increases at the nearest residences and sensitive receptors to no more than six dBA – a level the Siting Board has found appropriate in a number of prior cases – the Company will need to incorporate a significant amount of noise mitigation measures, at a cost of a cost of \$12,388,100. To ensure that the specified noise levels are met at all sensitive receptors, verification over the first year of operation is appropriate.

Therefore, to help ensure that the operational noise impacts of the proposed facility are as estimated, the Siting Board directs the Company to consult with the City and MassDEP to develop an operational noise monitoring protocol, which shall consist of an ongoing periodic noise monitoring program and reporting procedure. The protocol shall include the collection of additional baseline noise measurements, taken on a schedule chosen in consultation with MassDEP and the City, and the periodic noise monitoring program should begin within six months of the commencement of the facility’s commercial operation. The reporting procedure should provide for dissemination of monitoring results to the City and the community areas that are affected by noise increases from the facility of three dBA or more. The Company shall submit a copy of the noise monitoring protocol to the Siting Board prior to commercial

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<sup>63</sup> The Siting Board reminds the Company and future applicants that, consistent with a MassDEP correction to ambient noise modeling in this case, nighttime measurement should reflect the quietest time of night, which would be 12:00 a.m. at the earliest and 4:00 a.m. at the latest.

operation. In the process of developing this protocol, the Company shall provide to intervenors in this proceeding an opportunity to comment on the proposal.

The record shows that normal construction hours will be from 7:00 a.m. to 3:30 p.m., Monday through Friday, and the construction schedule is based on this assumption. The Company stated that every reasonable and feasible mitigation measure will be implemented to minimize construction noise and avoid disturbing nearby residential and other sensitive receptors, and acknowledged that placing restrictions on noise hours is one of the most effective methods of achieving this goal. However, it has also expressed a desire to be able to conduct “non-noisy” construction activities outside these hours, using multiple shifts. The Company has assured the Siting Board that the work during these shifts will not be disruptive to the surrounding neighborhood. The record indicates that without a variance, noise from the equipment used for construction or demolition that would create a noise disturbance across a residential property boundary is prohibited by the Salem bylaw, from 5:00 p.m. to 8:00 a.m., Monday through Saturday, and at any time Sundays and holidays. Additionally, the operation of equipment used in blasting, rock crushing, pile driving, or jack hammering is prohibited by the Salem bylaw from 5:00 p.m. to 8:00 a.m., Monday through Friday, and at any time Saturdays, Sundays, and holidays.

The City has indicated that it is in the best position to monitor the construction hours and practices of Footprint through the CBA and its permitting and approval processes. Therefore, the possible use, on an as-needed basis, of multiple shifts for non-noisy activities should in this case be monitored by the City. As noted above, the City has included a condition its PUD Special Permit addressing potential construction noise during second and third shifts. However, the Siting Board is unclear as to the actual noise levels being proposed in the PUD Special Permit. Specifically, there is no quantitative dBA level associated with the reference to “levels in excess of the noise from the operation of the existing Salem Harbor Station.”

With regard to noisy construction activities, the Company has asserted that it will confine its normal construction activities to the hours of 7:00 a.m. to 3:30 p.m., Monday through Friday. The Siting Board has never had a case where a petitioner requested, nor has the Board allowed, unrestricted noisy construction activities to occur during nighttime hours, which would be an even greater concern in a densely developed residential neighborhood. Given the potential for noise disturbances, the Siting Board directs the Company to confine noisy construction activities

to weekdays only, with the exception of work that necessarily has a longer required continuous duration than normal construction hours allow, such as a concrete pour. Specifically, the Company may engage in any construction activities Monday through Friday, not earlier than 7:00 a.m. and not later than 5:00 p.m.<sup>64, 65</sup> Non-noisy construction outside of these hours is to be requested from and scheduled through the City, and monitored by the City to ensure that such work is not disruptive to the community. Should the Company and the City not agree on such requests, the Company may make a request directly to the Siting Board, and notify the City in writing that it has done so. It shall be the Company's responsibility to demonstrate that it meets these requirements.

Given the uncertainty noted above as to what specific construction noise levels would be allowed by the City during any second or third shifts, and the subjectivity surrounding the terms "noisy" and "non-noisy," the Board is concerned that there could be issues regarding adherence to the Siting Board's directives. In order to provide a directive that reflects the Siting Board's responsibility to minimize environmental impacts, the Siting Board defines "non-noisy" for the construction noise condition as a sound level no more than 48 dBA attributable to construction (using  $L_{max}$ )<sup>66</sup> at all impacted receptors. The record indicates that this noise level is comparable to noise levels from the existing plant and slightly above the predictions for the noise attributable to the proposed facility. For clarification, the Siting Board requests more information on the intended parameters of the construction noise condition contained in the PUD Special Permit. Therefore, the Siting Board directs Footprint to provide a compliance filing that includes a

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<sup>64</sup> The Company noted that its normal work hours would be from 7:00 a.m. to 3:30 p.m. The Siting Board allows any type of construction up to 5:00 p.m., as the Board has less concern about construction noise before 5:00 p.m. Furthermore, the PUD Special Permit defines normal construction work hours as between 7:00 a.m. and 5:00 p.m.

<sup>65</sup> The City of Salem's Noise Ordinance and the PUD Special Permit differs from this condition in that construction is allowed on Saturdays (except for blasting, rock crushing, pile driving or jackhammering). The Siting Board expressly limits any additional Saturday work hours allowed by the City of Salem under the PUD Special Permit to "non-noisy" activities, as defined in the PUD Special Permit and the Board's 48 dBA limit, described above.

<sup>66</sup> " $L_{max}$ " is the maximum instantaneous sound level.

quantifiable explanation of what nighttime construction sound levels the City would regard as “noisy” and, therefore, would be prohibited by the PUD Special Permit in the surrounding neighborhood.<sup>67</sup>

To address potential vehicle noise and disturbances to the neighborhood that could arise in conjunction with construction worker traffic in the event of second or third shifts, the Siting Board directs the Company to develop and adopt a clear and strict policy for its workers and contractors to minimize vehicular noise and visual impacts to surrounding neighborhoods in the event of second or third shift construction. The policy should include designated speed limits, staggered times of arrivals and departures, proper maintenance of vehicles, avoiding use of high beams and loud sound systems, and carpooling incentives, as well as additional mitigation measures that may be useful. Further, to encourage minimally disruptive worker arrivals and departures at the site, the Siting Board directs the Company to provide a police detail between the second and third shifts when the total number of workers entering and exiting the site exceeds 100 workers at the shift change.

In addition, it is important that an outreach plan is in place to communicate with the area residents in the event of planned construction events outside of normal business hours. Consequently, the Siting Board directs the Company, in consultation with the City, to develop an outreach plan for project construction and further development of the parcel, to be made available to the public by December 31, 2013. This outreach plan should, at a minimum, set forth procedures for providing prior notification to affected residents of: (1) the scheduled start, duration, and hours of construction; (2) any construction the Company intends to conduct that must take place outside of the hours detailed above; and (3) complaint and response procedures including contact information, the availability of web-based project information, a dedicated project hotline for complaints, and protocols for notifying schools of upcoming construction. Furthermore, any noise complaints and the Company response thereto, arising from construction and/or worker traffic that occurs outside of the hours of Monday through Friday from 7:00 a.m.

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<sup>67</sup> The City may elect to impose a more restrictive noise limit than the Board’s 48 dBA limit as a condition of its PUD Special Permit. In the event that the PUD Special Permit reflects a more permissive noise limit, the Siting Board’s 48 dBA limit will govern the determination of “noisy” construction activities.

to 5:00 p.m., shall be reported to the Siting Board within one week of the Company's receipt of the complaint.

Finally, based on the significant noise reductions that could be realized by the placement of a temporary sound wall at the site boundary along Derby Street during construction, the Siting Board directs the Company to install, prior to construction and demolition, and no later than June 2014, a twelve-foot high temporary sound wall at the western boundary of the site along Derby Street.

Accordingly, the Siting Board finds that, with the implementation of the above conditions, the noise impacts of the proposed facility would be minimized.

#### G. Safety

This section describes the safety impact of the proposed project with regard to site security, construction safety, operational safety, and ammonia handling and storage.

##### 1. Site Security

Footprint indicated that during construction it would maintain the existing site barriers consisting of plantings along Derby Street and fences around all non-water perimeters of the site (Exh. EFSB-S-13; Tr. 3, at 543). The Company stated that the parcel's water perimeter will continue to be monitored by security cameras and the Salem harbormaster will be notified if there are any encroachments or potential encroachments (Tr. 3, at 544). The Company stated that long-term security measures would be integrated into the perimeter landscape design of the new facility and that there would be no chain-link fences used in the project (Exh. EFSB-S-13).

The Company stated that its landscape design would include a berm separated by a sheer wall from the facility. The wall would extend upward beyond the height of the berm tall enough so that it cannot be jumped over, with no footholds, thereby preventing unauthorized access to the facility (Tr. 3, at 547). The Company stated that the berm would not extend to the north side of the proposed facility that abuts the existing National Grid substation; on that side the proposed facility will be blocked by the fencing around the substation (Tr. 8, at 1287-1290).

The Company maintained that once the Footprint facility is in operation, staff would monitor the entire security perimeter within the berm and the fencing by video camera, 24 hours a day (Tr. 3, at 551). The main entrance to the proposed facility off of Fort Avenue will be

blocked by a gate and the accompanying guardhouse. The secondary, emergency access entrance is also off Fort Avenue to the north of the main entrance, will be gated and accessible only with the appropriate credentials, and will be monitored by cameras (Tr. 8, at 1289-1290). Footprint argues that, with these features, it has designed a security strategy that balances safety, visual, and public access objectives (Company Response to HDSNA/PNA Brief at 3).

## 2. Construction Safety

The Company stated that before construction begins, the EPC contractor will develop a safety plan to ensure compliance with all applicable federal, state, and local safety standards (Exh. SHR-1, at 156). The Company stated that the EPC contractor will be required to conduct auditing of construction operations to enforce safety and health standards (*id.*). The Company maintained that it will be responsible for reviewing the EPC contractor's safety plan and coordinating it with the safety plans of other parties on site, including demolition and remediation contractors (Tr. 3, at 554-555). The Company testified that there will be an owner's representative and typically multiple safety engineers on site whenever work is occurring, with at least one safety engineer on site whenever there are 20 workers on site (*id.* at 557-558).

The Company stated that it will develop and follow safe demolition procedures for the existing stacks (*id.* at 559; Tr. 5, at 879). In addition, the Company also indicated that it will follow all applicable regulations for handling chemicals and comply with all applicable requirements for the equipment utilized during construction (Exh. SHR-1, 156). Footprint testified that it will not use natural gas to blow clean any newly installed pipe, which was the procedure that contributed to an explosion during construction of a natural gas plant in Connecticut in 2010 (Tr. 9, at 1537-39).

## 3. Operational Safety

Footprint stated that the project would feature fire-retardant building materials, fire protection systems, automatic shutdown systems, secondary containment around all bulk material storage structures other than water tanks, emergency lighting, and adequate access for firefighting equipment and personnel to reach all areas of the site (Exh. SHR-1, at 156-158). The Company committed that prior to the start of operations, it would schedule plant orientation tours and an overview of planned emergency response procedures for the City fire personnel and other

emergency responders, and would provide ongoing training as needed (*id.* at 158; Tr. 3, at 563). The Company stated that it will develop a comprehensive safety and health protection plan prior to plant operation (Exh. SHR-1, at 158). Additionally, the Company stated that it will develop an Emergency Response Plan working with the City's stakeholder group, which includes representatives from the City's Administration, Police and Fire departments, and harbormaster (Tr. 3, at 561-562).<sup>68</sup>

The Company also testified that the operator in the control room would have the ability to isolate the plant from the gas line, and in the unlikely event of fire at the plant, a valve would automatically shut off the natural gas supply to the facility (Tr. 9, at 1535-1540). Footprint testified that Algonquin will construct and own the natural gas pipeline up to the meter station within the secure perimeter of the Footprint site, and will be responsible for the safety of the pipeline up to the meter station (Exh. SHR-1, at 4; Tr. 5, at 919; Tr. 8, at 1430-1431). Footprint stated that Algonquin will need to obtain a permit from FERC and go through MEPA review process in order to build the proposed natural gas pipeline (Exh. SHR-11, at 2-2).

The Company stated that it would prepare a Spill Prevention Control and Countermeasure ("SPCC") plan because it will store on site lubricating oil in excess of a threshold of 1,300 gallons (Exh. EFSB-S-10). The Company indicated that it would store, handle and dispose of oil and other chemicals properly in accordance with applicable regulatory standards, and would have secondary systems in place to contain oil and chemical spills or releases (Exh. SHR-1, 163-165; Tr. 3, at 569-570).<sup>69</sup> The Company stated that the design-basis temperatures for the facility are from -10°F degrees to 105°F, and that even above 105°F, the facility would operate safely, but less efficiently (Tr. 3, at 573-576).

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<sup>68</sup> As a condition of the PUD Special Permit, Footprint is required to develop an Emergency Plan that is deemed satisfactory by the City's Police and Fire Departments before the issuance of a Certificate of Occupancy. Additionally, the Company is required to pay for an emergency training exercise for public safety officials prior to the opening of the facility and repeated on an annual basis, as deemed necessary by the City (Exh. EFSB-LU-5-2, at 11).

<sup>69</sup> The Company also stated that the Footprint facility will not require a Hazardous Waste Contingency Plan or a Risk Management plan, and the Footprint facility is not anticipated to require a Facility Response Plan because it is under applicable thresholds, such as fewer than 1,000,000 gallons of oil on site (EFSB-S-9).

Footprint stated that the proposed project would include a 34,000-gallon above-ground, steel tank twelve feet in diameter and approximately 40 feet in height for on-site storage of 19 percent aqueous ammonia (Exh. SHR-1, at 158). The Company indicated that the tank would have single-wall construction, which the Company asserted provides for more effective monitoring and reparability than a double-wall tank (*id.*). The Company indicated that the tank, as well as ammonia transfer pumps, valves, and piping would be located within a concrete containment dike that would be able to hold 110 percent of the volume of the tank (*id.* at 158-159). The Company stated that in order to reduce the exposed surface area of aqueous ammonia in the dike by 90 percent in case of a spill or leak, the diked area would include passive evaporative controls such as polyethylene balls (*id.* at 159). The Company also indicated that the entire tank and diked area would be located within a sealed enclosure with roof vents as the only ventilation for the structure, noting that such a structure would be consistent with recent Siting Board precedent (*id.* at 159 n. 29, citing Braintree Decision at 135-137 (2008) and Brockton Power Decision at 226-227). Based on the expected run time of the proposed facility, the Company expects six to ten truck deliveries per month of 19 percent aqueous ammonia and these deliveries will continue to use the route currently used to deliver urea to the existing facility (Tr. 3, at 542; RR-EFSB-29). The Company stated that transfer from the delivery trucks to the storage tank will take place within a contained concrete storage tank unloading pad with drainage into the diked containment area, and trucks will be required to have fast-acting shut-off valves (Exh. SHR-1, at 159).

According to the Company, the ammonia storage tank will be leak tested before it is put into operation (Tr. 3, at 577). Subsequently, there would be daily external inspections by plant personnel, annual external inspections by a consultant, and internal inspections every five to ten years (*id.* at 578). Permanently mounted air monitoring equipment designed to detect ammonia vapors would be installed inside the enclosure, connected to alarms in the facility control room with local annunciation (Exh. EFSB-S-6). The Company committed to developing a site-specific spill response plan and emergency response plan that includes employee training on first responder steps, proper incidental spill cleanup, and training on identifying an emergency situation (*id.*; EFSB-S-8).

The Company indicated that it used the USEPA's Areal Locations of Hazardous Atmospheres ("ALOHA") model to estimate the maximum one-hour average concentrations for

an accidental ammonia release from the proposed facility at the nearest public receptors in a worst-case release scenario defined by the parameters developed by the USEPA and the National Oceanic and Atmospheric Administration (“NOAA”) (Exh. SHR-1, at 160). The Company stated that those parameters are a release of the entire 34,000-gallon tank at 103°F and low wind speeds (0.85 meters per second or 1.9 miles per hour) (Exh. SHR-8-S-1). Based on its modeling, Footprint calculated that airborne ammonia concentrations would be 20.2 parts per million (“ppm”) at the closest perimeter of the Footprint facility, which is within the northern portion of the parcel, and 6.7 ppm at the closest residence (Exh. SHR-8-S-1 ). These concentrations are below the American Industrial Hygiene Association’s Level 1 Emergency Response Planning Guideline (“ERPG-1”) of 25 ppm, the lowest of a series of three thresholds (Exh. SHR-1, at 162). The Company indicated that effects that could occur with exposure to ammonia concentrations up to 25 ppm include awareness of the odor of ammonia and possibly mild and transient upper respiratory irritation (Exh. EFSB-S-19).

#### 4. Intervenors’ Positions

The HDSNA/PNA questions the safety of allowing public access on certain parts of the site, arguing that the Company has not demonstrated that the proposed site configuration and security plan will provide protection from “vandals, vagrants, terrorists, or even local kids” equal to security for the existing facility (HDSNA/PNA Reply Brief at 2). Furthermore, the HDSNA/PNA asserts that designing the pedestrian path in proximity to the gas pipeline connection reduces security (*id.*). The HDSNA/PNA cites safety as the association’s primary concern, in particular a gas explosion at the power plant site, noting the densely populated surrounding neighborhood and nearby school (*id.*).

The City notes that the project will require a multitude of inspections by the City for electrical, water, sewage, and other installations (Salem Brief at 17). The City proposes that Footprint should be required to file a plan with the Siting Board by November 1, 2013, as to how the Company will enable the required inspectional tasks through a combination of paying for the inspections performed by the City and self-inspecting and self-certifying certain parts of the construction (*id.*).

## 5. Analysis and Findings

The record demonstrates that Footprint will maintain a secure perimeter during both construction and operation. The record shows that Footprint would have programs in place to ensure safety for employees and the surrounding community during facility construction and operation. The record also indicates that the Company would store, handle and dispose of oil and other non-fuel chemicals properly, in accordance with applicable regulatory standards, and that it would have secondary systems to contain oil and chemical spills or releases. Furthermore, Footprint will have safety measures in place during construction and operation to minimize the risks associated with using natural gas as a fuel source. However, issues related to the natural gas supply pipeline up to and including the meter station to be owned by Algonquin on the site are outside the scope of this proceeding. The Siting Board intends to intervene in the FERC proceeding for this proposed pipeline and will have opportunities to make recommendations about the safety of the Algonquin natural gas pipeline during that proceeding.

The record shows that the Company proposes to store aqueous ammonia on site in an enclosed 34,000-gallon tank, surrounded by a dike impoundment with 110 percent of the tank capacity. The record shows that in the event of a worst-case ammonia release, ammonia concentrations would be approximately 20.2 at the nearest Footprint facility perimeter, which is still within the 65-acre parcel, and 6.7 ppm at the nearest residence, which are both less than 25 ppm, a level which the record indicates does not cause more than transient effects for most people. The ammonia tank and diked area would be within an enclosure, in keeping with the decisions of recent Siting Board cases. See Brockton Power Decision at 226-227; Montgomery Power Decision at 387-388; Braintree Decision at 135-137.

To facilitate accurate and effective emergency response planning procedures, the Siting Board directs the Company to develop an Emergency Response Plan for the proposed facility in consultation with both the City and representatives of the HDSNA/PNA and to provide a report to the Board on the outcome of the consultations before the start of commercial operation of the facility. Such report should include a public version of the plan, as well as recommendations and comments resulting from the consultations. The City and the HDSNA/PNA may each submit a separate report to the Board, if they so desire. Based on the report(s), the Siting Board will confirm that the Company's safety and security plans establish that the safety impacts of the facility would be minimized or will identify any remaining concerns.

The record indicates that the project will require a number of inspections beyond those associated with a typical construction project. The Siting Board directs Footprint to file with the Board, by January 1, 2014, a plan that has been approved by the City, describing how the Company will enable the City to accomplish its required inspectional tasks for the project.

Accordingly, the Siting Board finds that, with the implementation of the above conditions, the safety impacts of the proposed project would be minimized.

#### H. Traffic Impacts

This section describes and evaluates traffic impacts associated with construction and operation of the proposed facility, including potential mitigation measures.

##### 1. Description

###### a. Construction Traffic

According to the Company, bulk materials and large items are to be delivered by barge or specialty vessel, with one to two barge deliveries expected per week during construction but no more than one vessel per day (Exhs. EFSB-T-4; EFSB-T-20; Tr. 3, at 448-449). Vessels would be used to transport major plant components, structural steel, siding, roofing, pre-cast concrete, and containerized smaller components; construction equipment such as cranes and bulldozers; demolition debris; and fill material (Exh. EFSB-T-3). Due to the narrow streets in Salem, and extensive overhead utilities, Footprint concluded that overland deliveries would be difficult for neighbors as well as logistically (Exh. EFSB-T-4).<sup>70</sup>

The Company anticipates a total of six to 18 truck deliveries per day during the construction period, consisting of shipments of smaller components, parts and office supplies, courier services, and service vehicles (Exh. EFSB-T-4; Tr. 3, at 449-450). Additionally, a total of 2,000 to 2,500 truck deliveries of ready-mixed concrete would be expected over the course of construction (Exh. EFSB-T-4). The Company committed that this concrete truck traffic would

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<sup>70</sup> Were all demolition materials, new equipment, and construction materials to be conveyed by truck, the project would entail a total of 1,000 to 1,500 loads of demolition materials, 2,000 to 2,500 loads each of equipment and materials including aggregate, 80 to 100 standard oversize deliveries of equipment, 30 to 40 heavy deliveries requiring specialized oversize vehicles, and 100 to 200 deliveries of construction equipment (Exh. EFSB-T-4).

occur during off-peak hours (id.; Tr. 3, at 449-450). Due to the off-peak timing, the Company maintained that concrete deliveries will have little to no impact on traffic operations at local intersections and roads serving the site (Tr. 3, at 450). Footprint indicated that trucks delivering other construction materials would travel to Salem from U.S. Route 1, I-95, Route 128, and points south via State Routes 1A, 22, 107, and 114; and then from Bridge Street (Route 1A) would reach the site via Webb Street (Exhs. EFSB-T-2; EFSB-T-2-1).

Construction workers are expected to travel to Salem from I-95 and Route 128 primarily using Routes 1A, 22, 62, 114 and 107 (Exh. EFSB-T-12). Within Salem, workers would travel via urban arterials and residential streets, approaching the construction site by way of Bridge Street, then by Webb Street and Derby Street; the site construction driveway would be maintained at the intersection of Webb Street and Derby Street (Exh. EFSB-T-8-1, at 1). Footprint plans to have temporary gravel parking lots on the site during construction, with a capacity of 600 to 625 vehicles (Exh. EFSB-T-13).

Footprint stated that over 250 workers would staff the Project each weekday during the 15-month period from December 2014 through February 2016. Within this period over 400 workers would work at the site for an 11-month period, with a peak of 587 workers per day (Exhs. EFSB-T-8-1, at 9; EFSB-T-10; SHR-1, at Fig. 1.9.1-2). As discussed in Section IV.F, above, the majority of work would take place between 7:00 a.m. and 3:30 p.m. (Exh. SHR-1, at 39).

The Company performed a traffic counting and intersection Level of Service (“LOS”) analysis in April 2012 for nearby streets in order to assess traffic that would be affected by construction, where predictions of LOS A through LOS F designate progressively longer wait times at intersections (id. at Att. FP-1; Exh. EFSB-T-8-1).<sup>71</sup> The traffic study looked at the conditions at six intersections near the site:

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<sup>71</sup> For example, LOS E is described as representing, for a signalized intersection, traffic near roadway capacity, at the limit of acceptable delay, with unstable traffic flow, poor signal progression, and wait times exceeding one traffic signal cycle. LOS F is characterized by traffic exceeding roadway capacity, with unacceptable delays, extremely unstable traffic flow and congestion, and stop-and-go conditions (RR-EFSB-25).

1. Fort Avenue at the northern site driveway
2. Derby Street at Webb Street and the southern site driveway
3. Webb Street at Essex Street and Szetela Lane
4. Bridge Street (Route 1A) at Webb Street
5. Southern intersection of Bridge Street and Sgt James Ayube Memorial Drive
6. Northern intersection of Bridge Street and Sgt James Ayube Memorial Drive

Four of these are equipped with traffic signals, while two, which are at the site driveways, are not. The Company indicated that for construction, it would establish a primary access point at the intersection of Derby Street and Webb Street (southern site driveway), but following construction, the primary access point would be on Fort Avenue (northern site driveway) (Exh. SHR-1, at 40). Traffic counts showed that the current morning peak hour for traffic is generally 7:30 a.m. to 8:30 a.m., and that the current afternoon peak hour for traffic is 4:15 p.m. to 5:15 p.m. (*id.* at 167). Footprint projects that morning and afternoon facility construction peak hours will be 6:00 a.m. to 7:00 a.m. and 3:30 p.m. to 4:30 p.m. (*id.*).

The traffic study found that all intersections evaluated currently operate at LOS A or LOS B during peak hours (Exh. EFSB-T-8-1, at 6-7). Adding traffic from construction of the proposed Footprint facility, traffic performance at most of the intersections is projected to be LOS C or better, meaning that the delay would be up to 35 seconds for a signalized intersection and 25 seconds for an unsignalized intersection (*id.* at 6, 11).<sup>72</sup> Changes at the most affected intersections are summarized in Table 6, below.

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<sup>72</sup> The study conservatively assumed a vehicle occupancy rate of one worker per vehicle, that all workers would arrive and depart within one-hour periods, and that all would approach and depart on Webb Street (Exh. EFSB-T-8-1, at 9; Tr. 3, at 472-473). The tabulated information is based on the heaviest 15 minutes of traffic, within the peak hour (Tr. 3, at 499). Finally, the traffic consultants further indicated that eastern Massachusetts drivers are typically able to extract more capacity out of an intersection than the traffic study, which is based on national norms, would predict (*id.* at 499-500).

**Table 6. Traffic Level of Service and Delay at the Most-Affected Intersections**

| Intersection   | Level of Service/Average Delay (Seconds)        |      |  |        |
|--|---|------|--|--------|
|  | Existing Conditions (at Construction Peak Hour) |      | Construction Peak Hour, at Construction Peak |        |
|  | AM  | PM   | AM   | PM     |
| Bridge St/Webb St (signalized)   | B/13  | B/18 | E/73   | E/77   |
| Webb St/Essex St/Szetela Lane  | B/10  | A/9  | A/9  | C/32   |
| Webb St/Derby St/site driveway:  |   |      |  |        |
| Eastbound Webb St traffic turning left onto Derby St* at site driveway | B/10  | B/12 | F/268  | F/124  |
| Traffic exiting site driveway, crossing Derby St onto Webb St.         | A/0   | A/0  | A/0  | F/>120 |

\* Only one to three vehicles is expected to make this turn at the peak construction hour.

Sources: Exh. EFSB-T-8-1, at 7, 11; Tr. 3, at 493.

As shown in the table, the LOS would deteriorate noticeably at two intersections during the peak months of construction, in the absence of any traffic mitigation. More precisely, the Company stated that without mitigation, the intersection where the southern site driveway joins Derby Street across from Webb Street is projected to be at LOS F, with modeled delays of four or five minutes for traffic turning left from Webb Street onto Derby Street in the morning, and of two minutes in the afternoon (Exh. EFSB-T-8-1, at 11; Tr. 3, at 493). The Company stated that currently in Massachusetts, only LOS F is typically considered to represent a traffic management failure requiring mitigation (Tr. 3, at 492-493). The intersection of Bridge Street and Webb Street is anticipated to change from LOS B to LOS E for both morning and afternoon peaks due to construction worker traffic (Exh. EFSB-T-8-1, at 7, 11). Both morning and afternoon peak hours are predicted to see delays at the light increase by approximately one minute (*id.*).

Footprint stated that students at the nearby Bentley Elementary School typically arrive between 7:05 a.m. and 7:25 a.m. for a 7:30 start time, and depart by bus, car, or on foot between 2:35 p.m. and 2:50 p.m. (Exh. EFSB-T-15). The Company therefore concluded that there would be little to no overlap between student arrivals in the morning and construction worker traffic, and minimal overlap for student departures in the afternoon (*id.*). The Company stated that it has not been in direct contact with the Bentley School administrators or recreation coordinators for the Bentley School fields; communication on traffic issues has only been with the City administration (Exh. EFSB-T-16; Tr. 8, at 1351). The Company stated that it will monitor the interaction between the Bentley School and construction traffic, and if some type of mitigation is warranted, a mutually agreeable plan will be developed (Exhs. EFSB-T-15; EFSB-T-16).

Three construction projects besides construction of the Footprint facility are anticipated to occur in proximity to the Salem Harbor Redevelopment site during the 2014-2016 timeframe. These projects include Algonquin's construction of a natural gas pipeline to supply the Footprint facility, a National Grid project to upgrade transmission cables extending to the project site, and a City of Salem Department of Public Works ("Salem DPW")/Massachusetts Department of Transportation ("MassDOT") road improvement project on Canal Street (RR-COS-1). Footprint's traffic consultant stated that he did not take into account the effect that any street closures from the Algonquin or National Grid projects would have on Footprint traffic impacts because the precise nature of those projects had not been established (Tr. 3, at 517). The Company acknowledged that a worst-case scenario would be one in which the preferred route for both projects is along all or part of Webb Street between Bridge Street and the project site (RR-EFSB-24). As of April 2013, Footprint suggested that National Grid's construction along part of Webb Street would be completed by May 2015, before the peak of facility construction from July 2015 to September 2015 (RR-EFSB-25). Footprint estimated that the Algonquin pipeline, also to be constructed along Webb Street, would be constructed from the second quarter of 2015 through the first quarter of 2016 (Exh. EFSB-G-46). Footprint indicated that it would participate in weekly or bi-weekly coordination meetings with the City, National Grid, and Algonquin, to address traffic issues associated with these projects (RR-EFSB-24).

b. Operational Traffic

During operation of the proposed facility, there would be approximately 50 employees, spread over three shifts, traveling to and from the site each day (Exh. EFSB-T-8-1, at 9). According to the Company, as of November 2012, the plant employed approximately 120 workers. Prior to 2011, when the plant was at full operation, it employed 175 workers (*id.*). Other traffic associated with operation of the generating facility would average five or six deliveries per day of mail, services, and supplies, and removal of one dumpster of solid waste per week (Exh. EFSB-T-4). The Company does not plan to have any routine deliveries by water during facility operations, although water delivery to replace major components would be considered (*id.*). Footprint maintained that traffic impacts during operation would be less than those associated with the current operation of the plant (Exh. SHR-1, at 166).

## 2. Mitigation

To mitigate the impact of traffic generated by construction of the proposed facility, the consultant who performed the traffic study recommended police officer control at the intersection of Webb Street, Derby Street, and the site driveway during much of the day to periodically stop through traffic on Derby Street in order to assist with the egress of vehicles leaving the site (Exh. EFSB-T-8-1, at 12; Tr. 3, at 474). The consultant suggested this mitigation measure be in place on all days in which there are more than 200 workers on site (Tr. 3, at 477-478). The Company stated that it anticipates having police officer control at the site driveway, at least on days when over 250 workers would be on the site – *i.e.*, approximately from December 2014 to February 2016 – and that it anticipates coordinating with the City during the rest of the construction period (Exhs. EFSB-T-9; EFSB-T-10).

With respect to the projected average wait times over one minute at the signalized intersection of Bridge Street and Webb Street during peak construction periods, the consultant recommended in-person monitoring of traffic by an engineer during peak construction (Tr. 3, at 519). Footprint indicated that its monitoring of this intersection would consist of contacting the City and responding to any complaints (*id.* at 475-576). In the event of slowed traffic at the intersection, the Company indicated that signal times could be adjusted, but also indicated that it would provide a police detail if warranted by actual traffic conditions (Exhs. SHR-1, at 173, n.31; EFSB-T-11). More specifically, the Company indicated that it would consider a police detail warranted if construction traffic caused queues at this intersection to block access or egress onto Bridge Street from Collins Street, Winter Street, or Conant Street, all of which are residential streets near the intersection (Exh. EFSB-T-11).

Footprint indicated that some workers could shuttle to the site by arrangement with the MassRIDES Program or the North Shore Transportation Management Association (“NSTMA”) (Tr. 3, at 511). The Company stated that it would direct its EPD contractor to partner with MassRIDES (Exh. EFSB-T-14). The Company also suggested that high gasoline prices could lead workers living at more distant locations to carpool to the site (Tr. 3, at 512).

Throughout the proceedings, the Company maintained that police officer control of the Webb Street, Derby Street, and site driveway intersection, along with monitoring of the Bridge Street and Webb Street intersection would appropriately mitigate the primary traffic impacts of its project construction. The Company indicated that it will take some additional steps, which

may involve carpooling or public transportation options (Exhs. EFSB-T-14; EFSB-T-25; EFSB-T-26; Tr. 3, at 510-513). Footprint also intends to coordinate with overlapping construction projects in the area (Exh. EFSB-T-18; RR-EFSB-24, at 2).

According to the PUD Special Permit, the Planning Board is requiring Footprint to meet weekly with representatives of National Grid, Algonquin, the Massachusetts Department of Transportation (regarding resurfacing of Canal Street), the Massachusetts Bay Transportation Authority (regarding a station and garage improvement project), and the Salem Public Works, Engineering, and Police Departments (Exh. EFSB-LU-5-2, at 8). The PUD Special Permit also requires Footprint to have traffic operations monitored by a Professional Traffic Operations Engineer during defined peak worker transit periods at four intersections: Webb Street at Essex Street and Szetela Lane; Bridge Street at Webb Street; the southern intersection of Bridge Street and Sgt. James Ayube Memorial Drive; and the northern intersection of Bridge Street and Sgt. James Ayube Memorial Drive (*id.*). In the PUD Special Permit, the City reserves the right to require Footprint to implement additional traffic mitigation such as providing incentives for carpooling and coordinating off-site parking (*id.*). Other provisions of the PUD Special Permit include a requirement that truck routes for construction materials and other deliveries be designated and approved prior to issuance of a building permit (*id.*).

Footprint proposes that construction worker parking be located on the site, and did not offer off-site parking as a traffic mitigation technique. Footprint acknowledges that off-site lots have been used in construction of other Massachusetts generating facilities; however, it notes that these lots were necessary due to lack of space on the construction site (Company Brief at 102, citing RR-EFSB-27). The Company argues that there would be no basis for the Board to require off-site parking as there is ample parking available on site and the results of the traffic study do not indicate that it is necessary (Company Brief at 102). Furthermore, the Company argues that no feasible alternative parking site has been identified (*id.*). According to the Company, workers would clock in when arriving at the off-site parking location, which per shift would reduce the amount of time workers would be on site (Tr. 10, at 1677-1678). The Company estimates that such a procedure has the potential to increase the number of workers required by up to 12 percent, extend construction hours or necessitate a second shift, and substantially increase costs (*id.*; Company Brief at 103). In addition, the Company suggests that

off-site parking would potentially cause traffic issues in the neighborhood where any off-site lots were located (Tr. 10, at 1668; Company Brief at 103).

3. Intervenors' Positions

a. City

The City raises concerns about the Company's traffic study, arguing that the model does not account for road closures and delays that may be caused by the three other construction projects anticipated in proximity to the site, and that actual conditions may not be in line with the model predictions (Tr. 3, at 516-517; Salem Brief at 10-12). The City argues that a carefully planned and executed construction plan and traffic system should be designed and implemented (Salem Brief at 14). The City recommends, as a condition of any Siting Board approval of the facility, that the Company be required to submit to the Board and all parties by November 1, 2013, a construction management and traffic management plan that: (1) acts as a shared depository among Footprint, National Grid, Algonquin, MassDOT, and Salem DPW for construction schedules; (2) provides real-time traffic data collection during construction, using traffic sensors; (3) provides a platform for Footprint, National Grid, Algonquin, and Salem DPW to coordinate construction activities; and (4) forces adjustments to schedules when necessary if an impermissible conflict arises (id. at 14-15).

