

**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:

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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</u> , 7 DOMSB 19 (1998)
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</u> , 16 DOMSB 78 (2008)
<u>Brockton Decision 2000</u>	<u>Brockton Power LLC</u> , 10 DOMSB 157 (2000)
<u>Brockton Power Decision</u>	<u>Brockton Power Company LLC</u> , 17 DOMSB 157 (2009)
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, EFSB 10-1/D.P.U. 10-107/10-108 (2012)</u>
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, EFSB 10-2/D.P.U. 10-31/10-32 (2012)</u>
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

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<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> (w/o duct firing) 1.7 ppm@ 15% O <sub>2</sub> (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 (L<sub>90</sub>)</b>	<b>Proposed 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 (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.



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Robert J. Shea  
Presiding Officer

Dated this 10<sup>th</sup> day of October, 2013

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: 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 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.



Mark Sylvania, Acting Chair  
Energy Facilities Siting Board

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.



Salem Harbor Station Redevelopment Project  
Salem, Massachusetts

Aerial Photograph of Site  
(Overview)

Figure 1-2

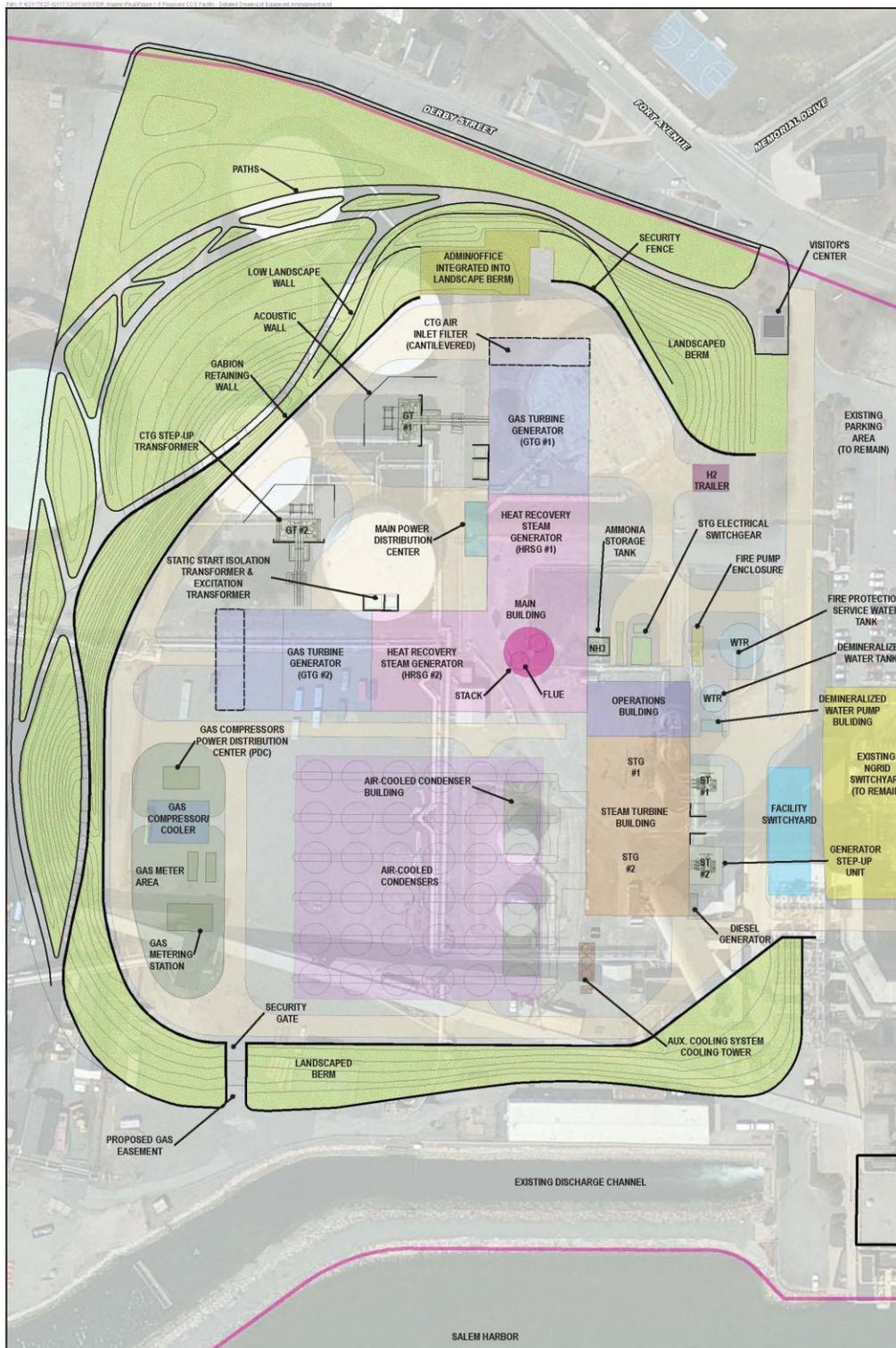
Attachment 2.



Salem Harbor Station Redevelopment Project Salem, Massachusetts

Proposed CCG Facility Overview of Equipment Arrangement Figure 1-4

Attachment 3.



Base Map: Bing 2010 Aerial

Salem Harbor Station Redevelopment Project  
Salem, Massachusetts

Proposed CCG Facility  
Detailed Drawing of  
Equipment Arrangement

Figure 1-5