Rather than having off-site parking or carpooling imposed in advance based on traffic modeling, the City prefers to have the authority to require modifications of construction traffic as the project progresses and to be able to coordinate construction traffic with locally scheduled events; thus, other than a requirement for on-going traffic monitoring, the City endorses no pre-determined road traffic flow mitigation (July 11, 2013, EFSB Meeting Tr. at 32-34, 44-47). However, the City argues for a condition requiring Footprint to work with the NSTMA, which sets up ride-shares and works to reduce area congestion (id. at 33).

The City also argues that the high volume of traffic generated by construction of the Footprint facility would damage area roads and would require roadway improvements much sooner than otherwise necessary (Salem Brief at 19-20, citing Exh. EFSB-COS-7; Tr. 7, at 1108). The City therefore requests either that Footprint and Salem enter into a CBA that addresses the issue or that the City receive compensation from the Company in the amount of \$302,510 to perform area road improvements (Salem Brief at 20).

Further, the City projects that the increase in barge traffic for facility construction, in addition to continued security responsibilities of the harbormaster related to the Footprint site, will require an additional vessel and personnel (id. at 16-17). Salem therefore requests that the Board condition the approval of the facility on a CBA being reached between the parties that addresses these concerns, or that the City receives payment by Footprint of either \$45,000 per year or a one-time payment of \$130,000 (id. at 17).

b. HDSNA/PNA

The HDSNA/PNA contends that it is not possible to adequately assess or anticipate how the Footprint Project demolition and construction phases will affect the neighborhoods, specifically noting the narrow streets and poorly configured traffic patterns in the area, and contends further that the Company's traffic studies did not take into account the narrow streets and sidewalks and the number of ferry passengers using these areas, and other pedestrian traffic during Salem's tourist season (HDSNA/PNA Brief at 3; July 11, 2013, EFSB Meeting Tr. at 108). During discovery, the group asked whether Footprint's traffic studies accounted for seasonal variations due to tourist traffic, to which the Company responded that its traffic study was based on measurements taken on a single date for each intersection – one intersection in April, four intersections in May, and one intersection in November (Tr. 8, at 1399; RR-HDSNA/PNA-1).

The HDSNA/PNA states that it would prefer having worker parking located outside of Salem, and endorses bringing workers to the site by water transport (July 11, 2013, EFSB Meeting Tr. at 108). The group argues that relying on excellent coordination alone between Footprint and other construction projects over the course of the demolition and construction phase would be insufficient to mitigate impacts on the neighbors (HDSNA/PNA Brief at 3). The HDSNA/PNA requests that Footprint be required to enter into a separate CBA with their organizations to address the specific needs and concerns of the neighborhood, including traffic, as described in Section IV.I, below (id. at 4).

4. Analysis and Findings

The record shows that Footprint would deliver major project components, large construction equipment, fill materials, and bulk construction material other than concrete by

barge or other vessel and would also remove demolition materials by vessel. The Siting Board concludes that marine traffic issues can be resolved between Footprint and the City, such as through a CBA as described in Section IV.J, below. Roadway traffic issues are more complex and necessitate specific findings by the Board.

Modeling of construction worker traffic indicates that traffic impacts would be moderate (i.e., increases in delays averaging less than one minute) except at one or two individual intersections. However, the modeling did not account for the possibility that construction of underground electric cable and underground gas line projects could occur at a time of significant traffic for facility construction and would likely occur partly on Webb Street, which is one of the roads expected to be used by workers and deliveries for Footprint. The Board shares the concern of the City and HDSNA/PNA that actual traffic impacts could be worse than those modeled due to various factors such as narrow roads, pedestrian traffic, and seasonal tourism, and could be considerably worse if multiple construction projects overlap. The Board concludes that traffic congestion could be a significant issue during Footprint's construction phase.

Besides transporting large deliveries by water, the Company has committed on the record to the implementation or investigation of the following forms of road traffic mitigation: choosing off-peak-hour delivery times for materials transported by truck; providing a police detail at the site construction driveway when 250 or more workers are on site;<sup>73</sup> monitoring of the Bridge Street and Webb Street intersection; and coordinating with the City, Algonquin, and National Grid. While these are helpful steps, the record does not conclusively show that these forms of mitigation would be sufficient to facilitate traffic flow.

The Siting Board agrees that coordination among the City, Footprint, National Grid, and Algonquin would be required if all projects are approved and are implemented in the 2014-2016 time span. The Siting Board also agrees that the need for additional mitigation, such as adjusting

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<sup>73</sup> The Siting Board notes that the Company's traffic consultant recommended a police detail when 200 workers are on site. The Board accepts the Company's proposal to use 250 workers as the criteria for a police detail at the site driveway because: (1) this issue primarily involves the workers' ability to access and leave the site, not the residents of Salem; and (2) as discussed in detail below, the Board has set up a traffic monitoring protocol where the City can mandate additional mitigation at any intersection based on the observed situation.

work hours and/or commuting routes, providing off-site parking, incentivizing carpooling, providing police details, adjusting traffic light timing, and temporary one-way/two-way street conversions, will be more apparent to the Company and to the City's police and engineers once projects are underway.

Therefore, the Siting Board directs Footprint: (1) to contact the City, representatives of the Bentley School, National Grid, and Algonquin and solicit their cooperation and participation in preparing an initial plan putting into effect a roadway and traffic mitigation system for Salem; (2) to prepare such a plan with as many of these parties as are willing to participate; (3) to submit the plan to the Siting Board and all parties by January 1, 2014; and (4) to implement the plan. The roadway and traffic mitigation system shall include the following elements: (a) a single repository of information relevant to construction scheduling, road openings, and traffic flow; (b) the provision of a traffic control officer at the Derby Street and Webb Street intersection at shift changes when there are 250 or more workers on site; (c) a plan to operate a traffic-monitoring device at the intersection of Bridge Street and Webb Street, and at any other appropriate road intersection(s), on dates when roadwork for any project or an increase in the size of the Footprint workforce might create adverse traffic flow impacts; (d) a menu of potential mitigation options, and a decision tree or other suitable approach for determining their implementation; (e) a platform for Footprint, National Grid, Algonquin, and the Salem DPW to coordinate construction activities;<sup>74</sup> and (f) a protocol for allocation of mitigation costs. In addition, the Siting Board directs Footprint to provide it with quarterly reports on its traffic monitoring, coordination with other entities, and traffic mitigation activities, from the date of this Decision to the completion of construction.

The Siting Board finds that, with implementation of the above condition, the traffic impacts of the proposed generating facility would be minimized.

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<sup>74</sup> As noted above, the City requested that the Siting Board require creation of a system that would require schedule adjustments by the City, Footprint, National Grid, and Algonquin where schedule conflicts would lead to unacceptable traffic flow impacts. The Siting Board will have an opportunity in the anticipated National Grid electrical transmission case to impose a condition requiring National Grid to participate in multi-party coordination. As an intervenor in the FERC case for the expected Algonquin gas pipeline, the Siting Board can advocate for Algonquin's participation.

I. Land Use

1. Description

As described in Section I.A, the proposed project would be located at 24 Fort Avenue, Salem, Massachusetts, on 20 acres of a 65-acre parcel that has been used for power generation since 1951 (Exh. SHR-11, at 1-1, 1-2). As discussed in Section IV.D, Footprint has committed to demolish all existing structures on site not slated for reuse and remediate the site in accordance with the MCP.

Footprint stated that the parcel is located in the Industrial Zoning District and is also located in the Wetland and Flood Hazard Overlay District (Exh. SHR-1, at 176). Consequently, construction of the facility would require a special permit from the Salem Planning Board (*id.*). On April 8, 2013, Footprint filed applications for a PUD Special Permit (Exh. SHR-16). The Company testified that the PUD Special Permit covers the entire 65-acre parcel with the exception of 1.1 acres that is zoned residential (Tr. 8, at 1315). The Company explained applying for a PUD Special Permit provided the project with more flexibility with respect to zoning issues such as lot-coverage, setback, and parking dimensional requirements (*id.* at 1299).<sup>75</sup> The Company also applied to the City's Zoning Board of Appeals ("ZBA") for a special permit for an essential services use and a height variance from the maximum building height of 45 feet (Exh. SHR-1, at 177; Tr. 8, at 1299).<sup>76</sup>

The PUD Special Permit was issued on August 1, 2013, with numerous conditions including the implementation of a CBA between the City and the Company that incorporates, at

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<sup>75</sup> For example, Footprint testified that in the context of the entire 65-acre parcel, the project would conform to a Salem zoning ordinance limiting impervious surfaces to 45 percent, but taken as only the 20-acre site, the project would not comply. (The impervious surfaces of the new facility would constitute 55 percent of the 20-acre project site but only 17 percent of the 65-acre parcel) (Exh. SHR-1, at 177; Tr. 8, at 1300).

<sup>76</sup> On June 28, 2013, the ZBA issued a decision approving Footprint's petition for a special permit for an essential services use and to exceed the maximum allowable height allowance of 45 feet in an Industrial Zoning District (Exh. EFSB-LU-5-S1). The ZBA decision was appealed to the Superior Court for Essex County on July 17, 2013, pursuant to the provisions of G.L. c. 40A, § 17, and was assigned Civil Action Number 2013-1130A. Petition of Footprint Power Salem Harbor Development LP for Certificate of Environmental Impact and Public Interest EFSB 13-1, at 2, and Appendix A (2013).

a minimum, shared use of the existing port facility on the site (Exh. EFSB-LU-5-S2, at 10). The CBA may include dollar figures for mitigation. The Company argues that it is not appropriate for the Siting Board to require a project proponent to pay a specific dollar amount for either itemized or total mitigation as part of a CBA (Company Reply Brief at 1). Instead, Footprint proposes a condition that requires the Company to negotiate in good faith to reach a CBA with the City, with the Siting Board as the ultimate arbitrator of what constitutes a reasonable CBA in the event that Footprint and the City cannot agree on terms (*id.*).

Footprint stated that of the 20 acres of the project site, seven acres will be landscaped vegetation with ten-foot wide paths located on the west and south sides of the berm (Exh. SHR-16, at 38). The Company described how this area will provide public access opportunities to the site, including a public viewing opportunity/corridor to the Salem Harbor, consistent with the site's DPA location, as discussed in Section IV.C, and future industrial uses (Exh. SHR-11, at 6-8). Footprint testified that the easement for the natural gas pipeline was sited so that the breach in the berm would occur on the east side of the facility. Consequently, there could be uninhibited public access along the south side of the facility (Tr. 9, at 1599-1600). As a condition of the City's Planning Board approval, Footprint is required to provide public access to the end of the jetty in the form of a permanent easement to the City or its designee or a similar arrangement. The City stated that it would work with the Company and relevant state agencies to pursue amendments to the Salem Harbor Plan and the site's DPA status to facilitate public access, if necessary (Exh. EFSB-LU-5-2, at 10). Footprint testified that any place the public would have access to the site would meet or exceed the access requirements of the MCP (Tr. 8, at 1446).

As discussed in Section IV.C, Footprint stated that most of the parcel is within the Salem Harbor DPA (Exh. SHR-1, at 2). The Company explained that it intends to seek a variance from Section 9.32 of the Waterways Regulations (310 C.M.R. 9.32(1)(b)), which restricts fill and structure in DPAs to marine industrial uses (Exh. SHR-11, at 6-1). Footprint stated that the most recently updated municipal harbor plan (the 2008 Salem Harbor Plan) envisioned that the site would continue to be suitable for energy production for the foreseeable future (Exh. SHR-1, at 104).

As described in Section I.A, the parcel is bordered by the SESD treatment plant, Salem Harbor, the Blaney Street ferry terminal, several mixed-use buildings, and by Derby Street and

Fort Avenue, with residential uses directly across the street, as well as the Bentley Elementary School ballfields (Exh. SHR-1, at 174, 176). The Company stated that the proposed generating facility site boundary is 50 feet away from the closest residence (Exh. EFSB-LU-13).

Footprint indicated that it anticipates no impact on historical or archeological resources as a result of the project (Exhs. SHR-1, at 183; EFSB-LU-8).<sup>77</sup> The Company testified that it has met with members of the Historic Derby Street Neighborhood Association as well as representatives from the House of the Seven Gables (Tr. 8, at 1311). Footprint stated that the project would not impact any federally or state rare species habitat (Exhs. SHR-1, at 183-184; EFSB-LU-9-3). Footprint indicated that the site of the proposed power plant is composed of artificial fill on top of native soil material and bedrock (Exh. SHR-1, at 174-175).

The Company stated that although the project will occupy only 20 acres, significant portions of the 65 acres will be used for construction laydown and temporary construction offices, so any future development of the remainder of the site will necessarily lag behind the construction of the proposed facility (Tr. 8, at 1282). To the extent that there is additional time between the completion of the proposed facility and the development of the remainder of the parcel, Footprint committed to provide site security and maintenance for the remaining area (id. at 1283).

Footprint asserted that an application that used waste heat generated by the proposed facility would end up resulting in a net decrease in the efficiency of the facility (Tr. 9, at 1626-1628). The Company testified that in the future it will continue to explore the potential for a new combined heat and power plant on the parcel that could reduce the amount that Footprint runs its auxiliary boiler (Tr. 8, 1296).

Footprint stated that plans for the redevelopment of the remainder of the parcel have not yet been created (Exh. EFSB-LU-20). The north portion of the site also includes the existing

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<sup>77</sup> Footprint stated that a review of the National and State Register files and the Inventory of Historic and Archaeological Assets of the Commonwealth was undertaken at the Massachusetts Historical Commission and revealed no previously identified historic or archaeological resources within the project site (Exh. SHR-1, at 183). Furthermore, the Company testified that the Massachusetts Historical Commission reviews all Environmental Notification Forms, which are filed as part of the MEPA process, and the Commission did not provide comments to MEPA during the public comment period for this project (Exh. EFSB-LU-8).

turbine building, the structural frame of which the Company is evaluating for potential use, as discussed in Section IV.D. The Company stated that it would make a final decision on the reuse of the turbine building by the end of 2013 (Tr. 8, at 1280-1281). The Company stated that it envisioned that potential tenants could include a large industrial tenant or a publicly accessible venue for uses such as art exhibits (id. at 1291). Footprint testified that in general the northeast portion of the site is best suited for industrial uses since is it adjacent to the SESD treatment plant (id. at 1294).

The Company stated that possible reuses for the southern portion of the site include the reuse of the wharf, particularly for cruise ship traffic, as well as small “artisanal” manufacturing and marine storage/warehouse facilities (Exh. EFSB-W-16; Tr. 8, at 1281). Footprint testified that it is in negotiations with the City to grant it long-term access to the wharf to allow cruise traffic and that it could be possible for a cruise ship to come in as a “proof-of-concept” during demolition and construction, but that regularly scheduled cruise traffic would not begin until after facility construction is complete (Tr. 3, at 455; Tr. 8, at 1330).<sup>78</sup>

## 2. Intervenors’ Positions

Overall, the City “wholeheartedly supports the Footprint project” (Salem Brief at 6). Mayor Driscoll states that the City hopes to have a cruise port on the site and to activate the waterfront with other types of vessels (July 11, 2013, EFSB Meeting Tr. at 21, 23). The City opposes multiple CBAs (id. at 35). The City argues that all the stakeholders can have involvement in negotiating the CBA through its stakeholder group, and that the group can reach a stronger agreement together rather than negotiating separate CBAs (id. at 36).

The HDSNA/PNA has reservations about the proposed project and is particularly concerned about safety issues related to public access, as discussed in Section IV.G (HDSNA/PNA Brief at 1-2). The HDSNA/PNA advocates that the Company enter into a

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<sup>78</sup> In July 2013, the City filed with MEPA a Notice of Project Change to the Salem Port Expansion to make improvements to the Footprint Power Marine Terminal for cruise berthing and to create a pedestrian access way between the marine terminal and adjacent Salem Wharf Project site at 10 Blaney Street that would comply with the Americans with Disabilities Act. The filing lists the project start date as January 2014 with a completion date of Spring 2014.

separate CBA with the neighborhood associations in order to address the neighborhoods' distinct concerns (*id.* at 4). The HDSNA/PNA argues that while the groups will continue to participate in the larger CBA process, they have separate concerns that are not necessarily well represented as part of the larger process. Additionally, the HDSNA/PNA argues that sometimes it makes sense to have separate CBAs for the City and nongovernmental groups to allow benefits like special employment opportunities that are more difficult for a municipal government to negotiate (July 11, 2013, EFSB Meeting Tr. at 112-113).<sup>79</sup>

### 3. Analysis and Findings

The record establishes that the proposed facility is consistent with the historic use of the parcel for power generation. The parcel is located in the Industrial Zoning District, which permits power generation uses, and the most recent Salem Harbor Plan envisioned continued energy production on the site. The record also indicates seven acres of the proposed project's 20-acre footprint would be landscaped area with public access. The Board notes that this would provide a public benefit. The record indicates that the City's Planning Board is the arbitrator of the PUD Special Permit. The Board notes that the PUD special permit requires the implementation of a CBA between the Company and the City. Accordingly, the Siting Board directs the Company to enter into a CBA, and to file with the Board for review any executed CBA(s). Except as required in Board conditions above, the Siting Board does not dictate the terms of this CBA, nor whether additional CBAs beyond the one with the City are necessary.

The parcel is surrounded by a variety of uses, including a residential neighborhood and an elementary school. The proximity of the proposed facility to these land uses has implications with respect to air, visual, noise, and traffic issues considered herein. The Siting Board has found above (*see* Sections IV.B, IV.E, IV.F, IV.H) that with the mitigation measures proposed by the Company and/or imposed as conditions to this decision, air, visual, noise, and traffic

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<sup>79</sup> The Board notes that both the HDSNA and the PNA are unincorporated associations. Therefore, even if one or both of them entered into a contract with Footprint, neither the HDSNA nor the PNA could bring a civil action to enforce the terms of that contract. Save the Bay, Inc. v. Department of Public Utilities, 366 Mass. 667, 675 (1975) ("It is a well established principle that an unincorporated association cannot be a party to litigation").

impacts would be minimized. The record indicates that there will be no significant adverse impact by the project on historical or archeological resources or rare species habitat.

The Company has not yet developed plans for the remainder of the 65-acre parcel beyond the 20-acre project site. In the Sithe Edgar Decision at 113-117, the Board required the company to develop and coordinate plans with municipal and state officials regarding public access on portions of the parcel beyond the facility. The Board additionally required landscaping for visual mitigation on some portions of this area of the parcel. The Siting Board directs Footprint to continue coordinating with the City and other stakeholders to develop plans for the remaining 45 acres of the site, including public access as appropriate, and to submit all Notice of Project Change filings under MEPA to the Siting Board. The record indicates that Footprint will be responsible for the maintenance, appearance, and security of the entire parcel until it is redeveloped. The Siting Board therefore directs the Company to work with the City and other stakeholders to develop plans for maintenance, security, and overall conditions for the remaining 45 acres until those acres are developed, and to file those plans with the Siting Board for approval, and with the City, three months prior to commercial operation of the facility.

The Siting Board finds that, with implementation of these conditions, the land use impacts of the proposed generating facility would be minimized.

#### J. Cumulative Health Impacts

This section describes the cumulative health impacts of the proposed facility. The Siting Board considers the term “cumulative health impacts” to encompass the range of effects that a proposed facility could have on human health due to exposure to noise, electromagnetic fields (“EMF”) and substances emitted during construction and operation of the facility, as well as possible effects on human health unrelated to substances. The Siting Board considers these effects in the context of existing baseline health conditions and existing background conditions and, when appropriate, likely changes in the contributions of other major emissions sources. PVEC Decision at 339; Brockton Power Decision at 244; Sithe Mystic Decision at 189-190.

##### 1. Baseline Health Conditions

Footprint provided a summary of asthma prevalence and cancer incidence study findings for Salem, available from the Massachusetts Department of Public Health (“MADPH”)

(Exh. EFSB-H-2).<sup>80</sup> For asthma prevalence among adults for 2003-2007, North Shore communities as a group had an asthma prevalence rate of 10.2 percent, compared to a statewide rate of 9.8 percent (id.).<sup>81</sup> Salem rates for “all cancers” for 2004-2008 are not significantly elevated above the average for Massachusetts; however, male lung and bronchial cancer, combined, and leukemia in males exceed statewide averages (id.).

## 2. Criteria Pollutants

Footprint used the NAAQS for SO<sub>2</sub>, particulate matter, NO<sub>2</sub>, CO, ground-level ozone, and lead as criteria to evaluate potential health impacts of its potential air emissions (Exh. EFSB-H-3-1, at 1). The NAAQS are intended to be protective of members of the general population, including potentially susceptible individuals (id.; Tr. 5, at 810, 855). Footprint stated that Massachusetts is rated as meeting standards for these criteria pollutants. As further discussed in Section IV.B, above, the Company’s modeling of background levels of these pollutants plus project impacts indicates that cumulative predicted air quality concentrations are below the applicable NAAQS (Exh. EFSB-H-3-1, at 7). In addition, emissions of ozone precursors would be limited by NO<sub>x</sub> controls and fuel technologies as described in Section IV.B, above, in accordance with health-based MassDEP and USEPA regulations.

Health impacts associated with criteria pollutants from the facility are a primary concern of the HDSNA/PNA. The HDSNA/PNA argues that “continuing to burn any fossil fuels in our locale will exacerbate the already high rates of asthma and associated cardiac disease prevalent in our community” (HDSNA/PNA Brief at 2). The HDSNA/PNA further argues that statistics point to a compounding effect of fossil fuel emissions on people already suffering from asthma

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<sup>80</sup> The Company provided 2007-2009 pediatric asthma rates as reported through Salem schools to MADEP, along with a comparison to statewide reports (Exh. EFSB-H-2). However, such a comparison may be of limited value because, as MADPH indicates, there may be reporting inconsistencies in the underlying data. The Siting Board requests that future power plant applicants provide all available asthma data for the geographic area of interest.

<sup>81</sup> For purposes of evaluating adult asthma rates, the North Shore includes the cities and towns within the North Shore Community Health Network: Salem, Marblehead, Swampscott, Nahant, Lynn, Saugus, Lynnfield, Peabody, Danvers, Beverly, Wenham, Hamilton, Topsfield, Ipswich, Essex, Manchester-by-the-Sea, Gloucester, and Rockport (Exh. EFSB-H-2).

and heart problems (*id.*). The HDSNA/PNA concludes that having yet another fossil fuel burning power plant will serve to significantly increase health risks to all Salem residents and especially to the disproportionately impacted, the Environmental Justice community of the Point Neighborhood (*id.*). In support of these arguments, the HDSNA/PNA cites to record evidence from the Company stating that the types of criteria pollutants that would be emitted by the facility have been linked to an increased risk of cardiorespiratory health outcomes, including asthma symptoms, emergency room visits, and hospital admissions for respiratory illnesses and premature mortality (*id.* at 2-3, *citing* EFSB-H-3-1).

CLF argues that Footprint's primary witness on the topic of health, Dr. Peter Valberg, is "an outlier who holds views [about whether there is a no-effects threshold for non-cancer effects] that are at odds with the majority of the scientific community" (CLF Brief at 18). Dr. Valberg expressed a view that there is likely to be a threshold level of exposure to PM<sub>2.5</sub> below which there is no adverse effect (Tr. 5, at 861-865). Dr. Valberg indicated that toxicologists tend to think that there is such a threshold, while statisticians tend to think that there is no such threshold. He asserted that there is evidence for a threshold but that the point is essentially unknowable.

Evidence presented in this case is insufficient for the Siting Board to determine whether or not there are residual adverse health effects at PM<sub>2.5</sub> concentrations below the NAAQS, or from other criteria pollutants below their respective standards. However, the record does show that the NAAQS are set to be broadly protective of health and that the Footprint facility would meet the NAAQS. These health-based standards are meant to be protective of populations including those of concern to the HDSNA/PNA. Furthermore, as modeled, the locations of greatest modeled impacts of criteria pollutants are on the Footprint site itself or in adjacent waters, and are not in residential areas, as described in Section IV.B.1.c, above. Additionally, there was no additional mitigation – such as increasing stack height, evaluated above in Section IV.B.1 – that would further reduce pollutant concentrations within an overall favorable balance of costs and impacts. However, in Section IV.B, above, the Siting Board directed the Company to contribute to an off-site emission reduction program. Accordingly, the Siting Board finds that the health impacts of criteria pollutants would be minimized.

### 3. Air Toxics

Footprint calculated a toxicological hazard index and a cancer risk level for a hypothetical person breathing air throughout the year at the point of highest airborne concentrations modeled from stack emissions, for a period of 30 years (Exh. EFSB-H-3-1, at 12). Footprint stated that such a calculation is conservative relative to real exposures (*id.* at 13). On this basis, Footprint calculated a hazard index<sup>82</sup> of 0.08 for all air toxics, combined, and including background levels; 0.08 is well below one so non-cancer health effects would not be anticipated (Exh. EFSB-H-1, at 15). With the same worst-case exposure, and again including background levels, Footprint calculated a cancer risk of  $1.1 \times 10^{-7}$ , which is lower than the range of  $10^{-6}$  to  $10^{-4}$  normally considered acceptable by USEPA (*id.* at 15). In both risk calculations, the preponderance of the risk is from background sources, rather than emissions modeled from the facility. We also note that the proposed facility would meet the Siting Board's TPS emissions criteria, which address a number of air toxics. Accordingly, the Siting Board finds that the health impacts of non-criteria pollutants would be minimized.

### 4. Discharges to Ground and Surface Waters

The Company stated that the generating facility's wastewater would be discharged to the SESD, and that SESD has sufficient capacity to receive the wastewater. Concrete containment areas would be installed under and around electrical equipment and tanks housing fuels and oils, with runoff from these areas directed to oil/water separators prior to discharge (Exh. SHR-1, 163-165; Tr. 3, at 569-570). Also, the Company stated that its stormwater management plan complies with MassDEP's Stormwater Management Standards, as discussed in Section IV.C. The evidence shows that wastewater and storm water would be appropriately managed. Accordingly, the Siting Board finds that the health impacts of discharges to ground and surface waters would be minimized.

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<sup>82</sup> Toxicologists calculate a hazard index to assess non-cancer risks. Adverse health impacts are not anticipated when a hazard index is less than one, due to safety margins built into the calculation.

#### 5. Noise

As discussed in Section IV.B, above, the Company has proposed to implement noise mitigation at the generating facility sufficient to keep increases at residential receptors, due to facility operations, to six dBA or less, which the Company project would result in total noise up to 49 dBA (Exh. EFSB-NO-2-S). The record contains no evidence that such noise levels would present health concerns. Noise during construction may be louder, but the Company has committed to measures including installation of a temporary sound wall.

In Section IV.F, the Siting Board found that, with implementation of the Company's proposed mitigation measures and a condition imposed by the Siting Board, noise impacts of construction and operation of the proposed facility would be minimized, consistent with minimizing cost. Accordingly, the Siting Board finds that the health effects, if any, of noise from the proposed facility would be minimized.

#### 6. Handling and Disposing of Hazardous Materials

In Section IV.D, above, the Siting Board reviewed the Company's plans for storage and handling of hazardous materials, including 19 percent aqueous ammonia and limited amounts of industrial chemicals for facility maintenance and operation. Section IV.D also outlines the Company's plans for minimizing and responding to accidental releases of oil and other hazardous materials. The record shows that the Company will establish plans for minimizing and responding to accidental releases. The Siting Board finds that, with implementation of the conditions set forth in Section IV.D, above, the health impacts related to the handling and disposal of hazardous materials, including ammonia, would be minimized.

#### 7. EMF

As discussed in Section I.A, above, power from the proposed facility would be transmitted via a new interconnection to the existing 115 kV substation located on property within the 65-acre parcel. Footprint estimated that operation of this new interconnection would result in a one milligauss ("mG") increase in the magnetic field at the closest residence (Tr. 5, at 785-786). In addition, operation of the facility would affect magnetic fields from the four transmission lines that interconnect at the electrical substation – two extending underground into Salem and two extending overhead to other North Shore locations. The magnetic fields from

these four lines depends on dispatch elsewhere in New England (i.e., whether power is flowing north or south along the North Shore), and on generation at Salem Harbor. The effect of the Footprint facility on these magnetic fields would be less than the effect of the four generating units now at Salem Harbor, because the generation capacity of Footprint is lower than the combined capacity of the four Salem Harbor units. The one mG effect of the interconnection line, at one residence, is a small increment compared to increases in levels projected for many transmission facilities approved by the Board.

The Siting Board has found that although some epidemiological studies suggest a statistical correlation between exposure to magnetic fields and childhood leukemia, there is no evidence of a causal relationship between magnetic field exposure and human health. PVEC Decision at 342; Southern Energy Kendall Decision at 385-386; Sithe Mystic Decision at 198-199. The proposed project would not create a significant increase in magnetic field at off-site locations. The record shows, however, that final interconnection plans have not been determined. Because the proposed project could contribute to higher power flows on area transmission lines, the Siting Board seeks to remain informed about Footprint's interconnection plans and any associated transmission upgrades as they may relate to EMF impacts. In prior cases, the Siting Board has directed applicants to report to the Board regarding the progress and the outcome of the Company's interconnection plans and on designs for any transmission upgrades, as well as any measures incorporated into transmission upgrade designs to minimize magnetic field impacts, within two weeks of reaching a final agreement with transmission providers regarding interconnection. In this case, a petition to replace cables to the substation at the power plant has been filed separately with the Siting Board, and will evaluate EMF impacts of the cables; notification by Footprint of final interconnection plans would be duplicative. Therefore, the Siting Board does not require EMF reporting from Footprint.

The Siting Board finds that health effects of the proposed facility related to EMF would be minimized.

#### 8. Conclusion on Cumulative Health Impact

The record shows that the NAAQS are set to be broadly protective of health and that the Footprint facility would meet the NAAQS, and the Board found that with a Company contribution to an off-site emissions reduction program, health impacts of criteria pollutants

would be minimized. Additionally, the record shows that impacts from air toxics would be minimized; that wastewater, stormwater, and hazardous materials would be managed appropriately; that noise impacts would be minimized; and that the facility would not create significant increases in off-site magnetic fields. Consequently, the Siting Board finds that there is no evidence that the proposed facility would exacerbate existing health problems in the communities surrounding the proposed facility. The Siting Board finds that cumulative health impacts would be minimized.

K. Conclusions on Environmental Impacts

Based on the information in Sections IV.B through J, above, the Siting Board finds that the Company's description of the proposed project and its environmental impacts is substantially accurate and complete.

In Section IV.B, the Siting Board found that with the implementation of an SF<sub>6</sub> plan, the off-site emission reduction program funding condition, and the diesel retrofit condition, the air quality impacts of the proposed facility would be minimized.

In Section IV.C, the Siting Board found that the water-related impacts of the proposed facility would be minimized.

In Section IV.D, the Siting Board found that with the implementation of the condition that demolition and remediation be completed by December 2016 and the submission of a recycling plan and report, the hazardous and solid waste impacts of the proposed facility would be minimized.

In Section IV.E, the Siting Board found that with the submission of the final landscaping plan, the implementation of the offsite visual mitigation condition, and the facility appearance condition, the visual impacts of the proposed facility would be minimized.

In Section IV.F, the Siting Board found that with the creation of a noise monitoring protocol, the restriction of noisy work to certain hours, the adoption of a worker vehicular noise mitigation policy, the creation of an outreach plan for project construction, and the erection of a temporary sound wall, the noise impacts of the proposed facility would be minimized.

In Section IV.G, the Siting Board found that with the development of an Emergency Response plan in conjunction with the City and the HDSNA/PNA, and the implementation of a

plan to enable all required inspections, the safety impacts of the proposed facility would be minimized.

In Section IV.H, the Siting Board found that with the implementation of the traffic coordination condition, the traffic impacts of the proposed facility would be minimized.

In Section IV.I, the Siting Board found that with the implementation of the conditions regarding future development of the remainder of the site and site maintenance, the land use impacts of the proposed facility would be minimized.

In Section IV.J, the Siting Board found that the cumulative health impacts of the proposed facility would be minimized.

Accordingly, the Siting Board finds that, with implementation of the above-listed conditions, the Company's plans for the construction of the proposed generating facility would minimize the environmental impacts of the proposed facility consistent with the minimization of costs associated with the mitigation, control, and reduction of the environmental impacts of the facility. In addition, the Siting Board finds that an appropriate balance would be achieved among conflicting environmental concerns as well as between environmental impacts and costs.

## V. CONSISTENCY WITH THE POLICIES OF THE COMMONWEALTH

### A. Standard of Review

G.L. c. 164, § 69J¼ requires the Siting Board to determine whether the plans for construction of a proposed generating facility are consistent with current health and environmental protection policies of the Commonwealth and with such energy policies of the Commonwealth as are adopted by the Commonwealth for the specific purpose of guiding the decisions of the Siting Board. The health and environmental protection policies applicable to the review of a generating facility vary considerably depending on the unique features of the site and technology proposed. In this section, the Siting Board summarizes the health and environmental protection policies of the Commonwealth that are applicable to the proposed facility and discusses the extent to which the proposed facility complies with these policies.

## B. Environmental Justice

### 1. Background

In 2002, the EJ policy was promulgated by the EOEA, the predecessor to EOEEA, pursuant to its statutory mandate to “develop policies, plans, and programs for carrying out [its] assigned duties” (G.L. c. 21A, §2; Exh. SHR-1, at 189). Pursuant to the policy, an EJ area is a neighborhood in which the median household income is below 65 percent of the statewide median income for Massachusetts, or one in which 25 percent of the residents are *either* minority, foreign born, or lacking in English proficiency (*id.*). A map of EJ areas near the parcel is provided in Figure 5.4-2 of the Petition (*id.* at Figure 5.4-2).

The EJ policy contains a set of procedures to be followed by project proponents to enhance public participation when projects are proposed to be located in or near an EJ area (Exh. SHR-1, at 189). The EJ policy requires enhanced public participation for a project that exceeds an Environmental Notification Threshold for air and is within five miles of an EJ population (*id.*). The proposed facility meets both of these criteria (*id.* at 190).

When the EJ policy was issued, the Siting Board was under the jurisdiction of the Office of Consumer Affairs, not EOEA. Brockton Power Decision at 256. The policy explicitly stated that it was not applicable to the Siting Board. Brockton Power Decision at 256-257. The Siting Board later came under the jurisdiction of EOEA’s successor, EOEEA, on April 11, 2007. Brockton Power Decision at 257; G.L. c. 164, § 69H.<sup>83</sup> All of the Parties that addressed the EJ issue assumed that said policy was one of the “current health and environmental protection policies of the Commonwealth” referred to in section 69J¼ (Exh. EFSB-SS-1; Company Brief at 36; CLF Brief at 10; HDSNA/PNA Reply Brief at 1). No one argued to the contrary. The Board intends to comply with EJ policy now and in the future. Brockton Power Decision at 258-259.

### 2. Compliance with Environmental Justice Policy

The EJ Policy is largely procedural in nature, requiring enhanced outreach and public participation. Brockton Power Decision at 258. In compliance with the EJ policy’s stated intent

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<sup>83</sup> The Siting Board was brought within the jurisdiction of EOEEA pursuant to the Statutes of 2007, Chapter 19, entitled: “An Act reorganizing the Governor’s Cabinet and certain agencies of the Executive Department.”

to enhance outreach to minority and disadvantaged groups, the Company translated the Notice of Public Hearing/Notice of Adjudication (“Notice”) into Spanish and Portuguese. In addition to publishing the Notice in English for three consecutive weeks in both the Salem Evening News and the Boston Globe, the Company also published the Notice in Spanish in El Mundo, a weekly Spanish newspaper for metropolitan Boston and the Merrimack Valley, for three consecutive weeks (Doukas Affidavit at 1). Furthermore, several weeks prior to the public hearing in Salem, the Company hand-delivered the Spanish and Portuguese and English versions of the Notice for posting at the following locations, all within the City: the Office of the City Clerk in Salem City Hall; the Salem Public Library on Essex Street; the Salem Housing Authority, located on Charter Street; the North Shore Community Development Coalition, located on Lafayette Street; and ABE/ESOL Training Resources of America, located on Federal Street (Doukas Affidavit at 2). In addition, the Company mailed the Notice in English, Spanish, and Portuguese to the Department of Planning and Community Development in Salem (Doukas Affidavit at 2). Finally, on September 4, 2012, the Company mailed a copy of the Notice in all three languages, along with a “Please Read” cover letter also in all three languages, to the owners of all property abutting the 65-acre site boundaries, owners of land directly opposite the site on any public or private street or way, and abutters to abutters within 300 feet of the site boundaries, as those owners appear on the most recent applicable tax list (Doukas Affidavit at 2).

Given these extensive outreach efforts by the Company, the Siting Board finds that the Company has complied with the Environmental Justice Policy.

C. The Global Warming Solutions Act

As noted above, this is the first generating facility in which the petition was filed with the Siting Board after the GWSA was enacted in August 2008. The Clean Energy and Climate Plan issued in 2010, developed pursuant to the GWSA, sets a 25 percent reduction requirement from 1990 levels of GHGs by 2020 and an 80 percent reduction by 2050 in the economy-wide Massachusetts GHG emissions inventory (Exh. SHR-17, at 10, CLF Comments at 2).<sup>84</sup>

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<sup>84</sup> The Massachusetts Climate Dashboard indicates that electric generation GHG emissions in the Massachusetts inventory are already 25 percent below 1990 levels (Company Reply Brief at 14, n.14; CLF Brief at 2).

Furthermore, the GWSA also amends G.L. c. 30, § 61, to require that when issuing permits, licenses, or other approvals for projects subject to MEPA, the issuing agency consider reasonably foreseeable climate change impacts, including GHG emissions, and effects such as predicted sea level rise.

The Company's compliance with the GWSA and the Climate Plan with respect to air emissions has been addressed above in Section IV.B. As noted above, the Company must contribute \$300,000 to the City for projects aimed at reducing the emissions of GHGs and particulate matter. Furthermore, the predicted rise in sea level has been addressed above in Section IV.C.4.

The Company, however, has taken additional measures to minimize its carbon emissions in accordance with the policies embodied in the GWSA. Specifically, the Administration Building is designed to meet the Massachusetts Stretch Energy Code and Leadership in Energy and Environmental Design certification requirements (Exh. SHR-11, at 3-4). In addition, the Administration Building would be constructed within the berm (Exhs. SHR-7, at 6-31; SHR-11, at Figure 1-5). The earth surrounding the Administration Building combined with a planted green roof would insulate the building, retaining heat in the winter and shielding the building from heat in the summer (Exh. SHR-7, at 6-31). Both the Administrative Building and the Operations Center would use geothermal heat pumps for heating and cooling (Exh. SHR-11, at 3-3). Finally, the Company plans that the steam turbine generation building roof and/or some of the building louvers will be equipped with photovoltaic panels (Exh. SHR-11, at 3-3; Tr. 8, at 1294-1295).

Consequently, for the reasons stated immediately above and in Section IV.B.1.h, above, the Siting Board finds that construction and operation of the proposed facility is consistent with the GWSA.<sup>85</sup>

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<sup>85</sup> The Secretary's Certificate on the FEIR states that "the project that is proposed is consistent with air quality regulations and GHG policies, the FEIR demonstrates consistency with BACT for GHGs, and it includes innovative building designs and a renewable energy component."

D. Consistency with Other Policies of the Commonwealth

In Sections II and IV, above, the Siting Board has reviewed the process by which the Company sited and designed the proposed facility, and the overall environmental and health impacts of the proposed facility as sited and designed. As part of this review, the Siting Board has identified a number of Commonwealth policies applicable to the design, construction, and operation of the proposed facility. These policies, except for the ones discussed above, and the Company's compliance therewith, are summarized below.

As discussed in Section IV.B, above, the MassDEP, in conjunction with the USEPA, extensively regulates emissions of criteria and non-criteria air pollutants from new sources such as the proposed facility. In addition, Section IV.B addresses the use of diesel retrofits for construction equipment as a condition of approval and the effect of the stack height on air quality. The Company has demonstrated that operation of its proposed facility, with the conditions imposed, would comply with all applicable MassDEP and USEPA standards.

As discussed in Section IV.C, above, the MassDEP, in conjunction with the USEPA, extensively regulates various environmental issues related to water, as well as construction in wetlands and waterway areas. The Company has demonstrated that construction and operation of the facility would comply with MassDEP and USEPA standards in this regard.

As discussed in Section IV.F, above, the Company has addressed operational and construction noise, which is particularly sensitive in this case because the facility would be located next to a residential neighborhood. As part of the Board's approval of the petition, the Board directed the Company to develop an operational noise protocol, has imposed restrictions on the hours when noisy construction may take place, and has required the erection of a temporary sound wall. With these conditions, the construction and operation of the facility will be consistent with the policies of the Commonwealth regarding noise impacts.

E. Conclusion with Respect to Consistency with Policies of the Commonwealth

Accordingly, for the reasons set forth above, the Siting Board finds that plans for construction of the proposed facility are consistent with current health and environmental protection policies of the Commonwealth and with such energy policies of the Commonwealth as have been adopted for the specific purpose of guiding the decisions of the Siting Board.

## VI. DECISION

The Siting Board's enabling statute directs the Siting Board to implement the energy policies contained in G.L. c. 164, §§ 69H-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. Section 69J¼ requires that, in its consideration of a proposed generating facility, the Siting Board review, inter alia, the site selection process, the environmental impacts of the proposed project, and the consistency of the plans for construction and operation of the proposed project with the environmental policies of the Commonwealth.

In Section II, above, the Siting Board found that Footprint provided an accurate description of its site selection process and that the Company's site selection process contributed to minimizing the environmental impacts of the proposed facility.

In Section III, above, the Siting Board found that the Company's technology selection on balance contributes to a reliable, low-cost, diverse regional energy supply with minimal environmental impacts.

In Section IV, above, the Siting Board found that with the implementation of the listed conditions relative to air, hazardous and solid waste, visual, noise, safety, traffic, and land use, plans for the construction of the proposed generating facility would minimize the environmental impacts of the proposed project consistent with the minimization of costs associated with the mitigation, control, and reduction of the environmental impacts of the proposed project.

In Section V, above, the Siting Board found that the plans for the construction of the proposed generation facility are consistent with current health and environmental protection policies of the Commonwealth, and with such energy policies of the Commonwealth as have been adopted by the Commonwealth for the specific purpose of guiding the decisions of the Siting Board.

Accordingly, the Siting Board finds that, upon compliance with the conditions set forth above and listed below, the construction and operation of the proposed generating facility will provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Accordingly, the Siting Board APPROVES the petition of Footprint Power Salem Harbor Development LP to construct a 630 MW natural gas-fired, quick-start, combined-cycle facility at

the present location of the Salem Harbor Station in Salem, Massachusetts, subject to the conditions below.

- A. The Siting Board directs the Company to submit a compliance filing containing the draft air permit and a thorough explanation of the higher emission rates associated with duct firing.
- B. The Siting Board directs Footprint to ensure that its SF<sub>6</sub> mitigation approach shall be at least as stringent as measures currently used by National Grid.
- C. The Siting Board directs Footprint to consult with National Grid and develop a joint comprehensive SF<sub>6</sub> reduction plan in connection with the anticipated National Grid upgrades to the Salem Harbor Substation. Footprint shall file the joint plan as a compliance filing to the Siting Board prior to operation of the proposed project.
- D. The Siting Board directs the Company to contribute at least \$300,000 to the City of Salem either through the Community Benefits Agreement or another mechanism dedicated to the development of an off-site emission reduction program targeted to greenhouse gases and PM<sub>2.5</sub>, among other air pollutants. Footprint, with the assistance of the City, shall prepare a report detailing the activities that are to be funded by the off-site emissions reduction program, including the costs, timeframes, and anticipated environmental benefits of the identified projects, to be submitted to the Siting Board within one year of operation of the proposed facility.
- E. The Siting Board directs that all diesel-powered non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of project construction have USEPA-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies (to the extent that they are commercially available) installed on the exhaust system side of the diesel combustion engine. Prior to the commencement of construction, the Company shall submit to the Siting Board certification of compliance with this condition and a list of retrofitted equipment, including type of equipment, make/model, model year, engine horsepower, and the type of emission control technology installed.
- F. The Siting Board directs the Company to demolish all existing structures on the parcel not intended for reuse and to complete the MCP process for the entire 65-acre parcel with the exception of the National Grid substation. Furthermore, the Siting Board directs the Company to complete all demolition work and file a Response Action Outcome Statement or remedy operation status submittal under the MCP process by December 2016.
- G. The Siting Board directs the Company, prior to the commencement of construction, to provide to the Siting Board a recycling and reuse plan, with targets for demolition and construction waste and its anticipated recycling rate for operational wastes, and to explain how these targets are consistent with the goals of the Massachusetts 2010-2020 Solid

Waste Master Plan produced by MassDEP. The Siting Board further directs the Company to submit a report on the actual demolition and construction waste reuse and recycling rates before operation of the facility and to submit a report on operational recycling rates for the first year of operation of the facility.

- H. The Siting Board directs the Company to submit for approval: (1) final landscaping, lighting and design plans; (2) a description of the community process that took place prior to the completion of the final plans; and (3) a description of any changes to the plans from those in the record.
- I. The Siting Board directs the Company to provide, as requested by individual property owners or appropriate municipal officials, reasonable off-site mitigation of visual impacts, including shrubs, trees, window awnings, or other measures that would screen views of the proposed generating facility and related facilities at affected residential properties and roadways up to a one-half mile from the 20-acre site boundary where the facility impacts views. In implementing this requirement, the Company: (1) shall provide shrub and tree plantings, window awnings, or other reasonable mitigation on private property, only with the permission of the property owner, and along public ways, only with the permission of the appropriate municipal officials; (2) shall provide written notice of this requirement to appropriate officials and to all owners of property within one-half mile of the 20-acre site boundary, prior to the commencement of construction; (3) may limit requests for mitigation measures to a specified period ending no less than six months after initial operation of the facility; (4) shall complete all agreed-upon mitigation measures within one year after completion of construction, or if based on a request filed after commencement of construction, within one year after such request; and (5) shall provide a warranty to property owners to ensure that all plantings are established and replaced if needed at the end of one year from the date of planting, provided that the property owner reasonably maintains the plantings.
- J. The Siting Board directs Footprint to maintain and enhance Beattie Park.
- K. The Siting Board directs the Company to maintain the good appearance of the facility, including the stack and on-site landscaping, for the life of the project.
- L. The Siting Board directs the Company to consult with the City of Salem and MassDEP to develop an operational noise monitoring protocol, which shall consist of an ongoing periodic noise monitoring program and reporting procedure. The protocol shall include the collection of additional baseline noise measurements, taken on a schedule chosen in consultation with MassDEP and the City, and the periodic noise monitoring program should begin within six months of the commencement of the facility's commercial operation. The reporting procedure should provide for dissemination of monitoring results to the City and the community areas that are affected by noise increases from the facility of three dBA or more. The Company shall submit a copy of the noise monitoring protocol to the Siting Board prior to commercial operation. In the process of developing this protocol the Company should provide to other intervenors in this proceeding an opportunity to comment on the proposed protocol.

- M. The Siting Board directs the Company to confine noisy construction activities to weekdays only, with the exception of work that necessarily has a longer required continuous duration than normal construction hours allow, such as a concrete pour. Specifically, the Company may engage in any construction activities Monday through Friday, not earlier than 7:00 a.m. and not later than 5:00 p.m.<sup>86</sup> Non-noisy construction outside of these hours is to be requested from and scheduled through the City, and monitored by the City to ensure that such work is not disruptive to the community. Should the Company and the City not agree on such requests, the Company may make a request directly to the Siting Board, and notify the City in writing that it has done so. It shall be the Company's responsibility to demonstrate that it meets these requirements.
- N. The Siting Board directs Footprint to provide a compliance filing that includes a quantifiable explanation of what nighttime construction sound levels the City would regard as "noisy" and, therefore, would be prohibited by the Planned Unit Development Special Permit in the surrounding neighborhood.
- O. The Siting Board directs the Company to develop and adopt a clear and strict policy for its workers and contractors to minimize vehicular noise and visual impacts to surrounding neighborhoods in the event of second or third shift construction. The policy should include designated speed limits, staggered times of arrivals and departures, proper maintenance of vehicles, avoiding use of high beams and loud sound systems, and carpooling incentives, as well as additional mitigation measures that may be useful. Further, to encourage minimally disruptive worker arrivals and departures at the site, the Siting Board directs the Company to provide a police detail between the second and third shifts when the total number of workers entering and exiting the site exceeds 100 workers at the shift change.
- P. The Siting Board directs the Company, in consultation with the City, to develop an outreach plan for project construction and further development of the parcel, to be made available to the public by December 31, 2013. This outreach plan should, at a minimum, set forth procedures for providing prior notification to affected residents of: (1) the scheduled start, duration, and hours of construction; (2) any construction the Company intends to conduct that, must take place outside of the hours detailed above; and (3) complaint and response procedures including contact information, the availability of web-based project information, a dedicated project hotline for complaints, and protocols for notifying schools of upcoming construction. Furthermore, any noise complaints and the Company response thereto, arising from construction and/or worker traffic that occurs

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<sup>86</sup> The City of Salem's Noise Ordinance and the PUD Special Permit differs from this condition in that construction is allowed on Saturdays (except for blasting, rock crushing, pile driving or jackhammering). The Siting Board expressly limits any additional Saturday work hours allowed by the City of Salem under the PUD Special Permit to "non-noisy" activities, as defined in the PUD Special Permit and the Board's 48 dBA limit, described supra.

outside of the hours of Monday through Friday from 7:00 a.m. to 5:00 p.m., shall be reported to the Siting Board within one week of the Company's receipt of the complaint.

- Q. The Siting Board directs the Company to install, prior to construction and demolition, and no later than June 2014, a twelve-foot high temporary sound wall at the western boundary of the site along Derby Street.
- R. The Siting Board directs the Company to develop an Emergency Response Plan for the proposed facility in consultation with both the City and representatives of the HDSNA/PNA and to provide a report to the Board on the outcome of the consultations before the start of commercial operation of the facility. Such report should include a public version of the plan, as well as recommendations and comments resulting from the consultations. The City and the HDSNA/PNA may each submit a separate report to the Board, if they so desire. Based on the report(s), the Siting Board will confirm that the Company's safety and security plans establish that the safety impacts of the facility would be minimized.
- S. The Siting Board directs Footprint to file with the Board, by January 1, 2014, a plan that has been approved by the City, describing how the Company will enable the City to accomplish its required inspectional tasks for the project.
- T. The Siting Board directs Footprint: (1) to contact the City, representatives of the Bentley School, National Grid, and Algonquin and solicit their cooperation and participation in preparing an initial plan putting into effect a roadway and traffic mitigation system for Salem; (2) to prepare such a plan with as many parties are agreeable to participate; (3) to submit the plan to the Siting Board and all parties by January 1, 2014; and (4) to implement the plan. The roadway and traffic mitigation system shall include the following elements: (a) a single repository of information relevant to construction scheduling, road openings, and traffic flow; (b) the provision of a traffic control officer at the Derby Street and Webb Street intersection at shift changes when there are 250 or more workers on site; (c) a plan to operate a traffic-monitoring device at the intersection of Bridge Street and Webb Street, and at any other appropriate road intersection(s), on dates when roadwork for any project or an increase in the size of the Footprint workforce might create adverse traffic flow impacts; (d) a menu of potential mitigation options, and a decision tree or other suitable approach determining their implementation; (e) a platform for Footprint, National Grid, Algonquin, and the Salem DPW to coordinate construction activities; and (f) a protocol for allocation of mitigation costs. In addition, the Siting Board directs Footprint to provide it with quarterly reports on its traffic monitoring, coordination with other entities, and traffic mitigation activities, from the date of this Decision to the completion of construction.
- U. The Siting Board directs the Company to enter into a CBA, and to file with the Board for review any executed CBA(s).

- V. The Siting Board directs Footprint to continue coordinating with the City and other stakeholders to develop plans for the remaining 45 acres of the site, including public access as appropriate, and to submit all Notice of Project Change filings under MEPA to the Siting Board.
- W. The Siting Board directs the Company to work with the City and other stakeholders to develop plans for maintenance, security, and overall conditions for the remaining 45 acres until those acres are developed, and to file those plans with the Siting Board for approval, and with the City, three months prior to commercial operation of the facility.

Because issues addressed in this Decision relative to this facility are subject to change over time, construction of the 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. Project proponents have an absolute obligation to construct and operate the project in conformance with all aspects of the proposal as presented to the Siting Board. Therefore, the Siting Board requires Footprint and/or its successors in interest, to notify the Siting Board of any changes other than minor variations to the proposal so that the Siting Board may decide whether to inquire further into a particular issue. Footprint 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.



Robert J. Shea  
Presiding Officer

Dated this 10<sup>th</sup> day of October, 2013

# Mark Sylvania (Acting Energy Facilities Siting

Exec

APPROVED by the Energy Facilities Siting Board at its meeting of October 10, 2013, by the members present and voting. Voting for approval of the Tentative Decision as amended:

Publi

Mark Sylvania (Acting Energy Facilities Siting Board Chair for Richard Sullivan, Secretary, Executive Office of Energy and Environmental Affairs); Ann G. Berwick, Chair, Department of Public Utilities; Jolette A. Westbrook, Commissioner, Department of Public Utilities; Laurel

Macl

Mackay (Designee for Commissioner, Department of Environmental Protection); Victoria Maguire (Designee for Secretary, Executive Office of Housing and Economic Development); and Kevin Galligan, Public Member. Abstaining: Penn Loh, Public Member.

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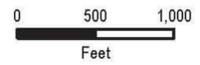
  
Mark Sylvania, Acting Chair  
Energy Facilities Siting Board

Dated this 10<sup>th</sup> day of October, 2013

Dated this 10<sup>th</sup> day of October, 2013

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

Attachment 1.



Base Map:MaGIS  
2008 Aerial

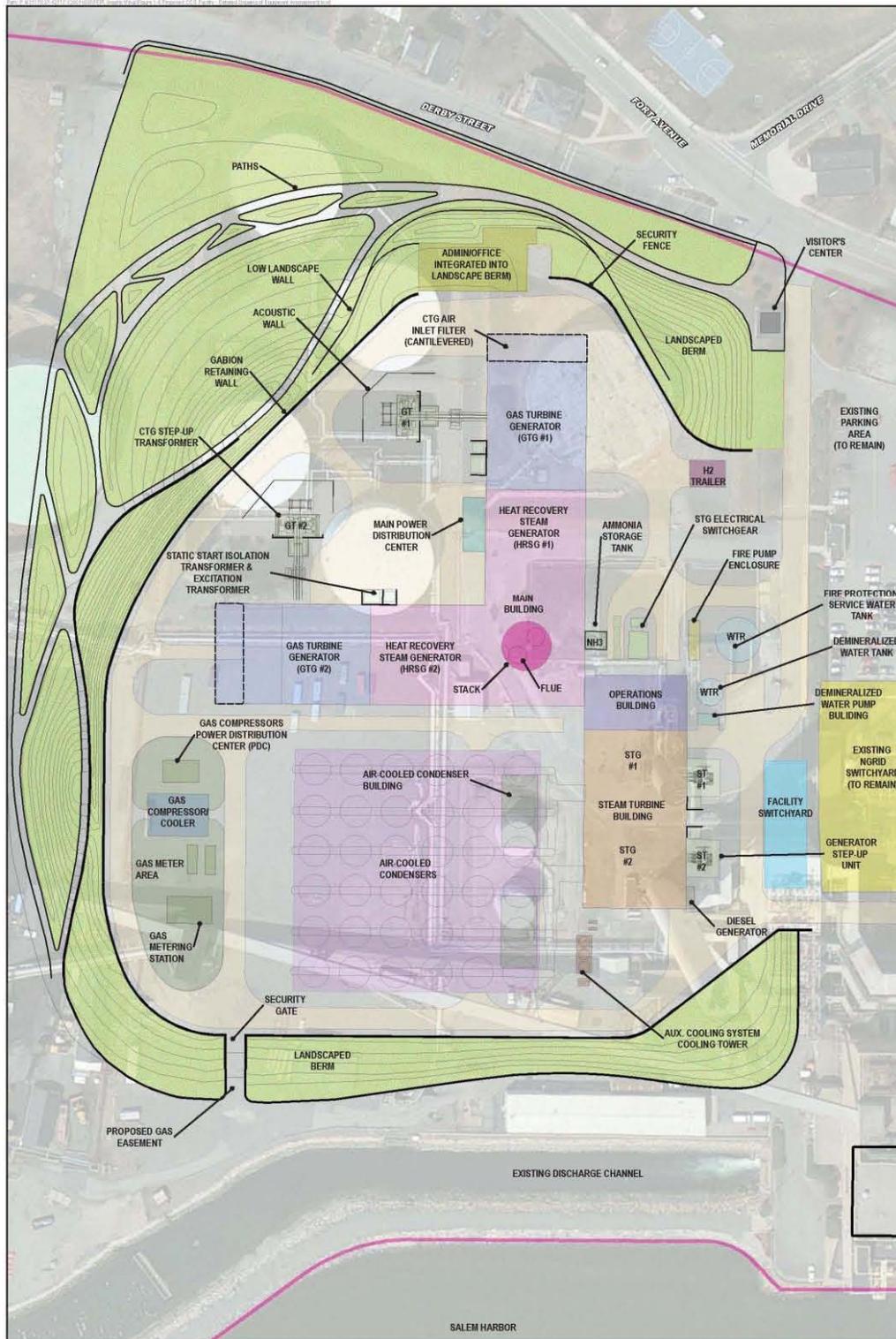
Salem Harbor Station Redevelopment Project  
Salem, Massachusetts

Aerial Photograph of Site  
(Overview)

Figure 1-2



Attachment 3.



SALEM HARBOR




0 50 100  
Feet

Base Map: Bing  
2010 Aerial

Salem Harbor Station Redevelopment Project  
Salem, Massachusetts

Proposed CCG Facility  
Detailed Drawing of  
Equipment Arrangement

Figure 1-5

**COMMONWEALTH OF MASSACHUSETTS  
ENERGY FACILITIES SITING BOARD**

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In the Matter of the Initial Petition and )  
Application of Footprint Power Salem Harbor ) EFSB 13-1  
Development LP for a Certificate of )  
Environmental Impact and Public Interest )  
)

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FINAL DECISION

M. Kathryn Sedor  
Presiding Officer

February 25, 2014

On the Decision:  
Barbara Shapiro

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FOR: National Grid USA Service Company, Inc.,  
d/b/a National Grid  
Limited Participant



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The Massachusetts Energy Facilities Siting Board (“Siting Board” or “Board”) hereby GRANTS: (1) the Initial Petition; and (2) the Application of Footprint Power Salem Harbor Development LP (“Footprint” or “Company”) for a Certificate of Environmental Impact and Public Interest (“Certificate”) for the construction of a 630 megawatt (“MW”) natural gas-fired, quick-start, combined-cycle electric generating facility at the present location of the Salem Harbor Station in Salem, Massachusetts.

## I. INTRODUCTION

Pursuant to G.L. c. 164, §§ 69K½ - 69O½ (“Certificate statute”), Footprint filed with the Siting Board an Initial Petition and Application for a Certificate to construct a 630 MW natural gas-fired, quick-start, combined-cycle electric generating facility in the City of Salem (“project” or “facility”). Footprint indicated that the filing of the Initial Petition and Application was necessitated by the appeal (“Zoning Appeal”) by two Salem residents of a decision issued by the City of Salem Zoning Board of Appeals (“ZBA”) granting a Special Permit for an Essential Service Use pursuant to Section 3.0 of the City of Salem’s Zoning Ordinance Use Regulations, and Variances from the City’s Dimensional Requirements pursuant to Section 4.0 of the Zoning Ordinance. The Certificate, appended to this Decision as Exhibit A, has the effect of granting seven final state and local permits for the project.

### A. Summary of the Proceeding

#### 1. Project Description

Footprint proposes to construct a generating facility consisting of two quick-start natural gas turbine generators, two heat recovery steam generators, two steam turbine generators, and a block of air-cooled condensers (Exh. FP-1, at 4-5). The facility would be capable of generating 630 MW without duct firing; with duct firing under summer conditions, it would produce an additional 62 MW, for a total of 692 MW (*id.* at 4). The facility would be constructed on a 65-acre parcel that is presently occupied by four separate electric generating units (*id.* at 6). Two of the four units have ceased operation; the remaining two units are scheduled to cease operation on June 1, 2014 (Exh. FP-2, at 15). Demolition of the existing units would begin in early 2014; construction of the proposed facility would begin in June 2014, with completion by the end of May 2016 (Exh. FP-1, at 1). The facility is scheduled to commence commercial operation in June 2016.

The Siting Board approved the project on October 10, 2013. Footprint Power Salem Harbor Development LP, EFSB 12-2 (October 10, 2013) (“Footprint 12-2 Decision”).

2. Relief Requested

On June 28, 2013, the ZBA issued a decision approving Footprint’s petition for a Special Permit for an Essential Service Use pursuant to Section 3.0 of the City of Salem’s Zoning Ordinance Use Regulations, as well as Variances from the City’s Dimensional Requirements pursuant to Section 4.0 of the Zoning Ordinance (“Salem ZBA Approval”) (Exh. FP-1, at 2). On July 17, 2013, two residents of Salem, Michael Furlong and William Dearstyne, appealed the Salem ZBA Approval (*id.*).<sup>1</sup> Footprint subsequently filed with the Siting Board an Initial Petition followed by an Application, pursuant to the Certificate statute.<sup>2</sup>

In its Initial Petition and Application, Footprint originally asked the Siting Board to grant a Certificate containing the equivalent of the Salem ZBA Approval and twelve additional state and local permits identified by the Company as necessary for project construction (Exh. FP-2, at 26, 27).<sup>3</sup> Since the filing of the Initial Petition and Application, the Company has withdrawn its request for four of those 13 permits because these have subsequently been granted and the appeal periods have expired (Exhs. EFSB-FP-1; EFSB-FP-5; EFSB-FP-6; Company Brief at 45).<sup>4</sup> A fifth

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<sup>1</sup> Mr. Furlong and Mr. Dearstyne also subsequently appealed the decision issued by the Salem Planning Board on August 27, 2013, granting additional zoning approvals for the project.

<sup>2</sup> Both the Company’s Initial Petition and its Application are under review in this proceeding. See Sections II and III, below.

<sup>3</sup> Footprint in its Application designated two Massachusetts Department of Environmental Protection air permits as one permit. The Siting Board views them as two separate permits and discusses them below (See Section III.B.3). Thus, while Footprint attached to its Application a list of twelve permits, we review in this Decision the Company’s requests for 13 permits.

<sup>4</sup> These four permits are: a MassDEP Industrial Sewer Use Permit; a Massachusetts Department of Transportation consent to build on lands formerly used as a railroad right-of-way; a City of Salem Approval to connect to the Salem water system; and a City of Salem Approval to connect to the Salem public sewer and discharge industrial wastewater.

permit was similarly granted and is now past the date of any potential appeal.<sup>5</sup> Accordingly, the Siting Board in this proceeding reviews the Company's request for a Certificate incorporating each of the following eight permits:

1. A Special Permit for an Essential Service Use pursuant to Section 3.0 of the City of Salem's Zoning Ordinance Use Regulations, ordinarily issued by the Salem Zoning Board of Appeals; and Variances from the City's Dimensional Requirements pursuant to Section 4.0 of the Zoning Ordinance, ordinarily issued by the Salem Zoning Board of Appeals;
2. Site Plan Approval; a Planned Unit Development ("PUD") Special Permit; and a Special Permit for a Flood Hazard Overlay District, pursuant to G.L. c. 40A, and Sections 7.3, 8.1, and 9.5, respectively, of the Salem Zoning Ordinance. These permits are ordinarily issued by the Salem Planning Board;
3. A Phase II Demolition Permit, pursuant to Chapter 12 of the Salem Code of Ordinances, ordinarily issued by the Salem Inspectional Services Department;
4. A Building Permit for new construction, pursuant to Chapter 12 of the Salem Code of Ordinances, ordinarily issued by the Salem Inspectional Services Department;
5. A Chapter 91 Variance and License, pursuant to G.L. c. 91 and 310 CMR 9.00, ordinarily issued by the Massachusetts Department of Environmental Protection ("MassDEP");
6. A Comprehensive Plan Application ("CPA") Approval, pursuant to G.L. c. 111 §142A – 142N and 310 CMR 7.00, an air permit ordinarily issued by MassDEP;
7. A Prevention of Significant Deterioration ("PSD") Permit, pursuant to the federal Clean Air Act and 40 CFR 52.21, an air permit ordinarily issued by MassDEP; and
8. A State Fire Marshal Above Ground Storage Tank Construction Permit and Use Permit, pursuant to G.L. c. 148, § 37, ordinarily issued by the Massachusetts Department of Public Safety, Office of the State Fire Marshal.<sup>6</sup>

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<sup>5</sup> The fifth permit is a Wastewater Discharge Permit pursuant to Chapter 46 of the Salem Code of Ordinances, ordinarily issued by the South Essex Sewerage District ("SESD"). The SESD issued a final Wastewater Discharge Permit on December 6, 2013 (Exh. SESD-1). The SESD stated that this permit cannot be appealed by a party other than the petitioner (RR-SESD-4). Further, the 30-day appeal period has expired (*id.*). Therefore, the Siting Board does not include the SESD Wastewater Discharge Permit in the Certificate issued in this proceeding.

<sup>6</sup> As discussed in Section III.B.4, below, the State Fire Marshal ordinarily issues the construction permit and use permit separately. In this Decision, we address and issue these together as a single permit.

### B. Jurisdiction

Footprint filed its Initial Petition and Application for a Certificate under G.L. c. 164, §§ 69K½ - 69O½. Pursuant to these provisions of the Certificate Statute, any applicant that proposes to construct or operate a generating facility in Massachusetts may seek a Certificate from the Siting Board if the applicant is prevented or delayed from building the facility because of an adverse state or local agency permitting decision, undue agency delay, or the appeal by a third party of a state or local agency permitting decision. The Certificate, if granted, has the legal effect of granting the permit in question, and may grant additional project permits as well. The Siting Board makes a decision on a Certificate Application for a generating facility in accordance with: (1) G.L. c. 164, § 69L½ (which requires that an Application contain certain information and representations); (2) G.L. c. 164, § 69O½ (which requires the Siting Board to include three specific findings and opinions in its decision); and (3) G.L. c. 164, § 69H (which requires the Siting Board to implement the energy policies in its statute to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost).

### C. Procedural History

This proceeding commenced with the filing by Footprint of an Initial Petition for a Certificate with the Siting Board on August 5, 2013, pursuant to G.L. c. 164, §69K½ (Exh. FP-1). On August 8, 2013 and pursuant to 980 CMR 6.02(4), the Acting Chair of the Siting Board deferred the Board's decision on the Initial Petition until after the Company filed an Application for a Certificate and to consider the merits of the Initial Petition concurrently with the hearing on the Application. The Acting Chair also determined that Footprint could not file its Application unless and until the Siting Board approved the Company's petition to construct the generating facility pursuant to G.L. c. 164, §69J¼ (Determination on Review of Initial Petition and Filing of Application (August 8, 2013)). As mentioned above, the Siting Board approved the petition to construct on October 10, 2013. The Company then filed its Application for a Certificate on October 11, 2013, pursuant to G.L. c. 164, §69L½ (Exh. FP-2). The Initial Petition and Application were consolidated for review, consistent with Siting Board practice.

The Presiding Officer granted intervention status to the City of Salem (“City”), MassDEP, the Conservation Law Foundation (“CLF”), and Salem residents William Dearstyne and Michael Furlong, and limited participant status to National Grid USA Service Company, Inc.

Beginning in October 2013, and continuing through December 2013, the Siting Board and CLF conducted written discovery. On December 3, 2013, the Company submitted the prefiled direct testimony of two witnesses: Scott Silverstein, Footprint’s President and Chief Operating Officer; and Peter Furniss, Footprint’s Chief Executive Officer. On December 5, 2013, MassDEP submitted the prefiled direct testimony of Ben Lynch, Section Chief of the MassDEP Waterways Program. MassDEP also sponsored two witnesses from the MassDEP Northeast Region Bureau of Waste Protection: James Belsky, Permit Chief; and Edward Braczyk, Permit and Compliance Environmental Engineer. The City sponsored one witness: Michael Lutrzykowski, Assistant Building Inspector. The exhibits entered into the record include: (1) responses by the Company and the relevant permitting agencies to information requests and record requests issued in this proceeding by the Siting Board and the parties; and (2) all exhibits entered into the record in EFSB 12-2, the adjudicatory proceeding in which the Siting Board originally approved the project (“underlying proceeding”). Evidentiary hearings were conducted on December 10 and 11, 2013. On December 24, 2013, Footprint, MassDEP, the City, and CLF filed briefs and responses to specific briefing questions issued by the Siting Board.

On February 4, 2014 the Siting Board issued a Tentative Decision approving Footprint’s Initial Petition and Application and issuing a Certificate containing seven state and local permits. On February 18, 2014 CLF and Footprint filed a Settlement Agreement (“Settlement Agreement”) (Exh. FP/CLF-1; also, Exhibit A, Attachment 4, to this Decision). CLF and Footprint requested that the Siting Board include the Settlement Agreement without modification as a condition to the Certificate of Environmental Impact and Public Interest. On February 20, 2014 the Siting Board voted to adopt the Tentative Decision with amendments including the Settlement Agreement as a condition to the Final Decision.

#### D. Motion to Dismiss

On November 26, 2013, CLF filed a Motion to Dismiss Footprint’s Initial Petition and Application (“CLF Motion to Dismiss”) alleging that Footprint failed to: (1) demonstrate that it meets any of the statutory grounds on which an Initial Petition may be based, as set forth in

G.L. c. 164, § 69K½; (2) meet the requirement in G.L. c. 164, § 69L½ that a “good faith effort” be made by the applicant to obtain the permits the applicant seeks to include in the Certificate; and (3) provide sufficient evidence to allow the Siting Board to make findings regarding Footprint’s compliance with the Massachusetts Global Warming Solutions Act (“GWSA”) (CLF Motion to Dismiss at 1-2). In the alternative, CLF requested clarification of the scope of the proceeding with respect to: (1) whether the scope extends to a determination by the Siting Board of the facility’s consistency with the GWSA; and (2) whether the scope of the proceeding is limited to permits “that are not preempted by federal law,” *i.e.*, whether the Siting Board can include the two MassDEP air permits for the facility, which CLF asserted are federal permits that the Siting Board is preempted from including in a Certificate (*id.*). On December 3, 2013, Footprint filed an opposition to the CLF Motion to Dismiss (“Footprint Opposition to Motion to Dismiss”).

The Presiding Officer issued a ruling on December 9, 2013, denying the CLF Motion to Dismiss (“Ruling on CLF Motion to Dismiss”) on the basis that none of CLF’s assertions supported a motion to dismiss; rather, that resolution of the issues raised by CLF would be appropriate only after development of the record and legal argument by the parties in their briefing had been completed. With respect to the GWSA, the ruling stated that the issue of GWSA compliance had been litigated in the EFSB 12-2 proceeding and would not be relitigated in this proceeding. With respect to the two MassDEP air permits, the ruling stated that the propriety of including these permits in the Certificate would be determined after development of the record and legal arguments on the issue had been completed (Ruling on CLF Motion to Dismiss at 2). On December 16, 2013, CLF moved for reconsideration of the Ruling on the Motion to Dismiss, which the Siting Board denied in a ruling on January 8, 2014.

In addition to the rulings issued on December 9, 2013 and January 8, 2014, this Decision further addresses the grounds asserted by CLF for its motion to dismiss and motion for reconsideration. Analysis of the Initial Petition and Application, and its compliance with statutory requirements, is addressed in Section II.B, below; whether Footprint has met the statutory “good faith effort” requirement is discussed in Section III.C.4, below; Footprint’s compliance with the GWSA in this proceeding is discussed in Section III.B.1 and 4, below; and finally the issue of whether the Siting Board is preempted from including the two MassDEP air permits in the Certificate is addressed in Section III.C.3, below.

## II. INITIAL PETITION

### A. Standard of Review

To initiate a Certificate proceeding, an applicant must file an Initial Petition.

G.L. c. 164, § 69K½; 980 CMR 6.02. For generating facilities, the Certificate statute provides that the Siting Board shall grant an Initial Petition if: (1) the applicant asserts at least one of the seven grounds for a Petition set forth in G.L. c. 164 § 69K½; and (2) the Siting Board determines that, on the merits, at least one of the asserted grounds constitutes a valid basis for granting the Initial Petition. Id.

### B. Analysis and Findings

#### 1. Delay Caused by Appeal

Footprint's Initial Petition is based solely on G.L. c. 164, § 69K½ (vi). This provision of the Certificate statute provides that the Siting Board shall grant an Initial Petition if it finds that "the facility cannot be constructed because of delays caused by the appeal of any approval, consent, permit, or certificate." Footprint asserts that the Zoning Appeal prevents timely construction of the facility.

As noted above, the Zoning Appeal was filed in Essex Superior Court on July 13, 2013 (Exhs. FP-1, at 12; FP-2, at 14).<sup>7</sup> Footprint noted that the Superior Court estimated that it would require approximately 22 months to issue a decision on the Zoning Appeal (Exhs. FP-1, at 12, and at 29 n.16). Footprint noted that, once issued, a decision on the Zoning Appeal may be further appealed, thus resulting in additional significant delay in the commencement of project construction (id. at 12).

Footprint stated that ISO New England ("ISO-NE") has found a need for additional capacity in the electric power supply region of northeastern Massachusetts (known as NEMA/Boston) beginning in June 2016; to meet this need, Footprint is under contractual

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<sup>7</sup> The Company indicated that the Zoning Appeal has since been removed to the Land Court (Company Brief at 16 n.8). CLF stated that the Zoning Appeal and the appeal of the Salem Planning Board Approval have been consolidated and both removed to Land Court (CLF Brief at 9 n.6). CLF alleged that the appeals are "likely to move along more quickly" in Land Court (id. at 11), but there is no record evidence to support this assertion.

obligation to ISO-NE to begin operation of the proposed facility by June 2016 (Exh. FP-2, at 50-51; Footprint Opposition to Motion to Dismiss). Footprint stated that if the Company fails to meet the June 2016 in-service date, potential consequences include: (1) a 300 MW capacity shortfall in NEMA/Boston in June 2016, as currently estimated by ISO-NE; and (2) significant financial losses for the Company under the ISO-NE tariff (Footprint Opposition to Motion to Dismiss at 6-7). To meet the June 2016 in-service date for the project, Footprint has calculated that it must obtain project financing by February 2014 and begin project construction by June 2014 (Exh. FP-1, at 13; Tr. 2, at 170-177; Company Brief at 24). Footprint stated that delay due to the Zoning Appeal will prevent the Company from achieving this timetable (Company Brief at 24).

Footprint stated that the existence of the Zoning Appeal precludes the Company from commencing facility construction as a matter of law. Footprint stated that, in accordance with state law, the variances that the Salem ZBA granted for the facility cannot become effective until the Zoning Appeal has been denied or dismissed (Exh. FP-1, at 12; Company Brief at 23). Additionally, Footprint stated that construction of the facility cannot begin until the City issues a building permit (Exh. FP-2, at 29-30). The City stated that its Inspectional Services Department cannot issue a building permit that requires a variance, unless the variance has been granted and is not under appeal (RR-EFSB-COS-2; City Brief at 4; Company Brief at 23).

Mr. Furniss testified that, based on his experience in financing of electric generation facilities in Massachusetts and the region, banks will not provide financing for a project where permits “that go to the heart of the project” are under appeal or even under the threat of an appeal (Tr. 2, at 172, 178-179). He added that construction could not commence without such financing (id.).

CLF asserts that while the Zoning Appeal may delay the project to some extent, Footprint has failed to demonstrate that: (1) the delay would preclude project construction as defined by G.L. c. 164, § 69K½ (vi); or (2) the delay would be so significant as to preclude commencement of construction by June 2014 (CLF Brief at 9-11). CLF also asserts that Footprint has not demonstrated that, but for the Appeal, project construction could proceed, since other project permits beyond the scope of this proceeding have potentially longer appeal periods (id. at 11).

Regardless of whether the matter is pending in Superior Court or Land Court, the precise timing of the issuance of a decision on the Zoning Appeal cannot be ascertained. However, the record in this case is sufficient to establish that the pendency of the Zoning Appeal will preclude

project construction at least until a decision on the Appeal has been issued. Further, because the parties to the court proceeding would have the opportunity to appeal the decision, project construction may be further, and significantly, delayed.

The Siting Board has previously addressed the question of what an applicant must assert to demonstrate that a facility “cannot be constructed” due to delays caused by the appeal of a project permit within the meaning of G.L. c. 164, § 69K½ (vi). Indeed, the Board determined that G.L. c. 164, § 69K½ (vi) was satisfied in similar circumstances when an appeal of zoning permits to the Land Court caused a delay in commencing construction of a generating facility. IDC Bellingham LLC, 13 DOMSB 1, at 11-17 (2001) (“IDC Bellingham”). In IDC Bellingham, the appeal likewise precluded obtaining a building permit needed to begin construction, and prevented other steps required for construction. Although the Siting Board concluded that it could not determine when the Land Court would decide the appeal, the Board noted that the appeal had been pending for nine months and had not yet been decided. Id. at 16. The Board also noted that further delay was possible because parties to the Land Court proceeding could appeal the Land Court decision. Id. Furthermore, the Siting Board specifically rejected two of the arguments asserted by CLF here. The Board determined that an applicant is not required to show that: (1) the facility could never be constructed because of the delay caused by an appeal; or (2) but for the appeal, the facility could be constructed. Id. at 15-16.

Based on the Siting Board’s analysis in IDC Bellingham and the record in this proceeding, the Siting Board finds that the pendency of the Zoning Appeal could prevent the Company from completing project construction in time to meet its required June 2016 in-service date. This showing is sufficient to demonstrate that the facility cannot be built due to delay caused by the Appeal, within the meaning of G.L. c. 164, § 69K½ (vi).

### C. Decision on the Initial Petition

As noted in Section II.B, above, the Company asserted in its Initial Petition one of the seven grounds on which the Siting Board’s grant of an Initial Petition may be based. The Siting Board has found that Footprint has raised a substantively valid basis for granting the Company’s Initial Petition. Accordingly, the Siting Board GRANTS the Company’s Initial Petition.

### III. THE APPLICATION

#### A. Standard of Review

Pursuant to G.L. c. 164, § 69O½, if the Siting Board issues a Certificate for a generating facility, the Certificate must include the Siting Board's findings and opinions with respect to the following: (1) the compatibility of the facility with considerations of environmental protection, public health, and public safety; (2) the extent to which construction and operation of the facility will fail to conform with existing state or local laws, ordinances, by-laws, rules and regulations and the reasonableness of exemption thereunder, if any, consistent with the implementation of the energy policies contained in this chapter; and (3) the public interest or convenience requiring construction and operation of the generating facility. G.L. c. 164, § 69O½. See Berkshire Power Development, Inc., 8 DOMSB 1, at 291 (1999) ("Berkshire Power"); IDC Bellingham at 20 (2001).

The Siting Board bases its findings and opinions on both the record developed in the Certificate proceeding and the record developed in the underlying Siting Board proceeding in which the Board reviewed and approved the proposed facility. See Cape Wind Associates, LLC, EFSB 07-8 (2009) ("Cape Wind"); see also G.L. c. 164, § 69O, 69O½. The Siting Board does not relitigate in a Certificate proceeding issues already fully and fairly determined in the underlying proceeding. Berkshire Power at 296-297. However, in order to provide a full review of a previously approved facility, the Board: (1) reviews the decision from the underlying Siting Board proceeding; and (2) determines the extent to which new information has been developed or the circumstances of a project may have changed in the intervening period. See, e.g., Cape Wind at 9-10.<sup>8</sup>

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<sup>8</sup> Additionally, in Certificate cases where the applicant is challenging an adverse agency permitting decision, the Siting Board verifies that the issues raised by the agency have been addressed in a comprehensive manner by the Board, either in its review of the facility under G.L. c. 164, § 69J¼ and/or in its review under G.L. c.164, § 69K½. G.L. c. 164, §§ 69O, 69O½; Cape Wind at 9-10. Such an inquiry is not relevant here, as the Company's Initial Petition and Application are based on the appeal by third parties of an agency decision favorable to the Company; the Company does not seek to overturn or modify an adverse agency decision.

B. Opinions and Findings

The three specific findings the Siting Board must make to support the issuance of a Certificate of Environmental Impact and Public Interest for a facility are discussed below.

1. Compatibility With Environmental Protection, Public Health and Safety

Pursuant to G. L. c. 164, § 69O½, the Siting Board must make a finding with respect to the compatibility of the facility with considerations of environmental protection, public health, and public safety.

a. Prior Siting Board Review

As indicated above, the Siting Board conducted a full adjudicatory proceeding on the Company's petition to construct the facility, and issued a Final Decision approving the project in October 2013. In the underlying proceeding, the Siting Board conducted a comprehensive review of the environmental impacts of the proposed facility. See Footprint 12-2 Decision at Sections IV.B through IV.K. The Siting Board found that with conditions relating to air, hazardous and solid waste, visual, noise, safety, traffic, and land use impacts, Footprint's plans for the construction of the proposed facility would minimize the environmental impacts of the facility consistent with the minimization of costs associated with the mitigation, control, and reduction of the facility's environmental impacts. Footprint 12-2 Decision at 101, 106. The Siting Board also found that the plans for the construction of the proposed generating facility are consistent with current health and environmental protection policies of the Commonwealth, and with such energy policies of the Commonwealth as have been adopted by the Commonwealth for the specific purpose of guiding the decisions of the Siting Board. Id. at 105. The Siting Board found that, with the required mitigation, the construction and operation of the proposed generating facility is consistent with the GWSA. Id. at 32, 104.

b. CLF

CLF asserts that the Siting Board must consider the greenhouse gas ("GHG") emissions of the facility in the context of the current Certificate proceeding (CLF Brief at 14). In order to comply with the GWSA, CLF asserts that the Board must also review the Footprint 12-2 Decision and determine the extent to which new information has been developed or whether the

circumstances of a project may have changed in the intervening period (id.). CLF points to record evidence provided by Footprint regarding new carbon dioxide (“CO<sub>2</sub>”) emission rates from the facility with and without duct firing (id.). Specifically, CLF asserts that the Siting Board relied on a different CO<sub>2</sub> emissions rate in the Footprint 12-2 Decision than the rate presented in this proceeding, and that no new modeling was conducted using the new rate (id. at 15).<sup>9</sup>

c. Settlement Agreement

As mentioned above, Footprint and CLF requested that the Siting Board issue a Certificate that includes the Settlement Agreement as a condition. The main substantive component of the Settlement Agreement is titled “Additional Measures Regarding Greenhouse Gases” (Settlement Agreement at 4). In that provision of the agreement, Footprint agrees to a GHG cap for the first ten years of the facility’s operation (through 2025) that is identical to the annual and uniform GHG emission limit allowed in the MassDEP CPA Approval (id.). Beginning in 2026, Footprint agrees to annually decreasing GHG caps continuing through 2049. Footprint also agrees to cease operation of the facility no later than January 1, 2050, and to fully decommission the facility within two calendar years of its shutdown (id. at 6).

CLF agrees not to file or support any appeal of the Final Decision in this Certificate proceeding, and to voluntarily dismiss its pending appeal of the Footprint 12-2 Decision. CLF also agrees not to file any appeals or other challenges of the CPA Approval and PSD Permit issued for the facility, and to voluntarily dismiss a civil lawsuit it filed challenging the authority of MassDEP to issue PSD permits (Settlement Agreement at 7-8).<sup>10</sup>

d. Analysis

As noted above, the Siting Board does not relitigate in a Certificate proceeding issues that have been fully and fairly decided in the underlying proceeding. This practice reflects considerations of both fairness and administrative efficiency. See Berkshire Power at 296-297. Here, in the underlying proceeding, the Board conducted a comprehensive review of the facility’s potential environmental impacts, including its consistency with the GWSA. Thus, the Siting

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<sup>9</sup> CLF made these arguments prior to the submission of the Settlement Agreement.

<sup>10</sup> This description does not include all of the provisions of the Settlement Agreement. The entire agreement is attached to this Decision (Exhibit A, Attachment 4).

Board will not conduct a de novo environmental review, including GWSA review, in this proceeding.

The Siting Board does compare the record evidence and the decision in the underlying Siting Board proceeding with the information provided in a Certificate proceeding, to determine whether new information has been developed or the circumstances of a project have changed in the intervening period. The Siting Board notes, and the Company confirmed, that no new or updated relevant evidence regarding the proposed project has been presented in this proceeding (Company Brief at 8 n.4). With respect to CLF's assertion that new CO<sub>2</sub> emission rates have been introduced in this proceeding, we note that the CO<sub>2</sub> emission rates referred to by CLF as "new" actually were provided by Footprint in the underlying proceeding and are included in the record of that proceeding. See Footprint 12-2 Decision at 23.

In the underlying proceeding, the Company initially presented a CO<sub>2</sub> emission rate of 842 lbs/MWh. Footprint 12-2 Decision at 23. In making the finding in the underlying proceeding that the proposed generating facility is consistent with the GWSA, the Siting Board focused on this 842 lbs/MWh CO<sub>2</sub> emission rate. Later in the underlying proceeding, the Company updated the record by noting that it had selected the General Electric F Class turbine, which has a CO<sub>2</sub> emission rate of 825 lbs/MWh. Footprint 12-2 Decision at 23 n.23. In comments on the Tentative Decision in the underlying case, the Company clarified that the 825 lbs/MWh emission rate figure does not reflect operation of the facility with supplementary duct firing, and that the facility would emit 895 lbs/MWh of CO<sub>2</sub> with duct firing. Id. To address this additional information in the underlying case, the Siting Board directed Footprint to submit a compliance filing explaining the higher emissions rate associated with duct firing. Id.

In the instant proceeding, the Company explained that, assuming operations at 100 percent of capacity (8,760 hours per year) and the maximum duct firing (720 hours per year) allowed by the air permit, the annual average CO<sub>2</sub> emission rate for the facility would be 835 lbs/MWh (Tr. 1, at 98-102). This annual average CO<sub>2</sub> emission rate of 835 lbs/MWh is slightly lower than the 842 lbs/MWh emission rate used in the underlying proceeding to calculate emissions impacts. Likewise, the Settlement Agreement does not allow any increase from the maximum CO<sub>2</sub> levels contained in the MassDEP CPA Approval, and also includes a declining annual CO<sub>2</sub> emissions cap after 2025. Accordingly, regardless of whether the Board were to incorporate the Settlement Agreement as a condition to the decision, there is no basis for the Siting Board to reach a

conclusion that differs from the Footprint 12-2 Decision that the project is consistent with the GWSA.

We find in this case no new information or project changes requiring additional analysis beyond that which occurred in the underlying proceeding. Therefore, the conclusions and findings reached in the Footprint 12-2 Decision regarding environmental impacts, public health and safety remain valid and will be used for purposes of this decision. Accordingly, the Siting Board finds that construction and operation of the proposed generating facility is compatible with considerations of environmental protection, public health and public safety.

2. Conformance with Laws and Reasonableness of Exemption Thereunder

Pursuant to G. L. c. 164, § 69O½, the Siting Board must make a finding with respect to the extent to which construction and operation of the facility will fail to conform with existing state or local laws, ordinances, by-laws, rules and regulations and the reasonableness of exemption thereunder, if any, consistent with the implementation of the energy policies applicable to the Siting statute.

The Siting Board acknowledges that the granting of a Certificate in this proceeding will allow the Company to construct the project, notwithstanding the pending judicial appeals of the Salem ZBA Approval and the Salem Planning Board Approval, and the pending administrative appeal of the MassDEP Chapter 91 Written Determination for the project. See Section III.C.2, below. Issuance of the Certificate also precludes any appeals of the other state and local permits included in the Certificate. The Siting Board notes that this result was intended by the Legislature in enacting the Certificate statute, and is consistent with the statute. See House No. 6190, Third Report of the Massachusetts Electric Power Plant Siting Commission (March 30, 1974).

With the exception of the State Fire Marshal Permit, Footprint has applied for each permit it requests in its Application, and the relevant permitting agencies have issued either a draft or final permit.<sup>11</sup> Further, although the Certificate statute does not require it, the Board provided each of the permitting agencies with the opportunity to recommend appropriate permit conditions, and to indicate whether it opposed inclusion of its permit(s) in the Siting Board Certificate. Each of the permitting agencies provided the Board with proposed permit conditions, and stated that it did not

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<sup>11</sup> The State Fire Marshal Permit is discussed in Section III.C.4, below.

oppose inclusion of its permit or permits in the Certificate (Exhs. EFSB-COS-1; EFSB-SFM-1; EFSB-SFM-2; EFSB-DEP-GEN at 1-2; MassDEP Brief at 2-3; City Brief at 5). The record in this proceeding does not demonstrate any area of actual or potential non-conformance with local or state laws, ordinances, by-laws, rules or regulations.

### 3. Public Interest or Convenience

Pursuant to G. L. c. 164, § 69O½, the Siting Board must make a finding with respect to the public interest or convenience requiring construction and operation of the facility. After conducting an extensive review of the potential environmental impacts of the generating facility, the Siting Board found in the underlying proceeding that upon compliance with specific conditions set forth in the Footprint 12-2 Decision, construction and operation of the generating facility will provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost, in keeping with the Siting Board's statutory obligations under G.L. c. 164, § 69H. Footprint 12-2 Decision at 106. Nothing in the record of the instant proceeding changes any of the Siting Board's findings in the underlying proceeding. Additionally, nothing in the Settlement Agreement would require any change of these findings.

Accordingly, the Siting Board finds, that pursuant to G. L. c. 164, § 69O½, the public interest or convenience requires the construction and operation of the project as described in this proceeding.

### 4. Findings

The Siting Board has made the three findings that it must include in a Certificate in order to issue the Certificate pursuant to Section 69O½. Specifically, the Siting Board has found that: (1) granting a Certificate containing approvals for the project is compatible with considerations of environmental protection, public health and safety; (2) there is no evidence of non-compliance with any applicable state and local laws, ordinances, by-laws, rules or regulations; and (3) issuing such a Certificate would serve the public interest or convenience. The three findings made by the Siting Board support granting a Certificate for the project so that it may go forward, and the Siting Board hereby grants such a Certificate and includes the Settlement Agreement as a condition (see Condition C.11 in Exhibit A, below).

C. Scope of the Certificate

As noted in Section I.A.2, above, Footprint has requested that the Certificate include eight separate permits identified by the Company as necessary for project construction and operation. The Siting Board considers below which of these permits should be included in the Certificate.

1. The City of Salem Permits

a. Salem ZBA Approval

Footprint applied to the Salem ZBA on May 29, 2013 for: (1) a Special Permit for an Essential Service Use; and (2) Variances from the City's Dimensional Requirements (Exh. FP-2, at 9). The site is located in an Industrial Zoning District, which allows the construction of essential services (such as utility facilities) with a Special Permit (id.). The dimensional variance pertains to the request to exceed the maximum height allowance of 45 feet in an Industrial Zoning District (id.). The ZBA held a public hearing on June 19, 2013, and thereafter voted unanimously to approve the Company's application for the Special Permit and Variances subject to certain terms and conditions (id. at 10). The ZBA issued a written decision on June 28, 2013 (id.). As discussed above, Mr. Furlong and Mr. Dearstyne, appealed the Salem ZBA Approval on July 17, 2013 (id. at 12).

The City stated that it has no objection to including the Salem ZBA Approval in a Certificate, provided that all conditions contained in the permit and the written decision are included in their entirety (City Brief at 5). The Siting Board hereby determines that the Certificate issued in this proceeding shall include the Salem ZBA Approval issued by the Salem ZBA on June 28, 2013. The Salem ZBA Approval is incorporated in its entirety into the Certificate, as provided in Exhibit A.

b. Salem Planning Board Approval

Footprint applied on April 8, 2013 to the Salem Planning Board for: (1) Site Plan Approval; (2) a PUD Special Permit; and (3) a Special Permit for a Flood Hazard Overlay District (Exh. FP-2, at 12). All non-residential structures or premises exceeding 10,000 gross square feet must undergo Site Plan review (id.). The site is located within a Wetlands and Flood Hazard Overlay District and, therefore, to construct the proposed project a Flood Hazard District Special Permit is required (id.). The Planning Board held six public hearings on the Company's

application between May 2, 2013 and July 25, 2013 (*id.* at 12-13). The Planning Board voted unanimously on July 25, 2013, to approve the two Special Permits and the Site Plan subject to certain terms and conditions. The written decision was issued on August 1, 2013 (*id.*).

Mr. Furlong and Mr. Dearstyne appealed this decision on August 27, 2013.

The City stated that it has no objection to including in a Certificate: (1) the Site Plan Approval; (2) a PUD Special Permit; and (3) a Special Permit for a Flood Hazard Overlay District provided that all conditions contained in the permits and the written decision are included in their entirety (City Brief at 5). The Siting Board hereby determines that the Certificate issued in this proceeding shall include the Site Plan Approval, the PUD Special Permit, and the Special Permit for a Flood Hazard Overlay District issued by the Salem Planning Board on August 1, 2013. The Salem Planning Board Approval is incorporated in its entirety into the Certificate, as provided in Exhibit A.

c. Phase II Demolition Permit and Building Permit

Footprint applied to the Salem Inspectional Service Department for a Phase II Demolition Permit on November 18, 2013 (RR-EFSB-4).<sup>12</sup> The City provided the Siting Board with: (1) a draft Phase II Demolition Permit; and (2) a draft Building Permit, both issued December 23, 2013 (City Brief, Exhibit A and Exhibit B).<sup>13</sup> The City of Salem stated that Footprint has applied for all necessary permits from the City (City Brief, Briefing Question 1).

The City stated that it does not have concerns with the Siting Board issuing a Certificate containing a Phase II Demolition Permit and a Building Permit, as long as the conditions contained in the Salem Planning Board Approval are included (Exhs. EFSB-COS-1; EFSB-COS-3). In addition to adhering to the Planning Board decision, the City requested that the Certificate include a requirement that Footprint comply with all applicable federal, Massachusetts, and Salem statutes, regulations, guidelines, ordinances, and permitting conditions (City Brief at 5). Further, with

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<sup>12</sup> Footprint received a Phase I Demolition Permit from the Salem Inspectional Services Department on May 16, 2013; the permit was not appealed (Exh. FP-2, at 28).

<sup>13</sup> These exhibits have been entered into the record as Exhibits EFSB-COS-1(Supp) and EFSB-COS-3(Supp), respectively.

regard to all inspectional tasks, the City noted that Footprint has committed to a combination of “permit fee” inspections and “controlled construction” inspections for the project (*id.*).<sup>14</sup>

Both a demolition permit and a building permit may be appealed to the Massachusetts Board of Building Regulations and Standards within 45 days after the issuance of the permit (*see* G.L. c. 143 § 100; Exh. EFSB-COS-4). Further, an appeal may also be brought alleging a violation of the City’s zoning ordinance within 30 days after the issuance of the permit (*see* G.L. c. 40A § 8 and § 15; (Exh. EFSB-COS-4)).

The City stated that it has no objection to including a Phase II Demolition Permit and the Building Permit in a Certificate, provided that all conditions contained in the permits and the Salem Planning Board Approval, as well as adherence to a City-approved inspectional services plan are included. The Siting Board hereby determines that the Certificate issued in this proceeding shall include the equivalent of a Phase II Demolition Permit and a Building Permit. These approvals are included in Exhibit A.

## 2. MassDEP Chapter 91 Variance and Waterways License

Footprint applied to MassDEP for a Chapter 91 Waterways License and a Variance on May 17, 2013, and MassDEP determined the application to be administratively complete on July 26, 2013 (Exh. FP-2, at 24, 26). MassDEP issued a favorable Variance Request and Written Determination (“Written Determination”) on November 1, 2013 (Exhs. DEP-1; EFSB-DEP-5). The Written Determination stated that MassDEP would allow the project to proceed as a new non-water dependent use on filled tidelands within a Designated Port Area and that MassDEP would grant Footprint a Chapter 91 Waterways license if an appeal were not filed within 21 days (Exh. DEP-1, at 25). The Written Determination contained 17 Special Conditions and eight General Conditions that must be met by the Company in accordance with the approval

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<sup>14</sup> Permit fee inspections consist of a negotiated fee between Footprint and the City to allow inspections to be carried out under the auspices of the City either through consulting engineers or Inspectional Services staff. Controlled construction inspections are conducted and certified by Footprint architects or engineers, acting as agents for the City (City Brief at 5).

(Exh. EFSB-DEP-1). On November 22, 2013, CLF and others filed with MassDEP a request for an administrative appeal of the Written Determination (Exh. DEP-3, at 4).<sup>15</sup>

MassDEP stated that it has no objection to including the Written Determination in its entirety in a Certificate to be issued by the Siting Board in this proceeding as the final Chapter 91 License for the project, provided that all conditions contained in the Written Determination are included (Exhs. EFSB-DEP-GEN at 1-2; EFSB-DEP-5; Tr. 1, at 16). The Siting Board hereby determines that the Certificate issued in this proceeding shall include the equivalent of a final Chapter 91 License, which shall be the Written Determination and Variance decision issued by MassDEP on November 1, 2013. This approval is incorporated in Exhibit A.

### 3. Air Permits

In accordance with mandates under the federal Clean Air Act (“CAA”), the Company is required to obtain two permits that regulate the air emissions of the proposed project: a CPA Approval and a PSD Permit (Exh. EFSB-DEP-GEN at 6, 8). MassDEP issued the Proposed CPA Approval and the Draft PSD Permit together on September 9, 2013 (Exh. EFSB-DEP-GEN at 2). MassDEP held a public hearing on October 10, 2013 in Salem and accepted written public comments until November 1, 2013 (*id.*; Exh. EFSB-FP-4). MassDEP issued the Revised CPA Approval and the Revised PSD Permit on January 30, 2014. The Revised CPA Approval becomes a Final CPA Approval at the end of a 21-day appeal period, unless a request for an adjudicatory appeal is filed with MassDEP (Exh. EFSB-DEP-GEN at 3). The Revised PSD Permit becomes a Final PSD Permit at the end of a 30-day appeal period, unless the permit is appealed to the Environmental Appeals Board (“EAB”) of the U. S. Environmental Protection Agency (“USEPA”) (Exh. EFSB-DEP-GEN at 3).

Footprint asked the Siting Board to include in the Certificate both the CPA Approval and the PSD Permit (Exh. FP-2, at 26; Company Brief at 52). Footprint asserts that the Board may, and in fact, must, include both permits in the Certificate, primarily because the Certificate statute requires a certificate to include “all” permits necessary for construction and operation of a proposed energy facility (Company Brief, Briefing Question 2A). MassDEP asserts that the Board may include the CPA Approval, as it is a state permit, but may not include the PSD Permit, as it is

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<sup>15</sup> As part of the Settlement Agreement, on February 18, 2014 CLF withdrew its administrative appeal (Exh. FP/CLF-3).

a federal permit issued by MassDEP under delegation from the USEPA (MassDEP Brief, Exhibits 1 and 2). CLF asserts that the Board may not include either permit in the Certificate, as both permits have a federal component (CLF Brief at 4-5).

a. The CPA Approval

i. Footprint

Footprint asserts that the express language of the Certificate statute requires the Board to include the CPA Approval as a Certificate “*shall* be in the form of a composite of *all*” permits necessary for construction and operation of the generating facility (emphasis added) (Company Brief, Briefing Questions at 6-7, citing G.L. c. 164, § 69K½). Footprint argues secondarily that including the CPA Approval is consistent with other applicable language in the Certificate statute, which prohibits the inclusion of permits that “if so granted or modified by the appropriate state or local agency, would be invalid because of a conflict with federal air standards and requirements” (*id.*). Footprint argues that, since the Board would be incorporating the CPA Approval exactly as issued by MassDEP, no conflict with federal air standards or requirements would occur (*id.* at 7). Footprint indicates that it would view as acceptable a Certificate incorporating either the Revised CPA Approval (subsequently issued by MassDEP on January 30, 2014) or the Final CPA Approval issued by MassDEP after the conclusion of any administrative appeal process (Footprint Opposition to CLF Motion to Dismiss at 19).

ii. MassDEP

MassDEP asserts that a CPA Approval is a state permit, and that the Board may include a CPA Approval in a Certificate as long as the Board incorporates the Approval exactly as issued by MassDEP (MassDEP Brief at 2-3). MassDEP states that the Board may include in the Certificate either the Revised CPA Approval or the Final CPA Approval (*id.* at 4). In a reversal of its pre-hearing position, MassDEP asserts in its brief that its research shows that the federal CAA does not require MassDEP to provide an opportunity for administrative appeal of a CPA; therefore, in MassDEP’s view, the Board may include either the Revised CPA Approval or the Final CPA Approval in the Certificate without causing a conflict with federal requirements (*id.* at 3-4). MassDEP advises the Board, in making its choice, to balance the competing interests of: (1) allowing the administrative appeal process to go forward, and thus allowing MassDEP to

receive evidence that could lead to further revisions to the Revised CPA Approval; and (2) eliminating the administrative appeal, and any subsequent state court appeals, of the Revised CPA Approval and thus avoiding possibly significant project delay (id. at 4-6).

iii. CLF

CLF asserts that the Board is preempted from including the CPA Approval in the Certificate because the MassDEP regulations governing such permits were incorporated into the state's federally approved State Implementation Plan ("SIP"), and thus "became federal law" (CLF Brief at 7). CLF also asserts that only an agency "which has demonstrated that it meets all the requirements of the CAA may issue permits and implement requirements of the SIP" and that the Board lacks any such authority under the CAA (id.).<sup>16</sup>

iv. USEPA

The USEPA did not intervene, testify, or otherwise participate in the proceeding. However, MassDEP submitted as an exhibit a November 13, 2013 letter from USEPA to MassDEP, in which the USEPA stated that "the EFSB is not authorized, for federal CAA purposes, to issue or modify either a CPA under the Massachusetts SIP or a PSD permit under the Delegation Agreement" (Exh. EFSB-DEP-GEN, Exhibit C).

v. Analysis and Findings

The record shows that MassDEP issues CPA Approvals pursuant to Massachusetts state law and regulations. As stated on the cover page to the proposed CPA Approval itself, for example, MassDEP issued that approval pursuant to "310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 'Air Pollution Control' regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-J, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6" (Exh. EFSB-FP-4-1).

MassDEP, the agency with authority to issue CPA Approvals in Massachusetts, is of the view that a CPA Approval, if unmodified by the Siting Board, is a state permit that may be included in a Certificate. Although a USEPA staff member has stated in a letter to MassDEP that

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<sup>16</sup> CLF made these arguments prior to submission of the Settlement Agreement.

the Siting Board “is not authorized . . . to issue or modify” a CPA Approval, the letter does not address the possibility that the Siting Board might adopt a Revised or Final CPA Approval, as issued by MassDEP, without modification. The USEPA statement is conclusory and is outweighed by the careful and comprehensive analysis provided by MassDEP.<sup>17</sup> The Siting Board concludes that, in Massachusetts, CPA Approvals are state permits and, accordingly, that the Siting Board is authorized by G.L. c. 164, § 69K½ to include in a Certificate a CPA Approval issued by MassDEP for the Footprint generating facility.

Originally, MassDEP took the position that the Board could not include the Revised CPA Approval in the Certificate, but could include the Final CPA Approval – after the MassDEP administrative appeal process is concluded. Significantly, MassDEP revised its position, and now expresses the view that the Board may include either version of the Approval in the Certificate. Including the Revised CPA Approval in the Certificate would preclude both administrative and judicial appeals of the Approval. This would eliminate potentially significant delay in the commencement of facility construction, consistent with the intent of the Certificate statute.

Allowing the MassDEP administrative appeal process to go forward would allow for further public input in the permitting process, and accordingly could result in further changes by MassDEP to the Revised CPA Approval. MassDEP has indicated that it would expedite the administrative appeal process in this case, and that a Final CPA Approval could be issued within six months of the filing of a request for an adjudicatory hearing (Tr. 1, at 19-20). Additionally, Footprint has stated that it would not oppose any permit conditions arrived at through the administrative appeal process, and that the Company is willing to accept inclusion of the Final CPA Approval, rather than the Revised CPA Approval in the Certificate.

Notwithstanding MassDEP’s agreement to limit the appeal process, its Final CPA Approval would be subject to further appeals in the courts. Thus, the potential for project delay attributable to allowing the administrative appeal process to go forward ultimately may be significant and could prevent timely construction of the project. The Siting Board hereby includes

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<sup>17</sup> This position reflects particularly thorough research and analysis by MassDEP; the agency submitted over 100 pages of pleadings and briefing in this proceeding. *See, e.g.*, MassDEP Responses to EFSB Information Requests (November 15, 2013; MassDEP Response to CLF Motion to Dismiss (December 5, 2013); MassDEP Brief and Responses to EFSB Briefing Questions (December 24, 2013).

the Revised CPA Approval, as issued on January 30, 2014, in the Certificate issued in this proceeding. This approval is included in Exhibit A.

b. PSD Permit

i. Footprint

As with the CPA Approval, Footprint asserts that the Certificate statute not only authorizes, but requires, the Siting Board to include the PSD Permit in the Certificate (Company Brief, Briefing Questions at 10). Again, Footprint asserts that, as long as the PSD Permit is incorporated exactly as issued by MassDEP, no conflict with federal law results (*id.* at 10-11). Footprint asserts that USEPA delegated implementation of the PSD program to MassDEP in a 2011 Delegation Agreement, and that language in the Delegation Agreement referencing the Siting Board “affirms the Siting Board’s authority to issue certificates which contain PSD requirements” (*id.* at 11).

ii. MassDEP and CLF

MassDEP and CLF both assert that the PSD Permit is a federal permit, and as such, is not a state or local permit that can be included in a Certificate (CLF Brief at 4; MassDEP Brief, Exh. 2, at 3-5) (*see* G.L. c. 164, § 69K½: the EFSB is authorized to issue Certificates that include “state or local agency” permits). MassDEP notes that, in contrast to CPA Approvals, MassDEP has not promulgated any regulations that authorize MassDEP to issue PSD Permits under the applicable state statute (G.L. c. 111, § 142A-142N) nor included the PSD permitting program in its SIP. As a result, there currently is no Massachusetts state program for issuing federally required PSD Permits, and MassDEP issues such permits exclusively under federal law and regulations (MassDEP Brief, Exh. 2, at 1).

iii. Analysis and Findings

The record shows that MassDEP issues PSD Permits pursuant to federal, not state, law. As stated in the Draft PSD Permit itself, for example, MassDEP issues PSD Permits “pursuant to the provisions of the Clean Air Act (CAA) Chapter 1, Part C (42 USC Section 7470 *et seq.*), the regulations found at the Code of Federal Regulations Title 40, Section 52.21, and the Agreement for Delegation of the Federal Prevention of Significant Deterioration Program” from USEPA Region I to MassDEP, dated April 11, 2011 (Exh. EFSB-FP-4-2). The Delegation Agreement

states that MassDEP “agrees to implement and enforce the federal PSD regulations as found in 40 CFR 52.21” (Exh. EFSB-DEP-GEN, Exh. A). The Delegation Agreement also contains numerous other provisions supporting the proposition that PSD Permits are creatures of federal law, including the requirement that MassDEP “follow USEPA policy, guidance and determinations” in issuing such permits, and the right of EPA to issue the permit in place of MassDEP if MassDEP and USEPA disagree on certain substantive components of the permit (*id.*). Further, unlike CPA Approvals, which are appealable to MassDEP and then to state court, PSD Permits are appealable exclusively to USEPA’s EAB and then to federal court. 40 CFR 124.19; 42 USC §7607.

Case law from both the federal courts and the USEPA EAB has uniformly held that a PSD Permit issued by a state pursuant to a delegation agreement with USEPA is considered a federal, USEPA-issued, permit. *See, e.g., Greater Detroit Resource Recovery Authority and Combustion Engineering v. U.S. EPA*, 916 F. 3d 317 (6<sup>th</sup> Cir. 1990); *In re Seminole Electric Corp., Inc.*, PSD Appeal No. 08-09, USEPA Environmental Appeals Board (September 22, 2009).

Both the regulatory structure of the PSD program in Massachusetts and relevant federal case law support the conclusion that the PSD Permit is a federal permit. The Board’s authority under the Certificate statute is limited to the issuance of state and local permits; preventing an appeal of the PSD Permit to the federal EAB and federal court would conflict with requirements of federal law, as prohibited by the Certificate statute. Accordingly, the Siting Board will not include the requested PSD Permit in the Certificate issued in this proceeding.

#### 4. Above Ground Storage Tank Construction Permit and Use Permit

Approval from the State Fire Marshal is required for the construction, maintenance or use of the 34,000-gallon ammonia tank because the tank exceeds the 10,000-gallon regulatory threshold (Exhs. EFSB-FP-1; EFSB-SFM-Attachment 1). According to 502 CMR 5.00, two separate permits are required – a Permit to Construct (*see* 502 CMR 5.04(3)(a)) and a Use Permit (*see* 502 CMR 5.04(3)(d)) (Exhs. EFSB-FP-1; EFSB-SFM, Attachment 1). With regard to the Permit to Construct, regulations require that construction of the new tank must begin within six months of the date of the permit, and that the tank must be completed within one year of commencement of construction (Exh. EFSB-SFM-1). In conjunction with the state permitting scheme for the ammonia tank, the Salem City Council approved a Fuel Storage Tank Permit and Inflammables License on September 26, 2103 (Exh. EFSB-FP-6). The Company stated that this

approval fulfills the requirement of the State Fire Marshal that applicants who are seeking an Above Ground Storage Tank Permit obtain a land license from the municipal fire department prior to submitting the application for construction and installation of the tank (RR-FP-1).

The State Fire Marshal stated that he has no specific concerns with the Siting Board issuing a Permit to Construct as long as the Company complies with all applicable codes, standards and good engineering practices (Exh. EFSB-SFM-1). Specifically, the Company and its contractors must comply with G.L. c. 148 § 37, 780 CMR, 502 CMR 5.04, 527 CMR 9.03, 527 CMR 14.03, and 2003 NFPA 30 (Exh. EFSB-SFM-1). Further, the State Fire Marshal stated that he has no specific concerns with the Siting Board issuing a Use Permit as long as the Company complies with all applicable codes, standards and good engineering practices (Exh. EFSB-SFM-2). Specifically, the Company and its contractors must comply with G.L. c. 148 § 37, 502 CMR 5.05 and 502 CMR 5.06 (Exh. EFSB-SFM-2).

The Certificate statute requires an applicant to include in its Application “a representation as to the good faith effort made by the applicant to obtain” the permits the applicant seeks to include in the Certificate. G.L. c. 164, § 69L½. CLF argues that because Footprint has not yet applied for the State Fire Marshal permit, the Company has failed to satisfy the statute’s good faith effort requirement. Footprint argues that it is premature or futile to apply for this permit now because: (1) State Fire Marshal regulations require the Company to begin work on the storage tank within six months of the permit-issuance date and, largely because of the uncertainty regarding the timing of other facility permits, it is not yet clear when Footprint will be permitted to begin that work; (2) preparing an application to the State Fire Marshal will require expenditures of “millions of dollars” in detailed engineering design, and Footprint cannot make such expenditures until it has closed on its project financing, which is anticipated in February 2014; and (3) the tank Use Permit cannot be applied for until after the tank has been constructed (Company Brief, Briefing Questions at 3-4). Footprint argues that the Siting Board should not interpret the good faith effort language in the statute to require an applicant to file permit applications where to do so would be unreasonable or futile (*id.*). Footprint in its brief cites to state court cases interpreting good faith in a uniform commercial code context supporting such an interpretation of “good faith effort.” (*id.* at 3-5).

The record shows that Footprint cannot reasonably obtain, or even apply for, the State Fire Marshal permit for its proposed ammonia storage tank at this stage in the project’s development.

The Siting Board notes that, in applying for and obtaining the necessary City permit for the storage tank, Footprint has completed a necessary prerequisite for applying for the Fire Marshal permit. The Siting Board finds that the “good faith effort” language in the Certificate statute is satisfied where, as here, actually applying for a particular permit would be futile or is not reasonable under the circumstances.

The State Fire Marshal has stated that it has no objection to including an Above Ground Storage Tank Construction Permit and Use Permit in a Certificate, provided that the Company complies with all applicable codes, standards, and good engineering practices as delineated above. The Siting Board hereby determines that the Certificate issued in this proceeding shall include the equivalent of an Above Ground Storage Tank Construction Permit and Use Permit. This approval is included in Attachment 3.

#### IV. CONCLUSION

The Siting Board GRANTS the Initial Petition and the Application of Footprint Power Salem Harbor Development LP, for a Certificate of Environmental Impact and Public Interest, pursuant to G.L. c. 164, § 69 K½. The Certificate granted “shall be in the form of a composite of all individual permits, approvals, or authorizations which would otherwise be necessary for the construction and operation of the facility.” To that end, the granted Certificate is a composite permit including the equivalent of: (1) the Salem ZBA Approval; (2) the Salem Planning Board Approval; (3) a City of Salem Phase II Demolition Permit; (4) a City of Salem Building Permit; (5) a MassDEP Chapter 91 License; (6) a MassDEP Final CPA Approval; and (7) a State Fire Marshal Above Ground Storage Tank Construction Permit and Use Permit.

This Decision, the appended Certificate of Environmental Impact and Public Interest, and the seven approvals contained in the Certificate each are conditioned on compliance by the Company with Conditions C.1 through C.11 set forth in the Certificate.

*M. Kathryn Sedor*

M. Kathryn Sedor  
Presiding Officer

Date: the 25th day of February, 2014

*M. Kathryn Sedor*

**COMMONWEALTH OF MASSACHUSETTS  
ENERGY FACILITIES SITING BOARD**

|  |                       |           |
|--|-----------------------|-----------|
| In the Matter of the Petition of Footprint Power<br>Salem Harbor Development LP for a Certificate<br>of Environmental Impact and Public Interest | )<br>)<br>)<br>)<br>) | EFSB 13-1 |
|--|-----------------------|-----------|

**EXHIBIT A TO FINAL DECISION IN EFSB 13-1**

**CERTIFICATE OF ENVIRONMENTAL IMPACT AND  
PUBLIC INTEREST**

Pursuant to its authority under G.L. c.164, §§ 69K½ -69O½, the Energy Facilities Siting Board hereby: (1) grants the Initial Petition and the Application of Footprint Power Salem Harbor Development LP (“Footprint” or Company”); and (2) issues this Certificate of Environmental Impact and Public Interest (“Certificate”) to Footprint. This Certificate constitutes Exhibit A to, and is part of, the Final Decision in EFSB 13-1.

**I. SCOPE OF CERTIFICATE**

In accordance with G.L. c. 164, § 69K½, this Certificate is in the form of a composite of all individual state and local permits, approvals or authorizations requested by the applicant, which would otherwise be necessary for the construction and operation of the facility and it acts in the place of the seven permits referenced below. The Certificate authorizes the applicant to construct a 630 MW natural gas-fired, quick-start, combined-cycle facility at the present location of the Salem Harbor Station in Salem, Massachusetts, as approved and conditioned by the Siting Board in Footprint Power Salem Harbor Development LP, EFSB 12-2 (October 10, 2013) (“Footprint 12-2 Decision”).

## II. APPROVALS

This Certificate contains the following seven approvals (collectively, “Approvals”):

1. A final approval that comprises a Special Permit for an Essential Service Use pursuant to Section 3.0 of the City of Salem’s Zoning Ordinance Use Regulations, and Variances from the City's Dimensional Requirements pursuant to Section 4.0 of the Zoning Ordinance, issued by the Salem Zoning Board of Appeals on June 28, 2013 (“Salem ZBA Approval”). The Salem ZBA Approval is marked as Exhibit FP-1, App. D in the EFSB 13-1 Certificate proceeding and is incorporated by reference in its entirety into this Certificate.
2. A final approval that comprises (1) the Site Plan Approval; (2) the Planned Unit Development Special Permit; and (3) the Special Permit for a Flood Hazard Overlay District, pursuant to G.L. c. 40A and Sections 7.3, 8.1 and 9.5, respectively, of the Salem Zoning Ordinance, issued by the Salem Planning Board on August 1, 2013 (“Salem Planning Board Approval”). The Salem Planning Board Approval is marked as Exhibit EFSB-COS-1(a)-1 in the EFSB 13-1 Certificate proceeding and is incorporated by reference in its entirety into this Certificate.
3. A final approval that is the equivalent of a Phase II Demolition Permit of existing buildings, pursuant to Chapter 12 of the Salem Code of Ordinances, ordinarily issued by the Salem Inspectional Services Department. This approval is appended hereto as Attachment 1.
4. A final approval that is the equivalent of a Building Permit for new construction, pursuant to Chapter 12 of the Salem Code of Ordinances, ordinarily issued by the Salem Inspectional Services Department. This approval is appended hereto as Attachment 2.

5. A final approval that is the equivalent of a Chapter 91 License, ordinarily issued by the Massachusetts Department of Environmental Protection (“MassDEP”) pursuant to G.L. c. 91. This approval comprises the “Written Determination” pursuant to M.G.L. c. 91, Waterways Application No. W13-3886-N issued by MassDEP to Footprint on November 1, 2013. This approval is marked as Exhibit DEP-1 in the EFSB 13-1 Certificate proceeding and is incorporated by reference in its entirety into this Certificate.
6. A final approval that is the equivalent of a Final Comprehensive Plan Approval (“CPA”), ordinarily issued by Mass DEP pursuant to G.L. c. 111 §§ 142A – 142N and 310 CMR 7.00. This approval comprises the Revised CPA Approval issued by MassDEP on January 30, 2014. The Revised CPA Approval is marked as Exhibit DEP-4 in the EFSB 13-1 Certificate proceeding and is incorporated by reference in its entirety into this Certificate.
7. A final approval that is the equivalent of a combined State Fire Marshal Above Ground Storage Tank Construction Permit and Use Permit, pursuant to G.L. c. 148, § 37, ordinarily issued by the Massachusetts Department of Public Safety, Office of the State Fire Marshal. This approval is appended hereto as Attachment 3.

### III. CONDITIONS

The granting by the Siting Board of this Certificate and each of the Approvals herein is subject to the following conditions:

- C.1 Conditions A-W of the Footprint 12-2 Decision are incorporated by reference into and are conditions to this Certificate.

C.2 The applicant shall comply with all applicable federal, Massachusetts, and City of Salem statutes, regulations, guidelines, ordinances and permitting conditions in the demolition of the existing power plant and structures, and in the construction and operation of the proposed project.

C.3 With regard to the four permits issued by the City of Salem and the approval that is the equivalent of a combined State Fire Marshal Above Ground Storage Tank Construction Permit and Use Permit, the applicant must allow the City of Salem to have a meaningful opportunity to review the issues related to the permits, and to inspect construction of the tank as it progresses. With respect to the four City of Salem permits, the applicant must allow the City to retain its enforcement authority, as provided in G.L. 164, § 69K

C.4 With respect to the four City of Salem permits, the applicant must file with the City of Salem, for approval by the City, an inspectional services plan that provides for the scheme of the required inspectional tasks through a combination of permit fee and controlled construction inspections for the demolition, construction, and operation of the proposed project.

C.5 The Footprint 12-2 Decision provides that construction of the proposed project must begin within three years of the issuance date of that Decision, *i.e.*, around and about October 10, 2016. This Certificate does not change that date. Each of the seven approvals granted in this Certificate also shall expire on or about October 10, 2016, if construction of the project has not yet begun by that date. Extensions may be granted by written request to the Siting Board filed prior to the expiration date.

C.6 The applicant has an absolute obligation to construct the project in conformance with all aspects of the project as presented to and approved by the Siting Board in the Footprint 12-2 Decision. The applicant is required to notify the Siting Board of any changes other than minor variations to the project so that the Siting Board may determine whether to inquire further into a particular issue. The applicant is obligated to provide the Siting Board with sufficient information on changes to the project to enable the Siting Board to make these determinations.

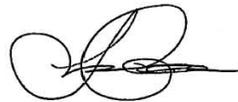
C.7 The applicant shall provide a copy of this Certificate, including all Attachments, to its general contractor prior to the commencement of construction.

C.8 In accordance with G.L. c. 164, § 69K½, no agency listed in Section II of this Certificate shall require any approval, consent, permit, certificate or condition for the construction, operation, or maintenance of the project. No agency listed in Section II shall impose or enforce any law, ordinance, by-law, rule or regulation nor take any action nor fail to take any action which would delay or prevent construction, operation, or maintenance of the project.

C.9 In accordance with G.L. c. 164, § 69K½, that portion of the Certificate which relates to subject matters within the jurisdiction of the state or local agencies listed in Section II shall be enforced by such agency as if it had been directly granted by such agency.

C.10 This Certificate shall be appealable only by timely appeal of the EFSB 13-1 Footprint Certificate Decision to the Massachusetts Supreme Judicial Court, in accordance with G.L. c. 25, § 5 and G. L. c.164, § 69P.

C.11 The Settlement Agreement between CLF and Footprint dated February 18, 2014 and attached to this Certificate as Exhibit A, Attachment 4, is a condition of this Certificate. By attaching the Settlement Agreement as a condition, the Siting Board does not, and cannot, cede its responsibility to decide future proceedings in accordance with applicable statutory and regulatory requirements and the specific facts of each case. The Settlement Agreement is a private agreement between two parties to this proceeding, Footprint and CLF. The parties' expression of their intention concerning future Siting Board proceedings does not bind the Siting Board. Additionally, nothing in the Settlement Agreement changes the Board's standard of review for intervention. Footprint shall provide to the Siting Board all documentation described in the Settlement Agreement necessary to report on its compliance with the Settlement Agreement.



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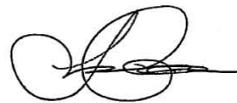
Steven Clarke, Acting Chair  
Energy Facilities Siting Board

**ATTACHMENT 1**

**EFSB 13-1, FOOTPRINT POWER SALEM HARBOR DEVELOPMENT LP  
CERTIFICATE OF ENVIRONMENTAL IMPACT AND PUBLIC INTEREST**

**APPROVAL IN LIEU OF A PHASE II DEMOLITION PERMIT**

1. Pursuant to its authority under G.L. c. 164, §§ 69K½ -69O½, the Energy Facilities Siting Board hereby grants to Footprint Power Salem Harbor Development LP an Approval in lieu of a Phase II Demolition Permit from the Salem Inspectional Services Department. This Approval authorizes construction and operation of the project as approved by the Energy Facilities Siting Board in Footprint Power Salem Harbor Development LP, EFSB 12-2 (October 10, 2013).
2. This Approval is issued subject to Conditions C.1 through C.11 in the Certificate of Environmental Impact and Public Interest that is appended as Exhibit A to the Final Decision, Footprint Certificate Decision, EFSB 13-1 (February 25, 2014).
3. The Approval incorporates in its entirety the draft Phase II Demolition Permit and all attachments issued by the Salem Inspectional Services Department on December 23, 2013, marked as Exhibit City of Salem Brief, Exhibit A and Exhibit EFSB-COS-1(Supp) in the EFSB 13-1 Certificate proceeding.
4. This Approval incorporates all of the conditions contained in the Salem Planning Board Approval, issued by the Salem Planning Board on August 1, 2013, marked as Exhibit EFSB-COS-1(a)-1 in the EFSB 13-1 Certificate proceeding.
5. The applicant and its contractors must comply with any other requirements of the Salem Inspectional Services Department pertaining to demolition on the project site.
6. The applicant and its contractors must conform to all applicable statutes, regulations, codes, standards and good engineering practices.




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Steven Clarke, Acting Chair  
Energy Facilities Siting Board

**ATTACHMENT 2****EFSB 13-1, FOOTPRINT POWER SALEM HARBOR DEVELOPMENT LP  
CERTIFICATE OF ENVIRONMENTAL IMPACT AND PUBLIC INTEREST****APPROVAL IN LIEU OF A BUILDING PERMIT**

1. Pursuant to its authority under G.L. c. 164, §§ 69K½ -69O½, the Energy Facilities Siting Board hereby grants to Footprint Power Salem Harbor Development LP an Approval in lieu of a Building Permit from the Salem Inspectional Services Department. This Approval authorizes construction and operation of the project as approved by the Energy Facilities Siting Board in Footprint Power Salem Harbor Development LP, EFSB 12-2 (October 10, 2013).
2. This Approval is issued subject to Conditions C.1 through C.11 in the Certificate of Environmental Impact and Public Interest that is appended as Exhibit A to the Final Decision, Footprint Certificate Decision, EFSB 13-1 (February 25, 2014).
3. The Approval incorporates in its entirety the draft Building Permit and all attachments issued by the Salem Inspectional Services Department on December 23, 2013, marked as Exhibit City of Salem Brief, Exhibit B and Exhibit EFSB-COS-3(Supp) in the EFSB 13-1 Certificate proceeding.
4. This Approval incorporates all of the conditions contained in the Salem Planning Board Approval, issued by the Salem Planning Board on August 1, 2013, marked as Exhibit EFSB-COS-1(a)-1 in the EFSB 13-1 Certificate proceeding.
5. The applicant and its contractors must comply with any other requirements of the Salem Inspectional Services Department, including but not limited to requirements related to pre-construction and post-construction inspection of the proposed project.
6. The applicant and its contractors must conform to all applicable statutes, regulations, codes, standards and good engineering practices.

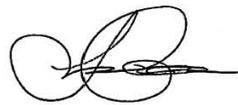


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Steven Clarke, Acting Chair  
Energy Facilities Siting Board

**ATTACHMENT 3****EFSB 13-1, FOOTPRINT POWER SALEM HARBOR DEVELOPMENT LP  
CERTIFICATE OF ENVIRONMENTAL IMPACT AND PUBLIC INTEREST****APPROVAL IN LIEU OF A STATE FIRE MARSHAL ABOVE GROUND  
CONSTRUCTION PERMIT AND USE PERMIT**

1. Pursuant to its authority under G.L. c. 164, §§ 69K½ -69O½, the Energy Facilities Siting Board hereby grants to Footprint Power Salem Harbor Development LP an Approval in lieu of a State Fire Marshal Above Ground Construction Permit and Use Permit from the Office of the State Fire Marshal, Massachusetts Department of Public Safety. This Approval authorizes construction and operation of the project as approved by the Energy Facilities Siting Board in Footprint Power Salem Harbor Development LP, EFSB 12-2 (October 10, 2013).
2. This Approval is issued subject to Conditions C.1 through C.11 in the Certificate of Environmental Impact and Public Interest that is appended as Exhibit A to the Final Decision, Footprint Certificate Decision, EFSB 13-1 (February 25, 2014).
3. The applicant and its contractors must conform to all applicable statutes, regulations, codes, standards and good engineering practices, including but not limited to: (1) G.L. c. 148 § 37, 780 CMR, 502 CMR 5.04, 527 CMR 9.03, 527 CMR 14.03, and 2003 NFPA 30 for the Construction Permit; and (2) G.L. c. 148 § 37, 502 CMR 5.05 and 502 CMR 5.06 for the Use Permit.
4. The applicant and its contractors must comply with any other requirements of the State Fire Marshal or Department of Public Safety, including but not limited to requirements related to pre-construction and post-construction inspection of the proposed aboveground ammonia storage tank.



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Steven Clarke, Acting Chair  
Energy Facilities Siting Board

**ATTACHMENT 4**

**EFSB 13-1, FOOTPRINT POWER SALEM HARBOR DEVELOPMENT LP  
CERTIFICATE OF ENVIRONMENTAL IMPACT AND PUBLIC INTEREST**

**SETTLEMENT AGREEMENT BETWEEN CONSERVATION LAW  
FOUNDATION AND FOOTPRINT POWER SALEM HARBOR**

## SETTLEMENT AGREEMENT

This **SETTLEMENT AGREEMENT** (“Agreement”) is entered into by and among the Conservation Law Foundation, (“CLF”) and Footprint Power Salem Harbor Development LP (“Footprint Power”) (hereinafter collectively referred to as, the “Parties”), as of the 18th day of February, 2014 (“Effective Date”).

**WHEREAS:** Footprint Power submitted a petition to construct a generating facility pursuant to G.L. c. 164, §§ 69H and 69J¼ to the Massachusetts Energy Facilities Siting Board (“Siting Board”) on August 3, 2012 which was docketed as EFSB 12-2 (the “EFSB Approval Case”). The Siting Board issued a Final Decision (“EFSB Final Decision”), dated October 10, 2013, approving Footprint Power’s petition to construct a nominal 630 MW natural gas-fired, quick start, electric generation facility (the “Facility”) with certain conditions.

**WHEREAS:** Footprint Power submitted an Initial Petition in August 2013 and Application for a Certificate of Environmental Impact and Public Interest in October 2013 pursuant to G.L. c. 164, §§ 69K ½ to 69O½ to the Siting Board, which was docketed as EFSB 13-1 (the “EFSB Certificate Case”). The Siting Board issued a Tentative Decision, dated February 4, 2014, on Footprint Power’s Initial Petition for a Certificate of Environmental Impact and Public Interest (“EFSB Tentative Decision”) proposing to issue a composite certificate incorporating all state and local permits, approvals or authorizations that would otherwise be necessary to construct and operate the Facility.

**WHEREAS:** The Massachusetts Department of Environmental Protection (“MassDEP”) issued the following approvals in connection with the Facility:

- (1) Decision on Variance Request and Written Determination (“DEP Variance/Written Determination”) dated November 1, 2013 pursuant to its authority under M.G.L. Chapter 91 and waterways regulations at 310 CMR 9.00;
- (2) Air Quality Plan Approval dated January 30, 2014 (the “CPA Approval”) pursuant to its authority under M.G.L. Chapters 111, § 142A-J, 21C, §§ 4 and 6, 21E, § 6, and air pollution control regulations at 310 CMR 7.00: Appendix A, the Nonattainment New Source Review Program established pursuant to the requirements of the federal Clean Air Act at 42 U.S.C. § 7502 and § 7503 and implemented through the regulations approved by EPA pursuant to 42 U.S.C. § 7410; and
- (3) Prevention of Significant Deterioration Permit (“PSD Approval”) dated January 30, 2014, under 42 U.S.C. §§ 7470 *et seq.*, 40 C.F.R. § 52.21, and the Agreement for Delegation of the Federal Prevention of Significant Deterioration Program, dated April 2011, by the United States Environmental Protection Agency, (Region 1) to the MassDEP.

**WHEREAS:** CLF has challenged the legality of the EFSB Final Decision, the EFSB Tentative Decision, the DEP Variance/Written Determination, and has intervened in the CPA Approval and the PSD Approval as follows:

- (1) On November 8, 2013, CLF filed with the Supreme Judicial Court a Petition for Appeal of the EFSB Final Decision (“EFSB Appeal”);
- (2) On November 8, 2013, CLF filed with MassDEP a Motion for Mandatory Intervention in the Matter of Footprint Power Salem Harbor Development LP, Transmittal No. X254064, Application No. NE-12-022 (“Air Permitting Proceeding”); and
- (3) On November 22, 2013, CLF filed with the MassDEP Office of Appeals and Dispute Resolution (“OADR”) a Notice of Claim for an Adjudicatory Appeal and Request for Adjudicatory Hearing with respect to the DEP Variance/Written Determination (“DEP Appeal”).

Items (1) through (3) above are collectively referred to as the “Appeals.”

**WHEREAS:** The Appeals are currently pending before their respective tribunals.

**WHEREAS:** The Commonwealth of Massachusetts enacted the Global Warming Solutions Act, Chapter 298 of the Acts of 2008 (“GWSA”), in order to, among other things, reduce greenhouse gas (“GHG”) emissions to at least 80% below 1990 levels by 2050 (the “GWSA 2050 mandate”).

**WHEREAS:** The petition filed by Footprint Power is the first petition to construct a generating facility filed with the EFSB since the enactment of the GWSA and therefore there is no precedent with respect to the proper standard nor the scope and type of information necessary to demonstrate a proposed facility’s consistency with the GWSA in general or the GWSA 2050 mandate in particular.

**WHEREAS:** There are currently no regulations in place that provide guidance to applicants before the EFSB or other agencies of the Commonwealth with respect to demonstrating consistency with the GWSA 2050 mandate.

**WHEREAS:** Achieving the GWSA 2050 mandate is an essential element in mitigating the impacts of climate change on the Commonwealth’s environment.

**WHEREAS:** The Parties have engaged in settlement discussions to determine the appropriate basis to measure and demonstrate compliance with the GWSA and have arrived at a framework that demonstrates the Facility’s compliance with the GWSA 2050 mandate and that provides a potential set of minimum enforceable conditions that should be met for future applicants seeking to demonstrate compliance of future facilities.

**WHEREAS:** The absence of regulations imposing GHG emissions limits for the power sector as set forth in the GWSA makes it difficult for proposed natural gas power plant infrastructure to demonstrate conformity with the GWSA and the Act's deep emission reduction requirements. Although stack GHG emissions from natural gas combustion are lower than emissions from combusting coal or oil, natural gas is still a fossil fuel which results in substantial amounts of GHG emissions.

**WHEREAS:** To the extent that electricity generated from natural gas replaces electricity generated from coal or oil, it can result in decreased GHG emissions. However, the substantial GHG emissions resulting from natural gas combustion require that new natural gas infrastructure, including generating facilities, must be appropriately conditioned to require emission limits in conformance with the GWSA mandates. Such conditions must assure that sector-wide GHG emissions, inclusive of GHG emissions from new natural gas infrastructure including generating facilities, are at or below the 80% reduction level by 2050.

**WHEREAS:** The Parties agree that the conditions established in this settlement agreement, including the adoption of declining annual carbon dioxide emission limits and a limitation on the useful life of a facility, represent the types of threshold conditions that may permit new fossil fuel infrastructure, including generating facilities, to demonstrate compliance with the GWSA, including the GWSA's 2050 mandate.

**WHEREAS:** The Facility has been designed as an efficient and flexible generating solution capable of supplanting less efficient, more highly polluting facilities and includes quick start capabilities that may provide reliability services or firming support for renewable resources, a critical element of reaching the GWSA 2050 mandate.

**WHEREAS:** The Parties have raised competing and disputed claims with regard to various issues contained in the Tentative Decision and the Appeals but have agreed that it is in their mutual interest to resolve and settle the matters raised in the Appeals upon the terms and conditions more fully set forth herein, such resolution and settlement being without any admission by the Parties of any fault or liability or any legal issue not explicitly addressed in this Agreement.

**WHEREAS:** The Massachusetts Executive Office of Energy and Environmental Affairs has made certain commitments to CLF related to continuing its efforts to achieve the GWSA objectives, as embodied in a "Commitment Letter" enumerating future actions by Massachusetts.

**NOW, THEREFORE:** In consideration of the following mutual promises, agreements and covenants set forth herein and for other good and valuable consideration, the Parties agree,

subject to approval and incorporation, without modification, of this Agreement into the Certificate of Environmental Impact and Public Interest granted by the EFSB, as follows:

**1. Additional Measures Regarding Greenhouse Gases.**

In addition to the requirements set forth in the CPA Approval and the PSD Permit (collectively, with this Agreement, the “Permits”), the parties agree that, provided that CLF fully complies with the terms of this Agreement:

- a. GHG Reductions. Subject to the following provisions, the annual Facility-Wide emissions of CO<sub>2e</sub> (“CO<sub>2e</sub> Cap”), from the date of commencement of commercial operation of the Facility through the end of calendar year 2025, shall not exceed 2,279,530 tons per year (“tpy”), and, thereafter, the CO<sub>2e</sub> Cap shall be reduced in amounts consistent with the GWSA mandate of at least 80% reductions of GHG from 1990 levels, as follows:

| Year | CO <sub>2e</sub> Cap (tpy) | Year | CO <sub>2e</sub> Cap (tpy) | Year | CO <sub>2e</sub> Cap (tpy) |
|------|----------------------------|------|----------------------------|------|----------------------------|
| 2016 | 2,279,530                  | 2028 | 2,060,698                  | 2040 | 1,185,370                  |
| 2017 | 2,279,530                  | 2029 | 1,987,754                  | 2041 | 1,112,426                  |
| 2018 | 2,279,530                  | 2030 | 1,914,810                  | 2042 | 1,039,482                  |
| 2019 | 2,279,530                  | 2031 | 1,841,866                  | 2043 | 966,538                    |
| 2020 | 2,279,530                  | 2032 | 1,768,922                  | 2044 | 893,594                    |
| 2021 | 2,279,530                  | 2033 | 1,695,978                  | 2045 | 820,650                    |
| 2022 | 2,279,530                  | 2034 | 1,623,034                  | 2046 | 747,706                    |
| 2023 | 2,279,530                  | 2035 | 1,550,090                  | 2047 | 674,762                    |
| 2024 | 2,279,530                  | 2036 | 1,477,146                  | 2048 | 601,818                    |
| 2025 | 2,279,530                  | 2037 | 1,404,202                  | 2049 | 528,874                    |
| 2026 | 2,206,586                  | 2038 | 1,331,258                  |      |                            |
| 2027 | 2,133,642                  | 2039 | 1,258,314                  |      |                            |

- b. Demonstration of Compliance. In order to demonstrate compliance with the Facility-Wide CO<sub>2e</sub> Cap in each calendar year, the Facility may achieve the CO<sub>2e</sub> Cap by:
  - (i) controlling operations at the Facility to limit Actual CO<sub>2e</sub> Emissions to a level at or below the applicable year’s CO<sub>2e</sub> Cap, and/or
  - (ii) in the event that Actual CO<sub>2e</sub> Emissions exceed the applicable CO<sub>2e</sub> Cap, the Facility may demonstrate compliance by retiring offsets, as set forth in section c., below, to offset the amount by which the Actual CO<sub>2e</sub> Emissions exceed the CO<sub>2e</sub> Cap.

- c. **Offsets.** For purposes of demonstrating compliance with the CO<sub>2e</sub> Cap, as set forth in Section 1.b.(ii), above, allowances will be created to be used as offsets as follows:
- (i) **CO<sub>2e</sub> Operating Offsets :** In any calendar year in which the Facility’s actual annual facility-wide emissions of CO<sub>2e</sub> (“Actual CO<sub>2e</sub> Emissions”) are less than the Facility’s CO<sub>2e</sub> Cap, the difference (in tpy) between Actual CO<sub>2e</sub> Emissions and the CO<sub>2e</sub> Cap for such calendar year shall be deemed offsets at the following rates:
    - a. For CO<sub>2e</sub> Operating Offsets created from 2016–2021: Offset = 90%
    - b. For CO<sub>2e</sub> Operating Offsets created from 2022–2026: Offset = 80%
    - c. For CO<sub>2e</sub> Operating Offsets created from 2027–2031: Offset = 70%
    - d. For CO<sub>2e</sub> Operating Offsets created from 2032–2036: Offset = 60%
    - e. For CO<sub>2e</sub> Operating Offsets created from 2037–2046: Offset = 50%
    - f. CO<sub>2e</sub> Operating Offsets may not be created after 2046.
  - (ii) **RGGI Offsets:** Actual Regional Greenhouse Gas Initiative (RGGI)<sup>1</sup> CO<sub>2</sub> or CO<sub>2e</sub> credits or allowances (“Actual RGGI Allowance”) may be used to offset Actual CO<sub>2e</sub> Emissions calculated as follows: Offset = Actual RGGI Allowance x (price paid per ton/ \$30<sup>2</sup>), but at no greater than a ton for ton basis.
  - (iii) **Other Offsets:** The Facility may also procure offsets by purchasing Class 1 Massachusetts Renewable Energy Certificates, investing in Massachusetts RPS-eligible, local renewable generation projects or energy efficiency and demand response projects that supply capacity to the NEMA/Boston area, or other methods that are approved by CLF as real, permanent, verifiable, surplus offsets of GHG emissions in Massachusetts or in connection with electricity supplied to Massachusetts customers. Any offsets created in accordance with this provision shall be calculated as follows:
    - a. Massachusetts Class I REC Offset: 1 Massachusetts Class I REC = Offset equivalent to the marginal CO<sub>2</sub> emission rate for all units in New England as reported in the ISO-NE Electric Generator Air Emissions Report for the year in which the REC was purchased.
    - b. Investment in Massachusetts Class I RPS-eligible, local renewable generation, energy efficiency or demand response measures that supply capacity to the NEMA/Boston area: 1 MWh of wind, solar, EE or DR = Offset equivalent to the marginal CO<sub>2</sub> emission rate for all units in New England as reported in the ISO-NE Electric Generator

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<sup>1</sup> Or any similar mandatory program applicable to the Facility that replaces or supplements RGGI.  
<sup>2</sup> Annually adjusted based on any increase in the Consumer Price Index commencing in 2017.

Air Emissions Report for the year in which the project first begins generating/reducing energy.

d. **Monitoring and Reporting Requirements:** Within 60 days after the end of each calendar year covered under this agreement, Footprint Power shall provide CLF with documentation demonstrating compliance with the CO<sub>2e</sub> emissions limitations included in this agreement. Documentation of facility-wide emissions may be in the form of reports accepted by EPA in compliance with Title V, or such other form as mutually agreed upon by the Parties. Separate documentation shall be provided to the extent that compliance is achieved through the use of offsets. Documentation regarding offsets shall include proof of the purchase of RGGI offsets, Massachusetts Class I RECs, investment in Massachusetts Class I RPS-eligible local renewable generation, energy efficiency or demand response measures, or, in the case of any other CLF-approved offset, documentation that is mutually agreed upon by the Parties.

**2. Final shut-down and decommissioning:**

The parties agree that, provided that CLF fully complies with the terms of this Agreement, the Facility shall cease commercial operations no later than January 1, 2050, unless otherwise required by law and shall be fully decommissioned within two calendar years of shutdown.

**3. Expiration of Conditions.**

Notwithstanding anything in the foregoing to the contrary, the parties agree that the provisions of Paragraph 1 above shall no longer apply and be of no further force or effect in the event that either:

- a. MassDEP promulgates and implements new regulations, pursuant to the GWSA, which establish declining annual aggregate emissions limits consistent with the GWSA's requirements to reduce Massachusetts greenhouse gas emissions at least 25% below 1990 levels by 2020 and at least 80% below 1990 levels by 2050, provided that such new regulations are binding on new and existing power plants (including Salem Harbor Station) in Massachusetts until the ends of their operational lives; or
- b. the Federal government adopts and implements regulations restricting GHG emissions nationally to levels commensurate with those provided in the GWSA (i.e., no less stringent than 80% reduction from 1990 level by 2050);

**4. Siting Board Proceedings:**

The Parties agree jointly to file this Agreement with the Siting Board, during the comment period on the Tentative Decision requesting that the Siting Board append this Agreement to its final decision in the Certificate Case and require compliance with this Agreement as an enforceable condition of its approval of the Certificate.

**5. Air Permits**

Concurrent with filing its application for Title V Operating Permit for the Facility, Footprint Power shall submit an application for minor permit modification to MassDEP to incorporate the terms of this Agreement into the Facility's Comprehensive Plan Approval. In addition, Footprint Power shall include this Agreement as an appendix to its application for a Title V Operating Permit for the Facility and shall request that MassDEP include the terms of this Agreement in the Title V Operating Permit as part of the federally enforceable emission limitations for the facility.

**6. Withdrawal of Appeals and Pleadings.**

CLF agrees to voluntarily dismiss its pending Appeals, including, as follows: \_

- (a) CLF agrees, within 5 business days of the approval of the Siting Board pursuant to paragraph 4 above, to file to voluntarily dismiss with prejudice the EFSB Appeal and that it will not file or support any future appeals of the EFSB Final Decision or any final decision that complies with Paragraph 4 above or the underlying permits contained therein; provided that Footprint Power fully complies with the terms of this Agreement. Notwithstanding the foregoing, CLF will not be barred from enforcing the terms of this Agreement nor does this Agreement in any way bar CLF from challenging any new application before the Siting Board;
- (b) CLF agrees, within 5 business days of the approval of the Siting Board pursuant to paragraph 4 above, to withdraw its motion for intervention in the Air Permitting Proceeding and to withdraw as Authorized Representative for the ten persons group;
- (c) CLF agrees that it will not file or support any appeals of the Comprehensive Plan Approval that was issued for the facility on January 30, 2014 provided that Footprint Power fully complies with the terms of this Agreement. Notwithstanding the foregoing, CLF will not be barred from enforcing the terms of this Agreement nor does this Agreement in any way bar CLF from challenging any future applications to modify or enforce the terms of the CPA Approval (except in accordance with this Agreement or that do not increase emission levels) or any applications for new air permits for sources at this site;
- (d) CLF agrees that it will not file or support any appeal of or other challenge or objection to the PSD Approval that was issued for the facility on January 30, 2014 provided that Footprint Power fully complies with the terms of this agreement. Notwithstanding the foregoing, nothing in this Agreement shall be construed to act as a bar to CLF challenging the authority of MassDEP to issue PSD permits pursuant to the existing Delegation Agreement with respect to any facility other than the Facility, nor does this Agreement represent an admission by CLF that such Delegation Agreement is authorized under Massachusetts or federal law;

- (e) CLF agrees that it will, within 5 business days of the approval of the Siting Board pursuant to paragraph 4 above, file to voluntarily dismiss without prejudice the action for declaratory judgment that it filed in Massachusetts Superior Court on behalf of CLF and a ten residents group on January 14, 2014, captioned as *CLF et al. v. Massachusetts Department of Environmental Protection*, Civil Docket #SUCV2014-00161-H. Notwithstanding the foregoing, nothing in this Agreement shall be construed to act as a bar to CLF challenging the authority of MADEP to issue PSD permits pursuant to the existing Delegation Agreement with respect to any facility other than the Facility, nor does this Agreement represent an admission by CLF that such Delegation Agreement is authorized under Massachusetts or federal law;
- (f) CLF agrees that it will, within 5 business days of the approval of the Siting Board pursuant to paragraph 4 above, file to voluntarily dismiss its appeal of the c. 91 variance/written determination issued by the Massachusetts Department of Environmental Protection on November 1, 2013 and will withdraw as the authorized representative for the ten residents group. Notwithstanding the foregoing, nothing in this Agreement shall have any precedential effect with respect to the authority of the Massachusetts Department of Environmental Protection to issue variances for non-water dependent electric generating facilities nor will it serve as an admission by CLF that the Siting Board has the authority to incorporate such decisions into a Certificate thereby terminating the administrative appeal process, nor shall it be construed to act as a bar to CLF challenging the authority of the Massachusetts Department of Environmental Protection to issue a variance for a non-water dependent electric generating facility other than the Facility or the authority of the Siting Board to incorporate such a variance into a Certificate, nor does this Agreement represent an admission by CLF that such a variance is authorized under Massachusetts law;
- (g) Footprint Power will work with CLF to obtain sufficient environmental information from Algonquin Gas Transmission with respect to the gas lateral from the HubLine to the Facility to ensure that the construction methods will appropriately protect the environment and will demonstrate that the construction of the lateral will not serve to increase the capacity of Algonquin's system. Upon receipt of such satisfactory information so demonstrating, CLF agrees not to protest or appeal or otherwise delay any approval of such lateral.

## **7. Level Playing Field.**

It is the intention of the Parties that Footprint Power not be disadvantaged in the wholesale electricity market by agreeing to the foregoing terms. In addition, it is the intention of the parties that any subsequently permitted facility will be subjected to conditions at least as stringent as those set forth herein. Accordingly, if after five years of commercial operation of the Facility, Footprint Power reasonably believes that a power plant that received approvals from the EFSB and a MassDEP air permit, arising from applications filed on or after the date of this Agreement, is in any respect subject to materially less stringent requirements than those which are set forth in this

Agreement, Footprint Power may provide notice to CLF (including an explanation of the terms and conditions applicable to the subsequently approved power plant, and proposed modifications to the terms and conditions set forth herein), and may reopen these terms to seek agreement with CLF on conforming terms and conditions analogous to those applicable to the subsequently approved plant. The Parties will work cooperatively to identify proceedings before EFSB and MassDEP that may impact this provision with the intent that they will be in a position to submit public comments or intervene in the proceedings to advocate for terms consistent with this Agreement. Upon the approval of any applicable subsequent permits, CLF will negotiate in good faith to ensure analogous terms and will not oppose or unreasonably withhold consent to analogous terms.

**8. Effective Date.**

This Settlement Agreement is effective upon the Siting Board's adoption of the Agreement, without reservation, in its entirety as a condition of approving Footprint Power's Application for a Certificate.

**9. Additional Conditions.**

- (a) This Agreement establishes no principles, and shall not be deemed to foreclose any party from making any contention in any future proceeding or investigation, with respect to any issues raised in this proceeding except as to those issues and terms that are stated in this Agreement as being specifically resolved by approval and incorporation of this Agreement as a condition of the Certificate;
- (b) This Agreement shall not be deemed in any respect to constitute an admission by any party that any allegation or contention in this proceeding, or any fact relating to any other pending proceeding cited in this document, is true or false.
- (c) Except as specified in this Agreement to ensure compliance with the GWSA, the issuance of a Final Decision by the Siting Board incorporating this Agreement as a condition of the Certificate shall not in any respect constitute a determination by the Siting Board, by virtue of incorporation in this Agreement, as to the merits of any other issue raised in this proceeding or any proceeding cited in this document;
- (d) This Agreement is the product of settlement negotiations. The Parties agree that the content of those negotiations (including any workpapers or documents produced in connection with the negotiations) are confidential, that all offers of settlement are without prejudice to the position of any party or participant presenting such offer or participating in such discussion, and, except to enforce rights related to this Agreement or defend against claims made under this Agreement, that they will not use the content of those negotiations in any manner in these or other proceedings involving one or more of the parties to this Agreement, or otherwise;

- (e) The provisions of this Agreement are not severable. This Agreement is conditioned on its approval and incorporation into the Final Decision as a condition of the issuance of the Certificate by the Siting Board no later than March 3, 2014 (“Requested Approval Date”). The Parties agree that the Requested Approval Date of this Agreement may be extended upon the mutual consent of the Settling Parties and notification of such extension to the Siting Board;
- (f) If the Siting Board does not approve and incorporate this Agreement in its entirety by the Requested Approval Date, as may be extended by mutual Agreement of the Parties, this Agreement shall be null and void and this Agreement shall be deemed to be withdrawn and shall not constitute a part of the record in any proceeding or be used for any other purpose;
- (g) The Parties agree to bear their own costs, expenses and attorney fees associated with all proceedings referenced herein;
- (h) This Agreement shall constitute the complete and entire agreement and understanding between the Parties relating to the subject matter hereof, and all previous agreements, discussions, communications and correspondence with respect to the subject matter hereof shall be superseded by the execution and delivery of this Agreement. This Agreement may not be modified or amended except in a writing signed by or on behalf of the Parties hereto, or, if such modification or amendment affects less than all of the Parties hereto, signed by the affected ones of the Parties.
- (i) This Agreement shall be governed, interpreted and construed in accordance with the laws of the Commonwealth of Massachusetts, and, as applicable, the United States of America, the Massachusetts courts (including, as appropriate, the United States District Court for the District of Massachusetts) being the sole and exclusive jurisdiction for the determination of any future disputes relating hereto, arising hereunder or in connection herewith.
- (j) The undersigned represent and warrant that they have the right, capacity and all necessary authorization to execute this Agreement, and that the Agreement is binding upon the Parties their successors and assigns.
- (k) The Parties acknowledge that they have been represented with respect to this Agreement by legal counsel of their own choosing, that they have read this Agreement and have had it fully explained to them by counsel and are completely aware of its contents and legal effects, and agree that no presumption in the interpretation of this Agreement shall arise based upon the identity of the drafter of this Agreement or any of

its provisions. It is agreed and understood that this Agreement may be executed in multiple counterparts, each of which will be deemed to be an original and collectively shall constitute one Agreement.

- (1) Notwithstanding any foregoing provisions in this Agreement to the contrary, CLF and Footprint Power reserve their rights to enforce the Parties' obligations under this Agreement.

{Signature Page Follows }

EFSB 13-1

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their respective duly authorized representatives as of the Effective Date.

CONSERVATION LAW FOUNDATION

By: \_\_\_\_\_

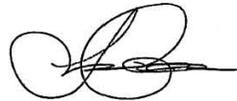
Sean Mahoney  
Executive Vice-President

FOOTPRINT POWER SALEM HARBOR  
DEVELOPMENT LP, by its General Partner,  
FOOTPRINT POWER SH DEVCO GP LLC

By: \_\_\_\_\_

Scott G. Silverstein  
President & COO

APPROVED by the Energy Facilities Siting Board at its meeting of February 20, 2014, by the members present and voting. Voting for approval of the Tentative Decision as amended: Steven Clarke, (Acting Energy Facilities Siting Board Chair/Designee for Richard Sullivan, Secretary, Executive Office of Energy and Environmental Affairs); Ann G. Berwick, Chair, Department of Public Utilities, Jolette A. Westbrook, Commissioner, Department of Public Utilities; Mark Sylvia (Commissioner, Department of Energy Resources); and Erica Kreuter (Designee for Secretary, Executive Office of Housing and Economic Development).



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Steven Clarke, Acting Chair  
Energy Facilities Siting Board

COMMONWEALTH OF MASSACHUSETTS  
Energy Facilities Siting Board

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In the Matter of Colonial Gas Company )  
d/b/a National Grid, Project Change Filing )

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EFSB 05-02A

FINAL DECISION  
ON SAGAMORE GAS PIPELINE AUGMENTATION  
PROJECT CHANGE FILING

Robert J. Shea  
Presiding Officer  
August 14, 2014

On the Decision:

John Young

APPEARANCES:

Lauren Peloquin, Esq.  
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National Grid USA Service Co, Inc.  
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LIST OF ABBREVIATIONS

|                          |  |
|--------------------------|--|
| Colonial                 | Colonial Gas Company d/b/a National Grid   |
| <u>Colonial Decision</u> | The final decision issued as <u>Colonial Gas Company</u> , 15 DOMSB 269 (2006)   |
| CCC                      | Cape Cod Commission  |
| Company                  | Colonial Gas Company d/b/a National Grid   |
| dBA                      | A-weighted decibels  |
| Department               | Department of Public Utilities   |
| DRI                      | Development of Regional Impact   |
| Eastern Segment          | The non-contiguous portion of the Project that would consist of approximately 1.6 miles of twelve-inch diameter pipe in Harwich  |
| EEA                      | Executive Office of Energy and Environmental Affairs   |
| Final Decision           | The final decision issued as <u>Colonial Gas Company</u> , 15 DOMSB 269 (2006)   |
| MAOP                     | Maximum Allowable Operating Pressure   |
| MEPA                     | Massachusetts Environmental Policy Act   |
| Middle Segment           | The non-contiguous portion of the Project that would consist of approximately 4.9 miles of twelve-inch diameter pipe in Yarmouth, Dennis, and Harwich                                |
| Notice                   | A Notice of Public Comment Hearing that was issued on May 29, 2013, and published in the Cape Cod Times and the Boston Globe on June 11 and June 18, 2013                            |
| Original Proceeding      | The proceeding begun by the filing of a Petition by Colonial Gas Company seeking permission to construct the Project. The Petition was approved by the Siting Board on May 17, 2006. |
| PCF                      | The Project Change Filing that commenced the instant proceeding  |
| Petition                 | The petition filed by the Company seeking to construct the Project.  |

|                                  |  |
|----------------------------------|--|
| Phases I and II                  | The portion of the Western Segment in Sandwich from Route 130 to Chase Road  |
| Pipeline                         | Phases I and II of the Western Segment which, in total, would consist of approximately 4.4 miles of 20-inch diameter gas pipeline located in Sandwich along Service Road.  |
| Project                          | Three new non-contiguous segments of natural gas pipeline, approximately 13.1 miles in combined length, to be constructed in the towns of Sandwich, Barnstable, Yarmouth, Dennis, and Harwich. The Project was approved by the Siting Board on May 17, 2006. |
| Project Change                   | The proposed realignment of Phase I and II of the Western Segment and the proposed use of hydrostatic pressure testing instead of pneumatic testing  |
| Project Change Filing (or "PCF") | Company's submission of the proposed Project Change to the Siting Board on October 9, 2012   |
| psig                             | Pounds per square inch gauge   |
| Representative Hunt              | State Representative Randy Hunt of Sandwich, an intervenor in the instant proceeding   |
| Siting Board (or "Board")        | The Massachusetts Energy Facilities Siting Board   |
| Town                             | The Town of Sandwich   |
| Western Segment                  | The non-contiguous portion of the Project that would consist of approximately 6.6 miles of 20-inch diameter pipe in Sandwich and Barnstable  |

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The Energy Facilities Siting Board (“Siting Board” or “Board”) hereby APPROVES, subject to the conditions set forth below, the project change (“Project Change”) proposed by Colonial Gas Company d/b/a National Grid (“Company” or “Colonial”).

I. SUMMARY OF APPROVED PROJECT AND PROJECT CHANGE REQUEST

A. Description of the Project as Approved by the Siting Board in 2006 and Current Status

On May 17, 2006, the Siting Board, acting pursuant to G.L. c. 164, § 69J, approved Colonial’s petition (“Petition”) to construct three new non-contiguous segments of natural gas pipeline approximately 13.1 miles in combined length in the towns of Sandwich, Barnstable, Yarmouth, Dennis, and Harwich (the “Project”). Colonial Gas Company, 15 DOMSB 269, 276 (2006) (“Colonial Decision” or “Final Decision”).<sup>1</sup> The three new pipeline segments were designed to augment the Company’s existing Sagamore Line, a 42-mile distribution pipeline located on Cape Cod. Colonial Decision at 276. The three segments were referred to as the Western Segment, the Middle Segment, and the Eastern Segment. Id. at 276-278. The Western Segment would consist of approximately 6.6 miles of 20-inch diameter pipe in Sandwich and Barnstable. The Middle Segment would consist of approximately 4.9 miles of twelve-inch diameter pipe in Yarmouth, Dennis, and Harwich. The Eastern Segment would consist of approximately 1.6 miles of twelve-inch diameter pipe in Harwich.

Colonial has further subdivided the Western Segment of the Project into three contiguous segments designated, west to east, as Phases I, II, and III. The Project Change would affect only Phases I and II of the Western Segment which, in total, would consist of approximately 4.4 miles of 20-inch diameter gas pipe located in Sandwich (“Pipeline”). Phase I (approximately 11,000 feet in length) would originate at the Algonquin Gas Transmission (“Algonquin”) take station in Sandwich (located approximately 190 feet west of Route 130) and continue eastward along Service Road to a tie in at the existing Sagamore Line at Quaker Meetinghouse Road in Sandwich where Phase II (an additional 12,000 feet) would begin and continue along Service

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<sup>1</sup> The Siting Board proceeding in which the Colonial Decision was issued, EFSB 05-2, is referred to here as the “Original Proceeding.”

Road to another tie in with the existing Sagamore Line at Chase Road in Sandwich (Exh. NG-1, at 6).<sup>2</sup>

Construction of the Middle Segment has been completed and is currently operational. The Company indicated that following construction of Phases I and II of the Western Segment, Phase III of the Western Segment and the entirety of the Eastern Segment will be permitted and constructed as demand warrants (id. at 1).

#### B. Description of the Project Change Proposal

Pursuant to the Project Change, Colonial seeks to modify the Project in two key respects: (1) re-align the Pipeline route, moving the approved Pipeline location approximately 15 feet northward; and (2) change the method of testing the Pipeline from air pressure testing to water pressure testing to facilitate a potential future increase in the Maximum Allowable Operating Pressure (“MAOP”) from 270 pounds per square inch gauge (“psig”) to 575 psig (Exh. NG-1, at 1).

##### 1. Realignment of the Pipeline Route

As originally approved, the Pipeline would be located along the northern paved edge of Service Road (Exh. NG-1, at 1). Pursuant to the Project Change, the Company seeks permission to move the Pipeline route approximately 15 feet northward, into the unpaved and largely wooded buffer area of the 100-foot-wide Service Road layout, just south of the fence marking the edge of the layout for Route 6 (id. at 1-6). Service Road is a two-lane roadway owned and maintained by the Town of Sandwich (“Town”) that lies parallel to, and directly south of U.S. Route 6, with a layout that is contiguous to the U.S. Route 6 layout (id. at 4-5, and at Figures 2, 5). The Company is proposing the Project Change in response to concerns expressed by the director of the Sandwich Department of Public Works (“DPW”) (who also is the Town Engineer), the director of the Sandwich Planning and Development Department (“Planning”), and the superintendent of the Sandwich Water District (id. at 4, and Appendix C). These Town

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<sup>2</sup> Phase III, which is not at issue in this proceeding, would commence at the tie in at Chase Road and would continue into Barnstable and end at a point where an existing NSTAR right-of-way crosses Service Road just west of Route 149. Completion of Phase III would also complete the Western Segment.

officials requested the Pipeline realignment given the existing density of utilities within Service Road and their concerns regarding the Town's ability to protect and maintain existing utilities as well as construct additional utilities the Town is considering for the future, including a new water line and a new sewer line (id. at 4-6).<sup>3</sup>

The above-mentioned Town officials requested the realignment of the Pipeline route based on the following objectives: (1) ensuring the safety of the public and utility workers; (2) avoiding possible damage to or disruption of existing water supply and fire hydrant lines; and (3) reducing costs to the Town for installation, maintenance, and repair of its present and future utility and roadway infrastructure (id. at 5 and Appendix C). The DPW director asserted that the approved location would necessitate cutting the pavement to install the Pipeline and would not be allowed by the Town unless the road were in disrepair and/or scheduled for improvements (id. at Appendix C). The Planning director noted that the Project Change would further the Town's plan to build an off-road bicycle path as part of the Claire Saltonstall Bikeway (a Boston-to-Provincetown combined on-road and off-road route) (id.). The DPW director indicated that relocating the Pipeline alignment could provide a dual benefit by serving as a graded and cleared base that could be used for such an off-road bicycle path (id.).

In response to the request by the above-mentioned Town officials, the Company conducted engineering and environmental analyses of the requested realignment and determined that the realignment would be an improvement to the Company's originally proposed and approved Pipeline location (id. at 5). After completing its analyses, the Company decided to propose the requested realignment of the Pipeline route as part of the present Project Change Filing.

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<sup>3</sup> On portions of the north side of Service Road there is an existing 16-inch diameter water main and a fire hydrant line, located within a few feet of the approved Pipeline route (Exh. NG-1, at 5 and Appendix C); on the south side of Service Road there is an existing twelve-inch diameter gas pipeline (with a MAOP of 270 psig) and a six-inch diameter gas distribution main (id., Appendix A and E).

## 2. Change in Method of Testing the Pipeline

In the Final Decision, the Siting Board approved the Company's proposed pressure-test method of using air or nitrogen ("pneumatic testing"). In the Project Change, the Company proposes to pressure test the Pipeline using water ("hydrostatic testing"). Hydrostatic testing could qualify the Pipeline for operation at a MAOP of 575 psig rather than 270 psig as approved in the Final Decision.<sup>4</sup> Despite the proposed changes in the testing method and the potentially increased MAOP, the Company stated that the Pipeline design, materials and construction method would not require any changes (Exh. NG-1, at 11). The Company indicated that it does not have any forthcoming plans to actually operate the Pipeline at a pressure above the previously approved MAOP of 270 psig (*id.* at 1-2). However, the Company noted that the increased MAOP would allow for greater gas delivery capacity on its system, if needed in the future (*id.* at 11).

The Company stated that pre-operational hydrostatic pressure testing would preclude the need to test the line again to secure the higher MAOP in the future – which would otherwise require taking the Pipeline out of service for a period of time (*id.*). The Company noted that, if the Pipeline is qualified for a MAOP of 575 psig, then to effect the increase in operating pressure to 575 psig the Company would notify the Pipeline Engineering and Safety Division of the Department of Public Utilities (the "Department") and provide the Department with its plans for increasing the pressure in accordance with federal and Department regulations (RR-EFSB-9). The Company acknowledged that, with a successful pre-operational hydrostatic test and notice to the Department, it would not need to secure formal approval from the Department prior to increasing the operating pressure of the Pipeline (*id.*).

## II. PROCEDURAL HISTORY

### A. Project Approval in Original Proceeding: EFSB 05-2

Pursuant to G.L. c. 164, §69J, the Siting Board approved the petition of Colonial to construct the Project in the Final Decision.<sup>5</sup> The Final Decision approved construction through

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<sup>4</sup> In order to test the Pipeline to qualify for a MAOP of 575 psig, the line must be pressurized to 862 psig (Exh. NG-1, at 11).

<sup>5</sup> At the time of that decision, Colonial did business as KeySpan Energy Delivery New England (Colonial Decision at 276).

December 31, 2015. No appeal was taken from the Final Decision. After the Final Decision was issued, the General Court enacted statutes intended to stimulate job growth that extended the deadlines of many permits and approvals then in effect, including Siting Board approvals, for a period of four years beyond their original expiration date. Section 173 of Chapter 240 of the Acts of 2010; Sections 74 and 75 of Chapter 238 of the Acts of 2012. Consequently, the 2006 Siting Board approval of Project construction is effective through December 31, 2019.

B. The Filing of the Project Change and Related Events

In the fall of 2012, the Company filed notices or petitions relating to the proposed Project Change with three separate administrative agencies. On September 17, 2012, the Company submitted a Notice of Project Change regarding the revised route for the Pipeline to the Massachusetts Environmental Policy Act (“MEPA”) Office of the Executive Office of Energy and Environmental Affairs (“EEA”) (Exh. NG-1, at 2). On September 28, 2012, the Secretary of EEA issued a certificate finding that “the project change is insignificant and does not require the preparation of an Environmental Impact Report” (Exhs. NG-1, at Appendix B; NG-2, at 2-2, and Attachment H).

On October 9, 2012, the Company submitted the proposed Project Change (“Project Change Filing” or “PCF”), designated as EFSB 05-02A, to the Siting Board.

On October 15, 2012, the Company submitted a Development of Regional Impact (“DRI”) application to the Cape Cod Commission (“CCC”) for construction of the Pipeline (Exh. NG-2). The DRI application included the revised alignment and testing protocol as proposed in the PCF with the Siting Board (Exhs. NG-2, at 2-3 to 2-6; NG-14). The CCC held three public hearings in which the public had an opportunity to provide input (Exh. NG-17, at 3-4). The CCC issued a final decision on February 28, 2013, approving construction of the Pipeline, as described in the DRI (*id.*).<sup>6</sup> This DRI submission to the CCC was

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<sup>6</sup> The DRI application describes the proposal for testing the Pipeline so that it may be qualified to operate at a MAOP of 575 psig (Exh. NG-2, at 2-4 through 2-6). The testing procedure described in the DRI application is identical to the testing procedure described in the PCF (*id.*). However, the final decision of the CCC does not specifically address the testing process (Exh. NG-17).

the first detailed review of the Western Segment of the Project by the CCC.<sup>7</sup>

C. Public Hearing, Discovery, Evidentiary Hearing, Briefs

Following approval of the DRI by the CCC, a significant number of local residents and officials expressed concerns about the PCF and urged the Siting Board to get additional public input. On June 3, 2013, State Representative Randy Hunt of Sandwich submitted a petition opposing the installation of the Pipeline on the north side of Service Road that was signed by approximately 1,100 local residents (Late-Filed Motion of Representative Hunt to Intervene at 1). Numerous additional objections from Sandwich residents were submitted by mail and email, including a letter from the Town of Sandwich Board of Selectmen dated April 16, 2013 (Exh. EFSB-LT-1).<sup>8</sup> The Presiding Officer responded to the Selectmen's letter by correspondence dated May 17, 2013 (Exh. EFSB-LT-2).<sup>9</sup>

On May 29, 2013, the Siting Board issued a Notice of Public Comment Hearing ("Notice") for a public comment hearing at Sandwich High School on June 26, 2013.<sup>10</sup>

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<sup>7</sup> On March 17, 2006, KeySpan filed with the CCC an application seeking Master Plan approval of the entire 13.1 mile pipeline Project (including the Western Segment) and specific DRI approval for the first 12,000 feet of the pipeline in the Town of Yarmouth, referred to as Phase I of the Middle Segment. On August 10, 2006, the CCC denied both KeySpan's request for Master Plan approval of the entire 13.1-mile pipeline Project and its request for specific DRI approval of Phase I of the Middle Segment. In response, KeySpan filed an Application for a Certificate of Environmental Impact and Public Interest with the Siting Board on October 12, 2006, seeking an "override" regarding the CCC's denial of the Middle Segment, as well as other related local permits. On June 22, 2007, the Siting Board approved KeySpan's Certificate request in EFSB 06-1 that had the effect of granting DRI approval for construction Phase I of the Middle Segment.

<sup>8</sup> The letter expressed the Board of Selectmen's concern over safety issues raised by the construction of the Pipeline. The Selectmen requested that the Siting Board consider "alternative routes" (Exh. EFSB-LT-1).

<sup>9</sup> In his response, the Presiding Officer noted that the Pipeline route had already been approved in the Original Proceeding, and that no appeal had been taken from that decision (Exh. EFSB-LT-2, at 3). Therefore, the Company would retain the right to construct the Pipeline on the previously approved route if the Project Change were denied (*id.*).

<sup>10</sup> The Company published the Notice in both the *Cape Cod Times* and the *Boston Globe* and distributed the Notice to various Town offices and municipal locations; copies of the

Representative Hunt intervened as an additional party in the Project Change proceeding, joining the parties in the Original Proceeding: the Towns of Yarmouth and Dennis (jointly); and Andrew Collentro, a Sandwich resident. The limited participants remained from the Original Proceeding: NSTAR Electric & Gas Corporation d/b/a NSTAR Electric; Russell and Suzanne Detore of Attleboro; and Diane Pinto of West Dennis.

The Siting Board staff and Representative Hunt issued several rounds of information requests to the Company. Both the Company and Representative Hunt submitted pre-filed testimony. Siting Board staff held an evidentiary hearing on November 12, 2013, at which Representative Hunt and his witnesses were present and participated. The Company and Representative Hunt submitted their initial briefs on December 23, 2013, and their reply briefs on January 10, 2014.

On May 6, 2014, the Siting Board staff distributed the Issues Memorandum to all Siting Board members, all parties, and all limited participants. On May 13, 2014, the Company and Representative Hunt submitted comments on the Issues Memorandum. In its comments, the Company represented that it had agreed to a number of visual mitigation and safety measures in this proceeding in addition to the conditions imposed by the CCC in its decision (Colonial Comments at 8).

The Siting Board held a public meeting on May 15, 2014, at which Representative Hunt and counsel for the Company addressed the Board. The Board discussed the matters raised in the Issues Memorandum and by the parties (Transcript of May 15, 2014, Public Meeting at 1-115). The Board directed the staff to prepare a tentative decision approving the Project Change with conditions (*id.* at 112, 115).

### III. SCOPE OF REVIEW

#### A. Standard of Review for a Project Change

When presented with a project change filing, the Board has previously stated that it will not inquire further about the proposed change if the change does not appear to alter in any

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Notice were also served by first class mail to owners of all property abutting the Pipeline ROW and to owners of land directly opposite on any public or private street as well as to abutters to the abutters within 300 feet of the edge of the ROW. The Company produced a return of service at the Public Comment Hearing attesting to the publication and service of Notice (Public Comment Hearing Tr. at 15).

substantive way either the assumptions or conclusions reached in the Board's underlying decision. Cape Wind Project Change, 16 DOMSB 194, 202 (2008) citing Berkshire Power Decision on Compliance, 7 DOMSB 423, 437 (1997); see also Fore River Project Change, 15 DOMSB 403, 409 (2006). In this case, the Board has chosen to conduct further inquiry, including: a public hearing and receipt of written public comments; additional opportunities for intervention; extensive discovery and the presentation of intervenor testimony; an evidentiary hearing; and initial and reply briefs. These steps have established a substantial record upon which the Board can apply its standard of review for a project change, described below.

Where the Siting Board determines that further inquiry is warranted, as in this case, the Siting Board focuses the additional inquiry on the issues raised by the proposed project change. Ruling on Intervenors' Request that Brockton Power's Project Change Filing be Treated as a New Petition, EFSB 07-7A/D.P.U. 07-58/07-59, at 12 (July 16, 2010); IDC Bellingham – Compliance, 11 DOMSB at 38-39 (noting that “expand[ing] the scope of review to matters other than the changes to the proposed facility presented in the [filing] would raise administrative efficiency concerns and could result in the relitigation of issues decided in the underlying case”). Where the Siting Board conducts further inquiry regarding a project change filing, the Siting Board's standard of review is grounded in and consistent with its broad statutory mandate to ensure a reliable supply of energy, with a minimum impact on the environment, and at the lowest possible cost – while according due recognition to its prior review and findings. See Box Pond Association v. Energy Facilities Siting Bd., 435 Mass, 408, 419 (2001).

#### B. Case Law on the Reconsideration of Previous Decisions

One of the issues disputed by the parties – described in more detail below – is whether the Siting Board, occasioned by the Project Change, should, in effect, reconsider the conclusion reached in the Final Decision that the Service Road route is superior to the alternative routes evaluated in the Original Proceeding. Pursuant to applicable statutes, parties to a final decision of the Siting Board may take an appeal from that decision directly to the Supreme Judicial Court. G.L. c. 25, § 5, and c. 164, § 69P. No appeal was submitted regarding the Final Decision.

The failure of a party to take an appeal, however, does not permanently preclude the Board from reexamining a particular conclusion it has reached. The Supreme Judicial Court has held that administrative agencies, such as the Board, have the power to reconsider previous

decisions. Stowe v. Bologna, 32 Mass.App.Ct. 612, 615 (1992) (citations omitted) aff'd 415 Mass. 20 (1993) (“In the absence of express or perceived statutory limitations, administrative agencies have an inherent authority to reconsider their decisions”). This power, however, must be “sparingly used” so that administrative decisions retain the “resolving force on which persons can rely.” Id. at 616. In support of its holding, the Stowe court noted that while an administrative decision has an adjudicatory component, it also frequently has a regulatory component that “may warrant reexamination in the light of changes in regulation, purpose, later decisional law, or applicable on-the-ground facts.” Id.

Potential reconsideration of the route selection is addressed in Sections IV.A.2 and 3, Section IV.B, and Section IV.C.2, below.

#### IV. REALIGNMENT OF THE PIPELINE ROUTE

##### A. Description

The Company’s PCF evaluated a range of issues relating to the proposed Pipeline realignment including: safety considerations, environmental impacts, construction methods, and cost. During the course of the proceeding, Representative Hunt and Siting Board staff asked additional questions about an alternative route that used both NSTAR’s right-of-way (“ROW”) and Route 130 (Exhs. EFSB-10; RHDC-03). This alternative route (“NSTAR ROW”) was evaluated previously in the Original Proceeding, but it was neither selected by the Company nor found by the Siting Board to be the preferred route. Colonial Decision at 311-315, 349.

##### 1. Relocation Off Service Road

The Company stated that it would need to clear a ten- to 15-foot-wide strip of the Service Road layout from the existing 70- to 120-foot-wide wooded buffer area between the north side of Service Road and south side of Route 6 (Exh. NG-1, at 7-8). The land surface would be re-graded as needed, a trench dug, the Pipeline assembled and covered with fill, and the land re-seeded (id. at 7). The Company indicated that the construction methods for the Project Change would be similar to those of the originally approved Pipeline, although the off-road location would allow for longer sections of pipe to be used (id. at 10). The Company proposes to maintain the approved construction hours and related procedures included in the Final Decision (Exh. EFSB-7).

The PCF describes the proposed Pipeline location generally as 15 feet north of Service Road (Exh. NG-1, at 6). The Company subsequently indicated that, depending on the slope of the road's embankments in some places, it might be necessary to locate the Pipeline more than 15 feet north of Service Road or, alternatively, to place the Pipeline within the paved edge of the road to avoid construction difficulties (Exhs. EFSB-6; EFSB-14; EFSB-15; EFSB-19(1)). Due to the slope conditions, the Company indicated that the Pipeline would likely cross onto and off pavement several times.<sup>11</sup> The Company pledged to make every reasonable effort to stay off pavement, but stated that it would restore any roadway work areas with an application of asphalt for the full width of the road (Exh. EFSB-6).

Colonial stated that soil in the Service Road area is generally a mix of sand and gravel (Exh. EFSB-3). Due to the relative inability of sand to hold a steep slope, Colonial stated that finished slopes adjacent to the Pipeline must be less than 1:3 (that is, a rise of one foot for every three feet in length – or a maximum 33 percent grade) (*id.*). The Company intends to reduce the steep grades by cutting and filling, as needed, and the construction will also employ standard soil stabilization techniques (Exh. EFSB-18). In areas where less than three feet of cover can be maintained, the Company stated that the Pipeline will be protected with a concrete cap or a steel plate barrier installed above the pipe (Exh. EFSB-3).

Where in-road construction may still be needed with the Project Change, the Company indicated that the Pipeline would be located at least ten feet away from the existing water main (Exhs. EFSB-19; EFSB-21). The Company agreed to submit its plans to protect the Sandwich Water District mains to the district superintendent prior to starting work (Exh. EFSB-10, at 4).

## 2. Alternative Route Using NSTAR ROW

In the Original Proceeding, the Siting Board approved the Company's route along Service Road ("Primary Route") after considering the merits of a number of routing alternatives, including the NSTAR ROW route. Colonial Decision at 311-315, 325-330, 336-349. From the Algonquin take station at the intersection of Route 130 and Service Road in Sandwich, the NSTAR ROW route runs southerly along the side of Route 130 approximately one mile, then

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<sup>11</sup> The Company assumed there would be eleven such instances in its estimate of the cost of providing mitigation measures (Exh. RHDC-01; RR-EFSB-7).

easterly on the NSTAR multi-circuit transmission ROW to its intersection with Service Road just to the west of the Route 6/Route 149 interchange. Id. at 309.

The Siting Board concluded that the Primary Route along Service Road would be preferable to the NSTAR ROW alternative route with respect to impacts relating to wetlands, water resources, land use and land resources, and comparable with respect to noise and traffic impacts. Overall, the Siting Board found the Primary Route to be preferable to the NSTAR ROW route with respect to environmental impacts. Colonial Decision at 347. The Siting Board found that the Primary Route would cost approximately \$1,000,000 less than the NSTAR ROW route and that the Primary Route would be slightly more reliable than the NSTAR ROW route, given the greater certainty with which the segment could be approved and constructed. Id. at 348-349. Ultimately, the Siting Board concluded “the Western Segment primary route would be superior to the alternative route with respect to providing a reliable energy supply to the Commonwealth with a minimum impact on the environment at the lowest possible cost.” Id. at 349.

3. Safety of Project Change Route Compared to the Approved Route on Service Road

The Company contends that the record in this proceeding establishes that the Pipeline is incrementally safer with the Project Change than the approved Service Road route (see Exhs. NG-1, at Section 3.5; EFSB-10; EFSB-11; EFSB-24; EFSB-25; EFSB-26; RHDC-29; RHDC-32; RR-EFSB-3; RR-EFSB-5; RR-RH-2). The Company noted that inadvertent “dig ins” are the principal cause of pipeline accidents across the country and that the Project Change would further reduce the risk of dig ins by keeping the Pipeline farther away from other road and utility work activities (Tr. at 49). The Project Change would also locate the Pipeline approximately 15 feet farther away from the residences on the south side of Service Road, providing somewhat greater distance than the approved route in the event of a pipeline incident.

Colonial stated that the overall safety of any pipeline is established by the safety of the design, the proper specification and fabrication of the pipe, its proper installation, the performance of necessary tests as installation is completed, and an ongoing program of testing and maintenance (id.). The Company described a number of features in the Project Change that are intended to ensure safety, including: pipeline design, operation, and maintenance in

accordance with state and federal regulations; high quality new steel pipe; factory coating for corrosion protection; use of certified welders; radiography of all welds; cathodic protection; use of at least three feet of cover over the pipe; visible markers conforming to U.S. Department of Transportation requirements; hydrostatic testing to almost three times the initial MAOP; monitoring by a computerized system of supervisory control and data acquisition (“SCADA”); an annual leak survey by vehicle; and internal inspection of the pipe with automated devices known as “pigs” (Exh. EFSB-10, at 12-13).

Colonial acknowledged that, in general, pavement would better distribute the weight of vehicles passing over a pipeline than would a pipeline covered only by soil. However, with the Project Change, the Pipeline would be located where vehicle travel normally does not occur on Service Road. Colonial stated that soil in the Service Road area is a sandy loam, capable of supporting a truck with a rating of 32,000 pounds per axle above the proposed Pipeline (with the anticipated MAOP of 270 psig) provided that at least three feet of soil cover the Pipeline (RR-EFSB-1; RR-EFSB-7). To provide extra protection for the Pipeline with the Project Change, the Company indicated that it would install cathodically protected steel plates where the Pipeline crosses the paved edge of Service Road (RR-EFSB-7).<sup>12</sup> This would provide added protection for the Pipeline in the event that a heavy truck were to drive off Service Road pavement directly above the point where the Pipeline crosses under the pavement (*id.*). The Company stated that the disadvantages of such plates would be their potential interference with future road paving work, and also the cost, which would be approximately \$48,400 assuming a total of eleven cross-over locations (*id.*).

The Company noted that some safety features and measures are common to both Service Road routes. For example, the Company referenced its emergency response planning and its Emergency Response Plan (“ERP”) (submitted annually for review and approval to the Department) in ensuring safety of the Pipeline (Exh. RHKL-1). The Company’s ERP covers a range of circumstances (*e.g.*, gas leaks, fires, explosions, etc.) for which an emergency response

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<sup>12</sup> At a minimum, the Pipeline would need to cross Service Road in two locations to tie in to the Company’s existing Sagamore Line. Depending on the slope and soil conditions of the layout beyond the unpaved north shoulder of Service Road, the Company indicated that the final design of the Pipeline (to be developed in consultation with the chosen contractor) might require the Pipeline to remain under the pavement in additional locations (Exhs. EFSB-14; EFSB-15; EFSB-18).

may be necessary (*id.*). In connection with its ERP, the Company provides ongoing emergency, operating, and maintenance training to Company personnel. The Company stated that it would provide training to the Sandwich Fire Department and any other interested Town officials that would focus on communication and incident response relating to the Pipeline (Exh. EFSB-10(d)). The training would also involve a simulated incident to help prepare first responders for a variety of potential emergency scenarios, including matters of egress for abutters, access for Company personnel during heavy traffic conditions, and other scenarios identified by Representative Hunt and area residents.

#### 4. Safety of Project Change Route Compared to the NSTAR ROW Route

In comparing the Service Road routes to the NSTAR ROW alternative route with regard to safety, Colonial indicated that the Pipeline would be safe in either location (Exh. EFSB-10). However, Colonial pointed out several factors where the safety profile of the two routes would differ in the event of a Pipeline break and fire. The Company stated that the response time along the NSTAR ROW would be delayed because the NSTAR high voltage lines serving the area most likely would need to be taken out of service before emergency vehicles could use water for firefighting (*id.* at 6). In addition, the Company noted that depending on the terrain and time of year, accessing and traveling along an electric transmission right of way could be more challenging for multiple emergency vehicles (*id.*).

Furthermore, the Company noted that the NSTAR ROW route has a sizeable residential area abutting its south side and that the homes are located relatively close to the edge of the ROW (*id.* at 6; Tr. at 52).<sup>13</sup> The Company indicated that the proximity of the homes to the NSTAR ROW route would increase the potential for dig ins relative to the Service Road route, which has no developable land and no nearby homes on the north side of the street for Phases I and II (Tr. at 51-53). In addition, the portion of the NSTAR ROW route along Route 130 in

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<sup>13</sup> To evaluate the density of residential development near a pipeline, a factor in assessing risk, the Company compared the number of residences within 300 feet of potential alignments. There are 82 homes within that distance of the NSTAR ROW route and 68 homes along the Service Road route. The Company characterized these numbers as similar and both representative of a relatively low residential density (Tr. at 57-59).

Sandwich is an area with commercial development that is also subject to concerns about third party dig ins (Tr. at 52).<sup>14</sup>

Conversely, the NSTAR ROW may be advantageous relative to Service Road with respect to access and egress safety issues. There are 28 homes located directly on Service Road and 69 homes with single-street access to Service Road (Exh. EFSB-10(b) at 3). In the event of a Pipeline fire near the point of intersection of such access with Service Road, egress by road would likely be delayed until the fire is extinguished. In contrast, the egress routes for residential areas along the NSTAR ROW do not cross or approach the NSTAR ROW route (Exhs. EFSB-10(b); RH-1, at 4).

#### 5. Environmental Impacts

With regard to land use and visual impacts, the Project Change would require a total of approximately five acres of vegetation removal (including scrub oak, pitch pine, and various understory species) within a ten- to 15-foot wide strip along its 4.4-mile length; after construction, the area would be rough graded, stabilized, and reseeded with a field mix (Exh. NG-1, at 6-7). With the Project Change, some residents along Service Road would experience a reduction of visual buffer from Route 6, and Colonial will offer screening plantings at no cost to the residents directly along Service Road between Route 130 and Chase Road (Exh. EFSB-8). The plantings would typically be native cedar and/or pine, and would usually be planted on the homeowner's property (Exh. EFSB-8). The Company filed details of this plan with the CCC on January 15, 2013 (Exh. EFSB-9(S2) at 1, att. E). The Company indicated that planting trees for visual buffer along the north side of Service Road would be problematic

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<sup>14</sup> Additional difficulties cited by the Company with respect to using the NSTAR ROW include: (1) the requirement for legislative approval of the route, associated with its location partly on lands protected by Article 97; (2) a need for consent from NSTAR; (3) a need to obtain an easement for such construction from at least 58 of the approximately 71 property owners along the route; and (4) the increased difficulty in tying the new segments back to the existing Sagamore Pipeline (Exh. RHDC-03). Colonial Decision at 314-315. The Company noted the potential for delay resulting from these factors. In addition, the Company stated that it would need to design the Pipeline in a way to minimize the adverse effect of induced current from the power lines on the Pipeline's cathodic protection system (Exhs. RHDC-02; Tr. 59-64, 100-110; RR-EFSB-6).

because roots near the Pipeline and near the municipal water lines are undesirable, as are tree branches near the existing overhead utility lines (Exh. RHDC-27).

The proposed change in Pipeline construction method would also lead to some changes in related construction noise along Service Road (Exh. EFSB-7). First, power equipment would be used to clear trees at the start of the job, potentially including chain saws, feller bunchers (mechanical tree harvesters), trucks, and wood chippers (id.). Second, there would be a reduced need for pavement saws or vehicles used for pavement removal (id.). Colonial stated that the bulk of the work, including trenching, pipe placement, welding, and backfilling, would generate a similar amount of noise whether the Pipeline were located underneath Service Road or approximately 15 feet to the north (id.). The Company noted that it did not receive any noise complaints relating to the 4.9 miles of construction along the Middle Segment, where homes are typically closer to the street (id.).

According to the Company, existing vegetation between Route 6 and Service Road may provide as much as two A-weighted decibels (“dBA”) of attenuation of traffic noise, assuming that the woods are considered “dense” (Exh. RHDC-27). The modeling used by the Company indicates that removal of ten to 15 feet of vegetation would reduce the attenuation effect by about 0.2 to 0.3 dBA at sensitive receptor locations south of Service Road, which the Company characterized as an imperceptible difference (id.; Exh. EFSB-10(i)). The Company proposes to collect pre-construction and post-construction noise measurements, to be shared with the Town and interested abutters, to further substantiate its noise analysis (Exh. RHDC-27).

Colonial’s original plan to locate the Pipeline at the edge of Service Road would have necessitated the closure of one lane of traffic during typical construction work and the closure of both lanes of traffic for certain activities (Exh. NG-1, at 9). With the Project Change, the Company indicated that traffic flow would be maintained at all times in the eastbound lane, and that westbound lane closures would be far less frequent, with less resulting traffic congestion (id.; Exh. EFSB-29). The Company proposes to work Monday through Friday but would like the flexibility to work on Saturdays as well, in order to meet its installation schedule (Exh. EFSB-22). The Company promises to develop a traffic management plan in consultation

with the Town and to submit the plan to the Siting Board in accordance with Condition A of the Original Decision (Exh. EFSB-29).<sup>15</sup>

The area north of Service Road is mapped Priority Habitat for eastern box turtle (a species of Special Concern) by the Natural Heritage and Endangered Species Program (“NHESP”) (Exhs. NG-1, at 7; EFSB-31). The Project Change location was reviewed with the NHESP and the prior turtle protection plan from the original Pipeline location was updated to include seasonal limits on clearing and pre-work “turtle sweeps” by trained personnel. NHESP informed the Company that with the updated turtle protection plan, the Project Change would not result in a “take” of eastern box turtle (Exh. EFSB-31; NG-12). The Certificate issued by the Secretary of EEA on the Project Change finds that no adverse impacts to this state-listed species are expected (Exh. NG-1, at app. A).

There appear to be no wetlands along the modified Pipeline route, and trench depths of six to seven feet are well above typical depths to groundwater (Exh. EFSB-31). To reduce the potential for long-term impacts to groundwater from accidental fuel spills, the Company agreed during the CCC review to fuel all equipment and perform necessary maintenance at a commercial fuel station or the contractor’s facility (id.).

A prior cultural resource sensitivity assessment conducted by the Company in 2006 determined that Service Road and its environs are categorized as a “low-sensitivity area” due to the prior disturbance of the area during construction of Route 6 and Service Road (Exh. NG-1, at 9). Therefore, the Company indicated that the Project Change, like the original design, would not adversely affect cultural resources (id.; Exh. EFSB-31).

#### 6. Project Change Cost

The Company estimated that the decreased need for pavement cutting, removal and restoration of the Project Change would more than offset the additional costs for vegetation removal, mitigation and earth work (Exh. NG-1, at 6). Based on bids already received, the

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<sup>15</sup> A modeling analysis performed by the Company indicated that the Pipeline would reduce the amount of liquefied natural gas (“LNG”) trucking (and the resulting traffic impacts) to the Company’s South Yarmouth LNG facility from off-Cape sources (Exhs. NG-1, at 12-13; NG-1, app. E, at 3).

Company stated that the Project Change would be approximately \$375,000 to \$450,000 less costly than the originally approved Pipeline (Exh. EFSB-34).

B. Positions of the Parties

1. Representative Hunt's Argument

Representative Hunt acknowledges Board precedent against re-litigating previously adjudicated issues, but he poses the following questions: “Isn’t it important to address issues as they arise whether they have administrative efficiency concerns or not? As situations and times change isn’t it important to do the right job?” (Hunt Reply Brief at 5). He further questions the Company’s assertion that that the Project Change Filing “is not a vehicle for the re-litigation of issues that have already been fully and fairly determined” (emphasis provided) (*id.* at 5-6). Representative Hunt asserts that “Everything should be ‘on the table,’ even the issue of which proposed path is the better option,” and that in his view, heretofore, the issues have “not been fully and fairly determined” (*id.* at 6).

Representative Hunt argues that the proposed Pipeline presents numerous critical issues that have not been adequately addressed by the Company. These issues include: the safety and means of egress for area residents during a potential Pipeline incident; Pipeline safety; threats to the Town Water District’s water main; fire protection adequacy; visual/noise impacts; traffic; cost; and various alleged procedural deficiencies. He cautions that approval of the Pipeline should not be granted until all such questions have been fully addressed and answered completely (Hunt Brief at 12). Ultimately, Representative Hunt concludes, “Service Road is not the best option for this proposal and that other locations need to be considered and evaluated...” (*id.*).

One of Representative Hunt’s primary concerns about the Pipeline is safety and, in particular, the limitations on egress for the residents who live on Service Road and on the various cul-de-sacs off Service Road (Exhs. EFSB-10(b); RH-1, at 4). There are 28 homes located directly on Service Road and 69 homes with single-street access to Service Road (Exh. EFSB-10(b) at 3). Representative Hunt argues that a Pipeline fire or explosion at or near the point of intersection of one of the single-street-access roads with Service Road would trap the residents (especially seniors, young children, and those with disabilities) in their subdivisions

(*id.*; Exh. RH-1, at 4; Hunt Brief at 2).<sup>16</sup> Representative Hunt raises similar concerns with respect to the clients residing at the Spaulding Rehabilitation Hospital and the Mary McCarthy Hospice House, both located on Service Road (Hunt Brief at 10). This situation is exacerbated by a lack of a water main and fire hydrants along an approximately two-mile length of Service Road (Hunt Reply Brief at 7; Exh. EFSB-10(f) at 6).

Representative Hunt notes that high-pressure gas pipelines can be dangerous, as demonstrated by tragic incidents in recent years in San Bruno, California, and Sissonville, West Virginia; and even locally on Whites Path in South Yarmouth where an incident in 1991 caused property damage, injuries and shut down Route 6 (Hunt Reply Brief at 14; RR-EFSB-8).<sup>17</sup> He contends that even with accepted safety practices “bad things can happen” (Hunt Brief at 9). Representative Hunt argues that the co-location of fire hydrants should be a required safety condition for allowing a high-pressure gas pipeline on Service Road (*id.*).

Representative Hunt alleges that, by failing to seek “input or permission from the Sandwich Board of Selectmen for placing the proposed pipeline within the Service Road layout,” the Company did not follow G.L. c. 164 §§ 70 and 70A (*id.* at 1). Representative Hunt acknowledges support for the Project Change by officials at the Sandwich Water District, the Planning Department, and the DPW, but he “question[s] the motives of a few local town officials

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<sup>16</sup> Representative Hunt calls attention to a November 2012 gas leak which, he asserts, happened on Service Road near Mill Street and in which, he contends, “property owners were not allowed to leave their homes and were trapped on Mill Street for a number of hours” (Hunt Brief at 7). The Hunt Brief does not cite to the record in support of this assertion (*id.*).

<sup>17</sup> According to the Company, on June 10, 1991, a contractor apparently working for the Town of Yarmouth was grading the roadway along the north shoulder of Whites Path in Yarmouth when the grading machine “scuffed into” (*i.e.*, punctured) the existing ten-inch steel, 200-psig gas main causing a leak (RR-EFSB-8). The Company crew responded to the incident at 10:30 a.m. (*id.*). The gas main ignited at 12:28 p.m., while two Company technicians were in the trench attempting repairs (*id.*). Both technicians were burned and were taken to the hospital with non-life-threatening injuries (*id.*). The gas main was shut down approximately one hour after ignition (*id.*). The ignition damaged an overhead electric line; the Yarmouth fire and police departments shut down Whites Path; and the Mass DOT shut down a portion of the eastbound lane of Route 6 (*id.*). Since this incident, the Company has implemented some new safety procedures to prevent injury to personnel working on high-pressure gas leaks (*id.*).

who have put the concerns of a bike path ahead of those issues and concerns of area residents” (Hunt Reply Brief at 1).

Representative Hunt notes that the Company still does not have a final design and has not yet selected a contractor even though it has been working on the Pipeline proposal for almost twelve years, making the Company’s Pipeline cost estimates unreliable in his view (*id.* at 8, 13). Representative Hunt argues that the NSTAR ROW route is not as costly or burdensome as characterized by the Company and that it should be evaluated more carefully before a potential Pipeline along Service Road – with or without the Project Change – is approved and built (*id.* at 5-6).<sup>18</sup>

Representative Hunt argues that that potential damage to the asbestos-cement water main along Service Road by construction of the Pipeline would have “an extremely negative health impact” (*id.* at 11). He observes that, notwithstanding this concern, slope conditions north of Service Road may necessitate retaining the Pipeline route close to or within Service Road in a few locations, potentially damaging the asbestos-cement water main despite the Company’s best intentions (Hunt Brief at 4).

With regard to the removal of trees and brush, Representative Hunt asserts that this would be “devastating to the character of the roadway, to the community, and to area residents” and would diminish property values (*id.* at 3; Hunt Reply Brief at 8). Representative Hunt dismisses the Company’s proposed visual mitigation measures as inadequate; he also criticizes the sound study performed by the Company, as the readings were taken only in the late fall and, he asserts, are not representative of conditions for different times of the year (Hunt Brief at 6).

Representative Hunt is concerned with traffic – whether the Pipeline is located under or north of Service Road (Hunt Reply Brief at 10). He asserts that the Company has not performed a traffic study to determine the effects of the Pipeline construction (Hunt Brief at 3-4). With a reduced vegetated visual buffer between Service Road and Route 6, Representative Hunt posits that motorists stuck in traffic on Route 6 would more easily see the opportunity to detour onto Service Road as a cut-through route (Hunt Reply Brief at 4). Representative Hunt also warns

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<sup>18</sup> Representative Hunt asserts: “Our understanding is that the EFSB never did reject the NSTAR right-of-way as the preferred pipeline route” (Hunt Brief at 10). In fact, in the Final Decision, the Siting Board found that the Service Road route was a superior route in comparison with the alternative routes evaluated, including the NSTAR ROW. See Colonial Decision at 349.

that potential Saturday work hours should not be allowed under any circumstances given the heavy traffic that occurs on summer weekends in the area (id. at 9).

## 2. The Company's Argument

The Company asserts that the Siting Board's precedent of not revisiting prior findings from earlier decisions is appropriate and should not be modified in this proceeding. The Company contends that the established review practice of the Siting Board in project change cases is sound as it effectively balances a number of objectives, including: (1) allowing the Siting Board and project proponents to retain as much finality as possible in final decisions; (2) avoiding the time and effort of duplicating the review of resolved matters; (3) allowing flexibility to make changes to projects as necessary while providing all parties with the opportunity to explore proposed changes and present evidence as required; and (4) ensuring that a given project, as changed, would contribute to a reliable supply of energy for consumers in Massachusetts at the lowest possible cost and with a minimum environmental impact. The Company also cites two Supreme Judicial Court cases involving the Siting Board as supporting the view that the final order of an administrative agency in an adjudicatory proceeding precludes relitigation of the same issues between the same parties. Company Brief at 10, citing Box Pond, 435 Mass. at 419; City Council of Agawam v. Energy Facilities Siting Bd., 437 Mass. 821, 829 (2002).

The Company asserts that Representative Hunt's arguments "do not rely on substantial evidence; instead, they base their concerns on conjecture, mischaracterizations of the Company's Project, and speculative theories" (Company Reply Brief at 3). The Company asserts that nowhere in Representative Hunt's Brief does he make a claim that the Project Change is an inferior proposal as compared to the Pipeline approved previously by the Siting Board (Company Reply Brief at 1-2). The Company views the majority of Representative Hunt's issues as relating to the Pipeline generally – not to the proposed Project Change – which it regards as the appropriate focus of this proceeding (Company Reply Brief at 1-2).

The Company argues that the record in this proceeding establishes that: (1) the Company would safely construct, operate and maintain the Pipeline in accordance with all applicable federal and state safety regulations; (2) the Pipeline does not present any unique or otherwise unprecedented safety considerations as compared to natural gas pipelines in other areas of the

Company's service territory; and (3) with the Project Change Filing, the Pipeline is incrementally safer than the approved Service Road route (see Exhs. NG-1, at Section 3.5; EFSB-10; EFSB-11; EFSB-24; EFSB-25; EFSB-26; RHDC-29; RHDC-32; RR-EFSB-3; RR-EFSB-5; RR-RH-2).

The Company avers that safety is of paramount importance and that the Company's track record is excellent. National Grid (the parent company of Colonial Gas) owns more than 4,000 gas main segments with a 20-inch or larger diameter throughout its Massachusetts service territory – including both urban and rural residential areas (Exhs. RHDC-29; Attachment RHDC-29; RR-EFSB-5). The Company notes that National Grid's Massachusetts distribution system includes a number of locations where: (1) there are three gas lines in a residential area on the same street (at least two of which are high-pressure lines) (Exh. RHPS-8); and (2) there are high-pressure gas distribution pipelines in residential areas where municipal water supply is not available for fire suppression purposes (RR-RH-2).

The Company does not dispute that the hypothetical incident scenarios contemplated by Representative Hunt are possible; rather, the Company contends that such scenarios are extremely unlikely events and that the Company takes great care to avoid and minimize such risks in full compliance with strict federal, state, and Company standards to which the Pipeline would be designed, constructed, operated and maintained (Company Reply Brief at 6). With regard to the pipeline incidents in San Bruno, California, and Sissonville, West Virginia, the Company asserts that it has provided detailed descriptions of those incidents, explained the lessons learned, and prepared an extensive list of precautions that would be taken by the Company to minimize the likelihood of similar events ever occurring on Service Road (Exh. EFSB-10(p), (q); Company Initial Brief at 13-14).

With respect to environmental impacts, the Company asserts that the Project Change would be comparable to, or better than, the originally approved Pipeline. The Company contends that any additional environmental impacts would be limited to the visual impacts from the clearing of vegetation and that such impacts would be minimized and mitigated by the Company's visual mitigation program (Exh. NG-1, at 7, 10).

The Company cites the record in the proceeding as establishing that noise impacts would be properly minimized. The strip of vegetation to be removed is a small portion of the typically 100-foot wide vegetated area between Service Road and Route 6 (Exh. EFSB-10(i)). The

Company asserts that noise levels decrease with distance and are also reduced by the blocking effects of intervening terrain, structures, and solid fencing (id.). The Company notes that there are wide variations in existing ambient noise levels over the course of a day and seasonally, and as a function of traffic levels and speed, road surface conditions, and weather conditions (id.). Although thick stands of trees can provide some attenuation of traffic noise from Route 6, the Company asserts that it is a decidedly second-order effect (Exh. EFSB-10, (i); Company Brief at 21). The Company asserts that its noise study establishes that the proposed removal of ten to 15 feet of trees would not cause a discernible change in noise levels at residences along the south side of Service Road (Exh. EFSB-10, (i); Company Brief at 21).

The Company indicates that the Project Change would decrease traffic impacts as compared to the approved location (Company Brief at 22). Furthermore, the Company would develop a comprehensive traffic management plan (“TMP”) to be used during construction with input from the Town and the Massachusetts Department of Transportation. The TMP will be submitted to the Siting Board in accordance with the Siting Board’s original approval of the Project in the Final Decision (Exhs. NG-1 at 10; EFSB-29). The Company also asserts that the Project would reduce the need for LNG trucking on Cape Cod, which would help reduce traffic (Exh. NG-1, at 12-13, and at Appendix E; Company Brief at 23).

The Company represents that it would use best construction practices for the Pipeline’s construction (Exh. EFSB-10(m); Company Brief at 23). The Company states that it has shown that it will take steps to minimize the risk of adverse impacts to existing utilities in Service Road during construction of the Pipeline. As an initial matter, the Company argues that it routinely performs work in close proximity to existing utilities and is experienced in implementing measures to protect those utilities (Exh. EFSB-10(c)). The Company’s gas distribution line installation and maintenance projects in urban areas typically involve work in the vicinity of cement or asbestos-cement water mains, sewer mains, and storm-water systems; thus, the Company believes its engineers and contractors possess all the necessary experience to deal with such issues (id.)

In response to Representative Hunt’s assertion that Company has not followed G.L. c. 164, § 70, the Company argues that his concerns are “premature and misplaced” (Company Reply Brief at 12-13). The Company contends that G.L. c. 164, § 70 imposes an affirmative obligation on the Company to “put all such streets, lanes and highways in as good

repair as they were in when opened” (*id.*, citing G.L. c. 164, § 70; Boston Gas Company v. City of Newton, 425 Mass. 697, 699-700 (1997)). The Company asserts that neither Section 70 nor Section 70A requires the Company to seek “guidance and permission” from the Town Board of Selectmen prior to obtaining approval from the Siting Board. The Company claims that it is committed to seeking approval from the Town Board of Selectmen in due course, subsequent to the Siting Board’s approval of the Project Change.

Overall, Colonial believes that relative to the approved route, the Project Change will address concerns raised by the Town of Sandwich, provide a minor cost advantage, provide an incremental safety benefit, and improve service reliability. For these reasons, the Company urges the Siting Board to approve the Project Change. (Exh. NG-1, at 10; Company Brief at 26-27).

C. Analysis and Findings on Pipeline Realignment

Although it could have opted to proceed with construction of the approved route for the Pipeline without further review by the Siting Board, the Company initiated the PCF after it considered and ultimately followed the recommendations of several Town officials who urged the Company to realign the Pipeline north of Service Road rather than place it under the pavement on Service Road. These officials advanced several reasons for the Pipeline realignment, including protecting and maintaining existing utilities under Service Road, leaving room for future utility lines, enhancing public and worker safety, avoiding damage to the recently repaved road, and, and facilitating the construction of a long-planned, off-road bicycle path. In marked contrast, Representative Hunt and many Service Road area residents have voiced numerous concerns about the Project Change, including those related to safety, environmental impacts, traffic, and costs.

Service Road area residents have been far more engaged in the Project Change proceeding than they were in the Original Proceeding. In this proceeding, the Siting Board has performed a full and thorough review of the Project Change, including a public comment hearing in Sandwich, opportunities for additional intervention, and testimony by intervenor witnesses. Over the Company’s objections, the Siting Board allowed Representative Hunt to pose a number of questions to the Company about the merits of an alternative route along the NSTAR ROW, which had been previously rejected by the Board in the Final Decision.

The primary issue, among many raised by Representative Hunt, is safety relating to the Project Change. It is apparent that many of Representative Hunt's safety concerns are relevant to the approved route as well. Safety concerns are also central to Representative Hunt's recommendation for the Company and the Siting Board to reconsider use of the NSTAR ROW instead of Service Road for the Pipeline route.

By asking the Board to reconsider the use of the NSTAR ROW, Representative Hunt is seeking reconsideration of an issue decided in the Final Decision. As noted above, the power to reconsider Siting Board decisions must be "sparingly used." Stowe v. Bologna, 32 Mass.App.Ct. 612, 615 (1992) (internal citations omitted) aff'd 415 Mass. 20 (1993). A distinction must be made, however, between reconsidering an earlier decision and developing a record on the issue as to whether such reconsideration is appropriate. The Board does not agree with the Company that the limitations on reconsidering earlier decisions should constrain the Board from developing a complete record on the issues raised by Representative Hunt. To the contrary, allowing Representative Hunt to introduce evidence on safety and other issues has assisted the Board in addressing whether this case constitutes one of those rare instances that justify reconsidering an earlier decision.

Consequently, while the Board is mindful of the judicial and statutory constraints in revisiting the Original Decision, the Board has allowed the parties in this proceeding to develop a comprehensive record that informs the questions before the Board. These questions address not only which Service Road route is superior, but also whether any new facts or circumstances since issuance of the Final Decision warrant the use of the NSTAR ROW alternative instead of one of the Service Road route options. The Board believes that the comprehensive scope of review (including the NSTAR ROW alternative) permitted in this proceeding is warranted given the numerous safety-related concerns raised by Service Road residents during the public comment hearing and by Representative Hunt.

Accordingly, in this Decision, the Board considers not only whether the PCF should be approved, but also whether Representative Hunt has presented a sufficient case for reconsidering issues already decided: i.e., whether the NSTAR ROW should be used rather than the Service

Road ROW. Following this determination, the Board then considers the second aspect of the PCF concerning the method of pipeline testing and the resulting implications for MAOP.<sup>19</sup>

1. Comparison of Project Change Route and Approved Route

With regard to safety of the Service Road route options, the Board notes that many safety-related features included in the Project Change are typical of the Company's general approach for constructing pipelines, and do not reflect unique measures that would be undertaken specifically for the Project Change. For example, typical measures included in the Project Change include: the use of high quality steel pipe with factory coating for corrosion protection; proper installation; performance tests; an ongoing program of testing and maintenance; and strict compliance with applicable state and federal safety regulations (Exh. EFSB-10, at 12-13).

The Company has offered some safety features specifically for the Project Change such as the placement of steel plates above the Pipeline to provide additional protection in any areas where it crosses the paved edge of Service Road. In addition, the Company has agreed to use remotely operated shut-off valves (in addition to manual valves) along the Pipeline that would allow sections of the Pipeline to be isolated immediately in the event of an incident (Exh. EFSB-10(a)).

The record indicates that relative to the approved route, the Project Change enhances safety in several respects. First, by moving the Pipeline approximately 15 feet farther away from Service Road area residents, the Project Change would provide increased distance for residents and their homes from the location of any potential Pipeline incident. The homes on the south side of Service Road would typically be 120 to 150 feet or more from the work area for the Project Change route (Exh. EFSB-7). As noted by the Company, the additional 15-foot distance from homes is not significantly different from that provided by the approved route, but it would make the Pipeline "incrementally safer."<sup>20</sup>

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<sup>19</sup> Given that the Pipeline could be tested either hydrostatically or pneumatically for any of the three route options, the method of Pipeline testing does not affect the Board's determination of a preferred route.

<sup>20</sup> By comparison, the Company's existing twelve-inch, 270 MAOP gas pipeline, built approximately 50 years ago, lies approximately 35 to 40 feet closer to Service Road area residents than the Project Change location (Exh. NG-1, at Figure 4; Tr. at 77-78).

The approved route would place the Pipeline in close proximity to other utilities under Service Road such as water supply and fire hydrant lines, and near future utilities under consideration, such as new sewer lines. The realignment of the Pipeline 15 feet north of the paved edge of Service Road would provide a safety improvement by placing the Pipeline farther away from these other utilities in Service Road and the related risk of damage to the Pipeline from accidental contact by work on these other utility lines. The record shows that nationwide, incidents involving high-pressure pipelines are most often caused by dig ins by a third party (Exh. EFSB-10). Therefore, installation away from existing utilities and potential future utility locations serves to enhance safety.

The Project Change location 15 feet north of Service Road is in an area not expected to be used for other utilities; in fact, the request to move the Pipeline to this area was specifically intended to retain adequate space under Service Road for installation of other utilities. The increased separation between utilities resulting from the Project Change would also help protect the other utility lines from construction or maintenance work on the Pipeline. Given the apparent susceptibility of the existing asbestos-cement water mains to damage this benefit is significant, and one of the primary factors cited by the Town officials in recommending the Project Change. By avoiding potential damage to water supply or fire hydrant lines the Project Change provides an additional safety benefit.<sup>21</sup>

One potential safety advantage of keeping the Pipeline under the road as part of the approved route is the added protection from heavy vehicle loads offered by the pavement. However, the Company has calculated that placing the Pipeline under three feet of soil with the Project Change would also provide adequate protection and meet applicable state and federal

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Representative Hunt's witness acknowledged the existing pipeline raises many of the same safety-related issues alleged for the new Pipeline (Tr. at 165-166).

<sup>21</sup> The record demonstrates that the Company has ample prior experience working in areas of asbestos-cement pipe, and there is no reason to doubt its ability to conduct Pipeline construction work required by either the approved route or the Project Change (Exh. EFSB 10(c)).

requirements (RR-EFSB-1; RR-EFSB-7).<sup>22</sup> To provide added safety, the Company is willing to install steel plates at each location where the Pipeline would cross under the edge of pavement, thus providing much of the protection afforded by pavement and its weight distribution properties.

With regard to incident response, Representative Hunt asserts that the absence of fire hydrants and public water supply lines for approximately two miles of the Project Change route is a safety risk and a reason for the Board to question the Project Change. However, given use of the same roadway, there is no difference between the approved route and the Project Change route with regard access to water supplies for fire-fighting purposes. The record indicates that, in fact, National Grid has a number of high-pressure pipelines on its system in Massachusetts in residential areas where public water supplies and fire hydrants are unavailable (Exh. RHPS-8; RR-RH-2). We note as well that the record indicates that there is no regulatory requirement regarding the co-location of high-pressure pipelines of the type proposed in the PCF (or previously approved) with water and hydrant lines (Exhs. EFSB-27; RHDC-08; RR-RH-2).<sup>23</sup> Additionally, as part of the Project Change the Company has proposed to provide training for first responders in Sandwich and to organize a mock incident to prepare area residents as to how to respond to such a situation.

With respect to egress of area residents in the event of a Pipeline incident, both the Project Change route and the approved route have similar characteristics. However, given the location of the Project Change route 15 feet away from the paved edge of Service Road, there may be some incremental ability to use Service Road in the event of a Pipeline incident. We agree with Representative Hunt that having more than one means of egress during an incident affords a greater degree of public safety. But taking all of the factors into account, the evidence

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<sup>22</sup> In the event that less than three feet of cover is required for construction, the Company shall comply with all applicable state and federal regulations, in consultation with the Director of the Pipeline Engineering and Safety Division of the Department. The Siting Board notes that steel plates, rather than concrete caps, are better suited in such a situation because the steel plates provide more protection than concrete.

<sup>23</sup> The Town has indicated that it may develop additional utilities along the Pipeline route in the future. If it does so, the Siting Board encourages the Town to consider extending the existing water supply infrastructure, including fire hydrants, along the length of the Pipeline.

indicates that overall, the Project Change would enhance public and worker safety relative to the approved route.

Turning to environmental impacts, the record shows that the ten- to 15-foot strip of vegetation that would be removed from the wooded buffer area between Route 6 and Service Road totals approximately five acres (Exh. NG-1, at 7). In granting a certificate for the Project Change, the EEA Secretary determined that the proposed removal of vegetation is well below MEPA review thresholds for land alteration and that the Project Change impact is insignificant and would not require additional MEPA review (Exh. NG-1, at Appendix B).

Given the relatively limited proportion of the existing 70-120-foot wide vegetated buffer that would be removed, the diminution of the remaining wooded area to buffer both views of and noise from Route 6 affecting Service Road areas area residents would be modest. Indeed, the record shows that the projected noise increase of 0.2 to 0.3 dBA is considered imperceptible to human hearing (Exhs. RHDC-27; EFSB-10(i)). However, as noted by some area residents, the removal of even a narrow strip of vegetation may affect the appearance of Service Road itself, resulting in less of a woodland area aesthetic, which is a valued characteristic of the road.

To mitigate visual impacts, the Company proposes to offer the installation of evergreen buffer vegetation to abutting residents, which would effectively mitigate loss of visual buffer. The Siting Board directs the Company to offer to residents directly along Service Road between Route 130 and Chase Road screening plantings on the property of these residents, free of charge, as detailed by the Company in a filing with the CCC.

In order to substantiate the Company's claim that the noise impacts of removing the vegetation would be imperceptible, the Siting Board directs the Company to work with the Town to perform pre-construction noise measurements and post-construction noise measurements for each phase of the Western Segment, no more than six months following completion of the respective phases. The Company shall select comparable and appropriate time periods and appropriate noise metrics to evaluate changes in noise levels coming from Route 6 at residential property lines south of Service Road. An increase of three dBA or more will be considered a perceptible increase. The results of the Company's analysis must be submitted to the Siting Board for appropriate action and shared with the Town and interested abutters.

The removal of vegetation and the off-road construction associated with the Project Change would take place in an area where the NHESP has confirmed the presence of the eastern

box turtle and required the Company to implement a turtle protection plan to avoid a prohibited take of this species of Special Concern (Exhs. NG-1, at 7; EFSB-31). The Siting Board directs the Company to adhere to the requirements of the turtle protection plan. With regard to the vegetation to be removed, the record indicates that this would not involve any state-listed flora or so-called “specimen trees.”<sup>24</sup>

Turning to traffic impacts, the Company is proposing similar mitigation measures for the Project Change as approved by the Siting Board in the Final Decision, including a traffic management plan. The record shows that the off-road construction focus of the Project Change would present fewer traffic impacts than the approved route due to the less frequent or more limited need for lane closures during construction (Exh. NG-1, at 9).

The request by Town officials for the Company to pursue the Project Change stems, in part, from the Town’s interest in creating an off-road bicycle path along Service Road that would be facilitated by the Project Change (Exh. NG-1, at Appendix C). While the benefits of such a path are incidental to the purpose of constructing the Pipeline and have not been quantified in the PCF, the Board finds that the development of the off-road path could potentially provide air quality and traffic mitigation benefits as well as an important transportation and recreational resource for the Town and the broader Cape Cod region.

The additional land alterations involved with the Project Change might suggest a greater potential to disturb cultural resources than would occur with the approved route. However, based on the Company’s cultural resource study performed in the Original Proceeding, neither route is expected to pose any significant cultural resource concerns given prior disturbances to the area from construction of both Service Road and Route 6.

With or without the Project Change, diesel construction equipment emits particulate pollution. In cases filed since the Original Proceeding, the Siting Board has typically required retrofitting certain older diesel equipment to reduce particulate emissions. The record shows that the cost of requiring such a condition would be minimal (Company Comments on Issues Memorandum at 8). The Siting Board directs the Company to ensure that all diesel-powered

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<sup>24</sup> The CCC’s Model Bylaws and Regulations defines specimen tree as “a native, introduced or naturalized tree which is important because of its impact on community character, its significance in the historic/cultural landscape or its value in enhancing the effects of wildlife habitat.”

non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of Project Change construction must have U.S. Environmental Protection Agency-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies (to the extent that they are commercially available) installed on the exhaust system side of the diesel combustion engine. Prior to the commencement of construction, the Company shall submit to the Siting Board certification of compliance with this condition and a list of retrofitted equipment, including type of equipment, make/model, model year, engine horsepower, and the type of emission control technology installed.

In view of the above environmental considerations, the Siting Board finds that the Project Change, as mitigated, presents comparable overall environmental impacts to those associated with the Pipeline using the approved route.

With regard to cost, the record shows that the Project Change is anticipated to cost approximately \$375,000 to \$450,000 less than the approved route (Exh. EFSB-34). The cost advantage stems from reduced cutting and repair of pavement, offset by greater costs for tree clearing and grading.

Considering environmental impacts, cost, and reliability, as well as safety, the Siting Board finds that, with the conditions described below, the Project Change would be advantageous relative to the approved route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

## 2. PCF Route vs. NSTAR ROW

As noted above, Representative Hunt asserts that the NSTAR ROW alternative route has safety advantages relative to the Project Change route and should be re-considered by the Board in this proceeding. The Siting Board permitted Representative Hunt to explore this issue in discovery and to further address the issue in the testimony of his witnesses, during his cross-examination of Company witnesses and in briefs. Having reviewed the evidence supplied by the parties, we conclude that the standards for reconsideration set forth in Stowe have not been met.

Representative Hunt points out that there are no roads that end in a cul-de-sac crossing the NSTAR ROW route and that the NSTAR ROW route provides more flexibility than the Project Change route regarding egress in the event of a Pipeline incident. However, a number of other safety-related considerations are disadvantageous for the NSTAR ROW relative to the

Project Change route. The risk of inadvertent dig ins on the NSTAR ROW route is greater due to the highly developed area along Route 130 (part of the NSTAR ROW route) and ongoing development activity along Route 130. Also, the two routes have a similar number of homes, so avoidance of residential areas is not achieved with the NSTAR ROW route (Tr. at 57-59). In addition, homes along the NSTAR ROW route are, on average, significantly closer to the potential pipeline than would be the case with the Project Change. The closer proximity of homes to the Pipeline on the NSTAR ROW could increase the risk of damage to life and property in the event of a serious incident, as well as raise the potential for inadvertent dig ins of the Pipeline.

Additional safety-related complications could arise on the NSTAR ROW from co-locating the Pipeline in an electric transmission corridor. As noted by the Company, access by emergency vehicles to the NSTAR ROW and subsequent firefighting activity could not commence until the transmission lines were de-energized (Exh. EFSB-10, at 6). The Company also noted an added safety complication of the NSTAR ROW route in that it would need to design the Pipeline to minimize the adverse effects of induced current on the Pipeline's cathodic protection system from the power lines (RR-EFSB-6).

Overall, the safety profile of the NSTAR ROW is not advantageous relative to the Project Change route. Additional difficulties noted by the Company with using the NSTAR ROW include: (1) the requirement for legislative approval of the route, associated with its location partly on lands protected by Article 97; (2) a need for consent from NSTAR; (3) a need to obtain legal authority for such construction from at least 58 of the approximately 71 property owners along the route; and (4) the increased difficulty in tying the new segments back to the existing Sagamore Pipeline (Exh. RHDC-03). Colonial Decision at 314-315. The Company noted the potential for delay resulting from these factors.

The additional review of the NSTAR ROW afforded in this proceeding does not alter the finding in the Final Decision that the NSTAR ROW alternative route is inferior to the approved Service Road route. As found above, with the Project Change resulting overall in an improved Pipeline route relative to the approved route, the NSTAR ROW alternative fares even worse by comparison to the Project Change than it did previously relative to the approved route. Accordingly, the Siting Board finds no reason to alter our previous findings with respect to the

NSTAR ROW alternative, or further study the NSTAR ROW alternative, as suggested by Representative Hunt.

Considering environmental impacts, cost, reliability, and safety, the Siting Board finds that, with the conditions described in Section VI, the Project Change route would be advantageous with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

## V. PIPELINE TESTING

### A. Proposed Change of Pipeline Testing Method

#### 1. Hydrostatic Testing Procedure

Pursuant to the Project Change, hydrostatic testing of the Pipeline would proceed as follows: the newly constructed pipe would be filled with potable water, pressurized to the test pressure, stabilized, and monitored for at least twelve hours (Exh. NG-1, at 13). Approximately 180,000 gallons of water would be required for the hydrostatic test, which the Sandwich Water District indicated it would provide (*id.*). The water would be tested before being drained from the pipe and, with satisfactory test results, discharged through a fabric filter into an upland area (*id.*). The inside of the Pipeline would then be dried and cleaned (*id.*).

#### 2. Significance of Pre-Operational Hydrostatic Testing

Allowing the Company to test the Pipeline hydrostatically so that it may qualify for a MAOP of 575 psig before it is operational may prevent future delays and service impacts (Exh. NG-1, at 11). If the pressure is increased after the Pipeline becomes operational, such an increase may be effected without removing the Pipeline from service and potentially interrupting natural gas supply to customers (*id.*). Once the Pipeline has qualified for a MAOP of 575 psig the Company would not need to secure formal approval from the Pipeline Safety Division of the Department in order to increase the Pipeline pressure (RR-EFSB-9).

#### 3. Pressure-Related Safety Regulation

The Pipeline Safety and Engineering Division of the Department would oversee the operation of the Pipeline, and has the authority to suspend or restrict the use of the Pipeline if it finds that operation of the Pipeline, whether as a result of increased pressure or otherwise, is a

threat to public safety (RR-EFSB-9). The Pipeline Safety and Engineering Division implements a comprehensive set of federal and state statutes and regulations designed to ensure pipeline safety. Furthermore, there are both federal and Commonwealth statutes through which the Town and its residents may seek to obtain relief from pipeline conditions they consider unsafe. The Commonwealth statute is G.L. c. 164, 105A, and the federal statute is 49 U.S.C. § 60121(a)(1). These statutes are discussed in detail below.

B. Position of the Parties

1. Representative Hunt's Argument

Representative Hunt raises a number of objections to the Company's proposal to test the Pipeline so that it may qualify for a MAOP of 575 psig (Exh. RH-1). Representative Hunt asserts, "We do not believe that [installing] the 270 psig is the real intent here nor should it be treated that way. Installing a 575 psig pipeline is the real purpose of this project" (Hunt Brief at 11). He further contends, "high pressure pipelines do not belong in residential neighborhoods" (Exh. RH-1, at 3). At the higher operating pressure, Representative Hunt asserts that the "impact zone" of a Pipeline incident would be expanded, threatening additional Service Road residents (Hunt Brief at 8). Finally Representative Hunt argues that the testing should be done when the need for any pressure increase arises – not years in advance – as the Pipeline's integrity should be re-validated when the change actually occurs (*id.*).

2. The Company's Argument

According to Colonial, a Pipeline with a MAOP of 270 psig can meet its current and reasonably foreseeable demand (Exh. NG-1, at 11). However, if demand were to increase substantially in the future, higher pressure operations of the Pipeline could be warranted (Exh. NG-1, at 11; Tr. at 98-99).

The Company asserts that the principal advantage to qualifying the Pipeline for 575 psig before it is operational is that it would avoid the need for testing in the future, which could involve service interruptions for customers at that time (Exh. NG-1, at 11; Tr. at 98-99). Colonial states that any increase in Pipeline pressure would be conducted with the oversight of the Pipeline Safety and Engineering Division of the Department (RR-EFSB-9). The Company acknowledges that it would not need to secure formal approval from the Department in order to

increase the Pipeline pressure once it is qualified at the 575 psig MAOP following a successful pressure test (RR-EFSB-9).

C. Analysis and Findings Regarding Pressure Test Changes

The proposal to pressure-test the Pipeline so that it qualifies for a MAOP of 575 psig raises two issues. First, would it be safe to test the Pipeline, in the manner proposed, at the proposed pressure?<sup>25</sup> Second, would it be safe to operate the Pipeline at 575 psig?

The record indicates no risks from the hydrostatic pressure testing procedure itself. A successful test would result in discharge of all the potable water supplied by the Sandwich DPW for the test to a nearby upland area, without any anticipated environmental impacts. In the event that the Pipeline failed the proposed hydrostatic test, a small amount of the potable water would be lost through leakage and the remaining water would be discharged as planned, again without environmental impacts.

The PCF requests permission to test the Pipeline so that it qualifies for a MAOP of 575 psig. The PCF does not request permission to operate the Pipeline at 575 psig at this time. Nevertheless, once the Pipeline has qualified for a MAOP of 575 psig, the Company would not need to secure formal approval from the Pipeline Safety Division of the Department in order to increase the Pipeline's pressure (RR-EFSB-9). Therefore, allowing the Company to test the Pipeline to establish a MAOP of 575 psig could result in the Pipeline operating at that pressure in the future.

Allowing the Company to test the Pipeline hydrostatically so that it may qualify for a MAOP of 575 psig before it is operational could provide a significant reliability benefit. In the event that the Pipeline pressure should or must be increased in the future, such an increase may be effected without removing the Pipeline from service and thereby disrupting natural gas supply to customers. Consequently, we conclude that it is appropriate to allow the Company to perform a hydrostatic test with the intent of qualifying the Pipeline for a MAOP of 575 psig.

Whether the Board chooses to allow the Pipeline to actually operate at up to 575 psig is a separate issue. The Siting Board observes that there are numerous regulatory safety measures in

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<sup>25</sup> As mentioned above, in order to test the pipeline so that it would qualify for an MAOP of 575 psig, the pipeline must be pressurized to 862 psig: i.e., one and one-half times the MAOP of 575 psig.

place that protect the public. The Pipeline Safety and Engineering Division of the Department would oversee the operation of the Pipeline and implement a comprehensive set of federal and state statutes and regulations designed to ensure pipeline safety. This Division of the Department also has the authority to suspend or restrict the use of the Pipeline if it finds that operation of the Pipeline, whether as a result of increased pressure or otherwise, is a safety concern.

In addition, as mentioned above, there are both federal and Commonwealth statutes through which Sandwich residents may seek to obtain relief from pipeline conditions they may consider unsafe. 49 U.S.C. § 60121(a)(1); G.L. c. 164, § 105A. The Commonwealth statute provides that either the selectmen of a town in which a gas company operates or 20 of the company's customers may file a written complaint with the Department regarding, among other things, the "pressure at which [natural] gas is being or shall be stored, transported, or distributed." Subsequent to the filing of a complaint, the Department is required to notify the gas company and to "give a public hearing to such petition and to such company." G.L. c. 164, § 105A. After the hearing, the Department may make such order "as it may deem necessary." G.L. c. 164, § 105A.

The federal statute, 49 U.S.C. § 60121(a)(1), provides that a "person may bring a civil action in an appropriate district court of the United States for an injunction against another person . . . for a violation of this chapter or a regulation prescribed or order issued under this chapter." The chapter in question is 49 U.S.C. Chapter 601, which addresses pipeline safety.

Although there are numerous safeguards against risks that could be caused by operation of the Pipeline above 270 psig, we concur with Representative Hunt that additional review by the Siting Board is warranted if such a pressure increase for the Pipeline is actually sought by the Company. For example, if the Company were to seek to increase the pressure several years hence, there could be a legitimate question as to whether re-testing would be appropriate. Thus, if the Company seeks to operate the Pipeline at a MAOP in excess of 270 psig in the future, the Siting Board directs it to request permission to do so from the Board in a compliance filing. In such filing, the Company must inform the Board of the reason for the proposed increase in pressure and any relevant information for the Board to consider regarding the safety of the proposed pressure increase, including whether there is cause to re-test the Pipeline at that time.

Upon receipt and review of such request, the Board will determine whether the pressure increase sought is approved, approved with conditions, or denied.

## VI. DECISION

Consistent with the Siting Board's directive to Colonial in the Final Decision to inform the Board of any changes to the Project, other than minor variations, the Company has informed the Siting Board of two such changes: the relocation of Phase I and Phase II of the Western Segment of the proposed Pipeline to a path that is generally 15 feet north of Service Road rather than beneath Service Road; and the testing of the proposed Pipeline hydrostatically for a MAOP of 575 psig rather than pneumatically for a MAOP of 270 psig. In Section IV, above, the Board found that, with the imposition of certain conditions, locating Phase I and Phase II of the Western Segment of the proposed Pipeline would be advantageous with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. In that section, the Board also found that the evidence in this proceeding would not justify the Board's reconsideration of the decision made in the Original Proceeding to allow the Pipeline to be located along Service Road rather than the NSTAR ROW route. In Section V, above, the Board found that allowing the Company to test the Pipeline hydrostatically so that it qualifies for a MAOP of 575 psig before it is operational would provide a significant reliability benefit.

Accordingly, based on the findings articulated above, the Board approves the PCF subject to compliance with Conditions (A) through (F) in the Final Decision and the following additional conditions:

(G) In order to minimize environmental impacts, the Siting Board directs the Company to ensure that all diesel-powered non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of construction of Phases I and II of the Western Segment must have U.S. Environmental Protection Agency-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies (to the extent that they are commercially available) installed on the exhaust system side of the diesel combustion engine. Prior to commencement of construction, the Company shall submit to the Siting Board certification of compliance with this condition and

a list of retrofitted equipment, including type of equipment, make/model, model year, engine horsepower, and the type of emission control technology installed.

(H) In order to minimize visual impacts, the Siting Board directs the Company to offer to residents directly along Service Road between Route 130 and Chase Road screening plantings on the property of these residents, at no cost to the homeowner, as detailed by the Company in a filing with the CCC on January 15, 2013. Typical plantings shall be native evergreens and would generally be planted on the homeowner's property.

(I) In order to enhance Pipeline safety, the Siting Board directs the Company to install steel plates above the Pipeline at locations where the Pipeline would cross under the edge of pavement on Service Road.

(J) The Siting Board directs the Company to work with the Town of Sandwich to perform pre-construction noise measurements and post-construction noise measurements for each phase of the Western Segment, no more than six months following completion of the respective phases. In order to substantiate the claim that the noise impacts of removing the vegetation would be imperceptible, the Company shall select comparable and appropriate time periods and appropriate noise metrics to evaluate changes in noise levels coming from Route 6 at residential property lines south of Service Road. An increase of three dBA or more will be considered a perceptible increase. The results of the Company's analysis must be submitted to the Siting Board for appropriate action and shared with the Town and interested abutters.

(K) The Company is directed to sponsor a simulated incident for the benefit of first responders in Sandwich. The training will enable the Company and first responders to plan for a variety of potential scenarios, including matters of egress for abutters, as well as matters of access for Company personnel in the event of challenging traffic conditions.

(L) The Siting Board directs the Company to provide specific training to the members of the Sandwich Fire Department and any other interested Town officials focusing on: response to an incident relating to the two 270-psig pipelines along Service Road; communication among the parties in the event of such an incident; and the parties' responsibilities during such an incident.

(M) The Company is directed to install remote-operated shut-off valves along the Pipeline.

(N) The Pipeline shall be designed, installed, operated and maintained in accordance with all federal and state regulations as well as the Company's internal guidelines, which in certain instances go beyond federal and state safety regulations.

(O) The Siting Board directs the Company to implement a turtle protection plan to avoid a prohibited take of this species of Special Concern and to adhere to the requirements of the turtle protection plan.

(P) The Company is hereby directed to provide the Siting Board with a certified cost estimate for construction of the Pipeline, prior to construction, which explains any cost changes relative to the information presented in this proceeding. In addition, the Company is directed to provide the Siting Board with a final cost of Pipeline construction within 60 days of its completion.

(Q) The Siting Board directs the Company to conduct all construction work between the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, excluding holidays, from after Labor Day to before Memorial Day. To the extent the Company finds that construction is necessary outside of these weekday hours or on weekends or holidays, or during the period from Memorial Day through Labor Day, the Company shall seek written permission from the relevant Town of Sandwich authorities prior to the commencement of such work, and provide the Siting Board with a copy of such permission. If the Company and Town officials are not able to agree on such request, the Company may file a written request for authorization to the Siting Board prior to performing such construction, provided that it also notifies the relevant Town of Sandwich authorities in writing of such request.

(R) The Board incorporates by reference the conditions imposed by the CCC in its approval of the DRI. Consequently, the conditions imposed on the Project by the CCC are now part of the Project. A project change filing would be required in order to construct the Project in a manner inconsistent with the Project description.

(S) If the Company seeks to operate the Pipeline at a MAOP in excess of 270 psig in the future, the Siting Board directs that the Company must request permission to do so from the Board in a compliance filing. In such filing, the Company must inform the Board of the reason for the proposed increase in pressure and any relevant information for the Board to consider regarding the safety of the proposed pressure increase, including whether there is cause to re-test

the Pipeline at that time. Upon receipt and review of such request, the Board will determine whether the pressure increase sought is approved, approved with conditions, or denied.

Findings in this decision are based upon the Project change information provided by the Company examined in light of findings the Siting Board made in the Final Decision. Because the Project changes outlined in this decision pertain to the facility approved by the Siting Board in the Original Proceeding, the Company must construct and operate its facility in conformance with its proposals presented in the Original Proceeding; the only modifications permitted are those set forth in this decision. The activities described in this Project Change approval are authorized within the time authorized for the Project as a whole, which is December 31, 2019.

The Siting Board requires the Company to notify the Siting Board of any further 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 is obligated to provide the Siting Board with sufficient information on changes to the proposed Project to enable the Siting Board to make these determinations.



Robert J. Shea  
Presiding Officer

Dated this 14<sup>th</sup> day of August, 2014

APPROVED by the Energy Facilities Siting Board at its meeting of August 14, 2014, by the members and designees present and voting. **Voting for** approval of the Tentative Decision (as amended): Mark Sylvania, Acting Chair, Designee for Secretary, Executive Office of Energy and Environmental Affairs; Ann G. Berwick, Chair, Department of Public Utilities; Meg Lusardi, Commissioner, Department of Energy Resources; Laurel Mackay, Designee for Commissioner, Department of Environmental Protection; Dan Kuhs, Public Member, and Kevin Galligan, Public Member. **Voting against** approval of the Tentative Decision, (as amended): Jolette Westbrook, Commissioner, Department of Public Utilities.



Mark Sylvania, Acting Chair  
Energy Facilities Siting Board

Dated this 14<sup>th</sup> day of August, 2014

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 said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the clerk of said court. (Massachusetts General Laws, Chapter 25, Sec. 5; Chapter 164, Sec. 69P).

COMMONWEALTH OF MASSACHUSETTS  
Energy Facilities Siting Board

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The University of Massachusetts  
at Amherst, Request for Supplemental  
Advisory Ruling, EFSB 14-3  
\_\_\_\_\_

August 14, 2014

SUPPLEMENTAL ADVISORY RULING

In an Advisory Ruling issued on August 20, 2012 (“Advisory Ruling”) the Energy Facilities Siting Board (“Siting Board” or “Board”) advised the University of Massachusetts at Amherst (“UMASS”) that it could construct and operate a temporary liquefied natural gas (“LNG”) storage facility to fuel UMASS’s Campus Heating Plant (“CHP”).<sup>1</sup> The Advisory Ruling stated that the LNG storage facility would not require G.L. c. 164, §69J approval from the Siting Board provided that the storage capacity not exceed 30,000 gallons and that the facility operate no later than the end of the 2013/2014 heating season.<sup>2</sup>

By memorandum dated April 10, 2014 (“April 10 Memo”) the consulting firm of Woodard & Curran, Inc. (“Woodard”), acting on behalf of UMASS, requested that the Siting Board confirm that UMASS could continue to operate its temporary LNG storage facility beyond the 2013/2014 heating season indefinitely without need of Siting Board approval.<sup>3</sup> On May 20, 2014, UMASS officials met with the Department of Public Utilities (“Department”) Pipeline Engineering and Safety Division (“Pipeline Safety”) to discuss the temporary LNG installation.

<sup>1</sup> The UMASS CHP facility is designed to produce steam for central heating and 16 megawatts of electric power for campus use. The Campus Heating Plant can also be described as a combined heat and power plant (Advisory Ruling at 1-2).

<sup>2</sup> The Advisory Ruling was adopted by using the “Action by Consent” process described and authorized by 980 C.M.R. § 2.07. The Siting Board is authorized to issue advisory rulings pursuant to the provisions of 980 C.M.R. § 2.08 and G.L. c. 30A, § 8.

<sup>3</sup> Woodard asserted that the actual volume of LNG stored at the UMASS facility has never exceeded the Siting Board’s jurisdictional threshold of 25,000 gallons and would likely remain below 25,000 gallons in the future. However, the Advisory Ruling noted that UMASS’s willingness to limit actual storage of LNG to less than 25,000 gallons does not affect the capacity of the facility with respect to the applicability of Board jurisdiction under 980 C.M.R. § 1.01(4)(e) (Advisory Ruling at 5).

As a follow up to the May 20 meeting, on June 17, 2014 the UMASS assistant director of utilities sent a letter (with supporting documentation) to the director of Pipeline Safety requesting permission to continue operating the temporary LNG storage facility through the winter of 2016/2017. On June 20, 2014, Woodard forwarded to the Siting Board the June 17 UMASS communication to Pipeline Safety and revised the request contained in Woodard's April 10 Memo; UMASS would instead seek an extension of the Advisory Ruling requesting that the university could continue operation of the temporary LNG storage facility, with up to 30,000 gallons of storage capacity, through the winter of 2016/2017.

## I. BACKGROUND

### A. The Initially Proposed UMASS LNG Facility

The UMASS CHP facility, commissioned in 2008, is a flexible dual-fuel installation that can burn natural gas, ultra-low-sulfur distillate oil ("ULSD"), or a combination of both at the same time. Because the CHP facility receives interruptible natural gas service from Berkshire Gas Company, gas deliveries are frequently curtailed in the winter. When natural gas is curtailed, UMASS has used ULSD as a supplemental fuel, albeit with higher costs, higher emissions, and limitations on operational flexibility compared to natural gas use. In its April 26, 2012 request for an Advisory Ruling, UMASS proposed to the Siting Board a temporary LNG storage facility to test the viability and economics of using LNG as a backup fuel for its CHP unit over the 2012/2013 and 2013/2014 winter seasons.<sup>4</sup>

UMASS considered two LNG storage alternatives. One alternative involved placing two skid-mounted 15,000-gallon LNG storage tanks with a skid-mounted vaporization unit next to the CHP plant, for a total storage capacity of 30,000 gallons. The other alternative involved parking two LNG tanker trailers next to the skid-mounted vaporization unit. Each tanker trailer would have a capacity ranging from 10,000 to 13,000 gallons, which would result in a total storage capacity of up to 26,000 gallons.

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<sup>4</sup> UMASS indicated that some use of ULSD would still be necessary during the winter, although it hoped to reduce the volume of ULSD as much as possible.

B. The Advisory Ruling

As noted in the Advisory Ruling, the Board must approve a petition for construction of any jurisdictional facility pursuant to G.L. c. 164, § 69J. “Facility” is defined in G.L. c. 164, § 69G, and includes a unit capable of storing LNG, “except such units below a minimum threshold size as established by regulation.” Pursuant to this express statutory authority, the Siting Board has adopted a regulation providing for exemptions for certain gas storage facilities from Board jurisdiction. 980 C.M.R. § 1.01(4)(e).

The regulation at 980 C.M.R. § 1.01(4)(e)(1) establishes an exemption from Siting Board jurisdiction for gas storage facilities with a capacity of less than of 25,000 gallons. Because both of the UMASS alternatives involved LNG storage facilities with a capacity greater than 25,000 gallons, the Siting Board concluded that the proposed LNG storage facility would not qualify for the exemption provided by Section 1.01(4)(e)(1) (Advisory Ruling at 5).

Instead, the Siting Board decided that it would waive its minimum size regulation, as authorized by 980 C.M.R. § 1.02(1).<sup>5</sup> The Board found good cause to waive the minimum size regulation because the regulation is intended to exempt non-utility storage facilities (the UMASS LNG storage facility is a non-utility facility) and the UMASS storage facility would be close to the 25,000-gallon jurisdictional threshold (*id.* at 5-6). The Board also noted that the UMASS facility would be temporary in nature, and was expected to produce cost savings, emission reductions, and reliability benefits (*id.* at 6).

C. The Actual UMASS Facility

Following issuance of the Advisory Ruling, UMASS began the permitting process for the temporary LNG Facility, along with obtaining storage facility equipment, LNG supplies, and LNG transportation via a Request for Proposal (“RFP”) process. Consistent with the Advisory Ruling, the LNG Facility was designed and permitted to operate for two heating seasons, beginning in December 2012. Site construction was completed in the fall of 2012 and UMASS began using LNG to fuel the CHP equipment in December 2012. Over the last two winter

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<sup>5</sup> Section 1.02(1) of the 980 C.M.R. provides that “Where good cause appears, not contrary to statute, the Board and any Presiding Officer may permit deviation from any rules contained in 980 C.M.R.”

heating seasons, UMASS vendors provided LNG supply by connecting a skid-mounted vaporization unit to the CHP plant and storing LNG in up to two tanker trailers parked beside the vaporization unit. The LNG equipment was dismantled and removed during the non-winter months. LNG was delivered as needed by tanker trailers from two LNG suppliers: GDF Suez and Prometheus Energy. Woodard stated that the tanker trailers ranged in size from 10,000 to 13,000 gallons capacity, although most were not greater than 12,500 gallons.

In the June 20, 2014 communication to the Siting Board, Woodard provided a report prepared by UMASS regarding the results to date of the temporary LNG storage facility and the university's future plans. According to UMASS, the CHP facility used a total of 359,813 million British thermal units ("MMBtu") of LNG over the two-year period, producing cost savings of \$3.9 million and 7,230 metric tons of carbon dioxide ("CO<sub>2</sub>") emission reductions compared to the use of ULSD. UMASS also noted that because the duct burner in the CHP unit can only operate on natural gas, the use of LNG has improved reliability of the CHP unit on peak winter days when natural gas is curtailed.

UMASS's report indicated that the university is "in the midst of a construction boom as the campus expands its facilities to meet its academic and research goals." The report noted that the number of new buildings being built over the next three years will increase both steam and electrical load served by the CHP unit and that UMASS is currently examining options to serve this future load. Due to capacity limits on natural gas from Berkshire Gas, new load during the winter months will increase the amount of backup fuel used in the CHP – either LNG or ULSD.

UMASS stated that it has tasked the engineering firm of Fuss & O'Neill with examining the feasibility of constructing a permanent LNG facility. The facility would utilize the same site, but would have two 18,000-gallon vertical tanks. Due to the amount of additional study needed and continuing market uncertainties, UMASS stated that it cannot commit the necessary resources for a permanent LNG facility at this time. Furthermore, UMASS contends that a permanent storage facility could not be permitted and constructed in time for the upcoming heating season. Based on these assertions, UMASS is seeking a three-year extension of the Siting Board's Advisory Ruling waiver.

## II. ANALYSIS

In the Advisory Ruling, the Board used its authority granted by 980 C.M.R. § 1.02(1) to waive the 25,000-gallon threshold that would have otherwise defined the UMASS LNG storage site as a facility subject to Siting Board jurisdiction. The Board did so because it found good cause to permit the deviation and found that granting the waiver would not be contrary to the relevant statute, G.L. c. 164, § 69G.

The reasons that demonstrated good cause for the Advisory Ruling waiver in 2012 remain valid today. The gas storage capacity of the LNG facility is close to the jurisdictional threshold and involves a non-utility, temporary facility; substitution of LNG for ULSD reduces carbon emissions and other pollutants and thereby furthers the environmental policies of the Commonwealth; and the LNG storage facility is beneficial to the students, staff and faculty of UMASS and the taxpayers of the Commonwealth by producing significant cost savings. The Siting Board also emphasizes on the fact that the UMASS LNG facility has been inspected yearly since its inception, and such inspections have found the facility compliant with federal, state, and local safety requirements.<sup>6</sup>

As proposed by UMASS, the LNG storage facility would remain a “temporary” facility and, UMASS argues, should be considered as such for the next three years by both the Siting Board and Pipeline Safety. The Siting Board notes that pursuant to federal and Department regulations, mobile and temporary LNG facilities are subject to less stringent construction and operational requirements than permanent LNG facilities. 49 C.F.R. § 193.2019; 220 C.M.R. § 112.01 *et seq.* According to the director of Pipeline Safety, there is no prescribed time period for an LNG facility to transition from a temporary or short-term application facility to a permanent one. The director of Pipeline Safety interprets “temporary” as a relatively brief time period and expects the transition to a permanent facility to occur as soon as practicable.

UMASS has provided several reasons as to why construction of a permanent LNG facility is not yet advisable or feasible. These include: (1) continuing developments in the natural gas marketplace that could increase supplies of pipeline gas in the coming years and

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<sup>6</sup> The director of Pipeline Safety reports that Department pipeline safety engineers inspected the UMASS LNG facility before the start of each of the past two heating seasons and will continue to do so.

render the use of LNG either unnecessary or overly costly; (2) the long lead time required to design a permanent storage facility and obtain Siting Board and other approvals; and (3) the time required to successfully complete the capital budgeting process within UMASS.

Nevertheless, the Siting Board finds that the requested three-year extension of the Advisory Ruling waiver and its basis, in part, on the LNG facility being considered a “temporary” facility, is too long and not necessary to address the specific concerns cited by UMASS. The Siting Board finds that a two-year extension, through the 2015/2016 heating season, is a sufficient amount of time for UMASS to complete its market and operational assessment of LNG storage and to determine appropriate next steps.

### III. SUPPLEMENTAL ADVISORY RULING

Accordingly, for the reasons stated above and in the 2012 Advisory Ruling, the Siting Board hereby advises that, pursuant to 980 C.M.R. § 1.02(1), there continues to be good cause to deviate from the 25,000-gallon threshold in 980 C.M.R. § 1.01(4)(e) in this matter and that such a deviation would not be contrary to statute. Therefore, the Siting Board further advises UMASS that it may continue to use two LNG tanks, as described above, with a combined capacity of 30,000 gallons or less, as a temporary LNG storage facility through the end of the 2015/2016 heating season at its CHP location without the need to seek facility approval from the Siting Board.

The caveats stated at the end of the Advisory Ruling remain in force. First, as set forth in 980 C.M.R. § 2.08, “[n]o advisory ruling shall bind or otherwise estop the Board in any pending or future matter.” If an entity seeks a binding decision of the jurisdictional issues raised by this proceeding, the entity may either file a petition to construct and raise the issue in the context of that proceeding or may seek a determination of Siting Board jurisdiction pursuant to 980 C.M.R. § 2.09.

Second, in rendering this Supplemental Advisory Ruling, the Siting Board assumes, but does not expressly find, that all material facts have been stated and that the facts are as represented by Woodard and UMASS in their submissions to the Siting Board. Should the

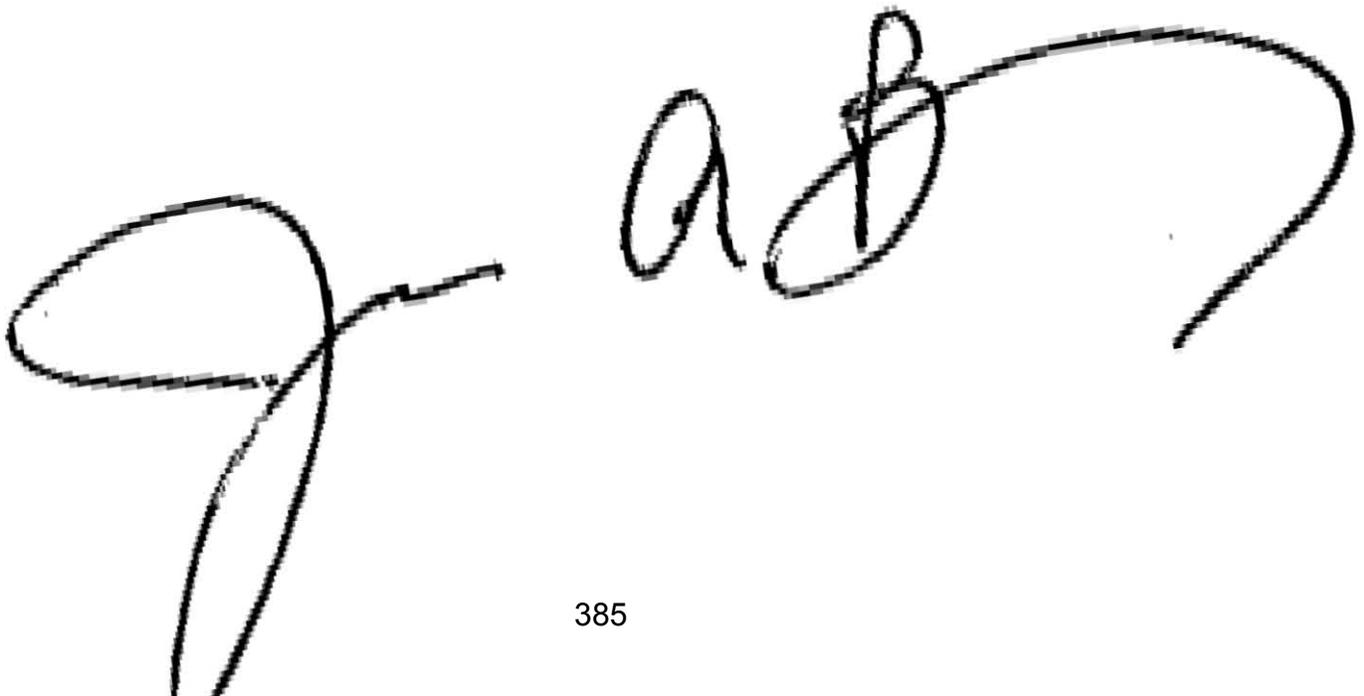
material facts presented by Woodard or UMASS change or be inaccurate, this Supplemental Advisory Ruling may not be applicable.



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James A. Buckley  
General Counsel

Dated this August 14, 2014



APPROVED by the Energy Facilities Siting Board at its meeting of August 14, 2014, by the members and designees present and voting. **Voting for** approval of the Supplemental Advisory Ruling: Mark Sylvania, Acting Chair, Designee of the Secretary of the Executive Office of Energy and Environmental Affairs, Meg Lusardi, Commissioner, Department of Energy Resources, Ann. G. Berwick, Chair, Department of Public Utilities, Jolette A. Westbrook, Commissioner, Department of Public Utilities, Laurel MacKay, Designee for Commissioner, Department of Environmental Protection; Kevin Galligan, Public Member; and Dan Kuhs, Public Member.



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Mark Sylvania, Acting Chair  
Energy Facilities Siting Board

Dated this August 14, 2014