COMMONWEALTH OF MASSACHUSETTS

Energy Facilities Siting Board

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In the Matter of the Petition of)

Brockton Power, LLC for Approval)

to Construct a Bulk Generating Facility in) EFSB 99-1

in the City of Brockton, Massachusetts)

_____)

FINAL DECISION

Peter M. Palica

Hearing Officer

March 10, 2000

On the Decision:

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Richard Essex

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LIST OF ABBREVIATIONS

Abbreviation Explanation

AALs Allowable Ambient Limits

ABB Asea Brown Boveri

AGT Algonquin Gas Transmission Company

Algonquin Algonquin Gas Transmission Company

ANP American National Power, Inc.

ANP Blackstone Decision ANP Blackstone Energy Company, EFSB 97-2/98-2 (1999)

AWRF City of Brockton's Advanced Water Reclamation Facility

BACT Best available control technology

BFI Browning Ferris Industries

BFI disposal facility BFI East Bridgewater waste disposal facility

BLSF Bordering Land Subject to Flooding

BMPS Best management practices

Brockton City of Brockton

Brockton Power Brockton Power, LLC

Brockton Power Project Brockton Power, LLC's proposed 270MW electric generating facility

BVW Bordering Vegetated Wetlands

C-2 Zoning designation for commercial use

Cancer Incidence Report 1997 Massachusetts Department of Health Report

on cancer incidence in 351 cities and towns

C&D Construction and demolition debris

CFR Code of Federal Regulations

cfs Cubic feet per second

cfsm Cubic feet per second per mile

CMR Code of Massachusetts Regulations

CO Carbon monoxide

CO_2 Carbon dioxide

Company Brockton Power, LLC

Company Initial Brief Brockton Power, LLC's initial brief

Company Reply Brief Brockton Power, LLC's reply brief

dBA Decibel

DEIR Draft Environmental Impact Report

E&S Erosion and sedimentation

EMF Electric and magnetic fields

EOEA Executive Office of Environmental Affairs

EPA The United States Environmental Protection Agency

EPC Engineering, procurement, and construction

ERP Emergency Response Plan

EUA Eastern Utilities Associates

FAA Federal Aviation Administration

FEMA Federal Emergency Management Agency

GEP Good Engineering Practice

gpd Gallons per day

HAPs Hazardous Air Pollutants

HAPs Study "Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units- Final Report to Congress" (1998)

HRSGs Heat recovery steam generators

I-3 Zoning designation for Heavy Industry

IDC Bellingham Decision IDC Bellingham LLC, EFSB 97-5 (1999)

I/I Infiltration and inflow

ISO Independent Source Operator

kV Kilovolt

L_{90} The level of noise that is exceeded 90 percent of the time

LAER Lowest Achievable Emission Rate

L_{dn} A-weighted noise levels averaged over a 24 hour period with a 10 dBA penalty for noise during nighttime hours

L_{eq} A-weighted noise levels averaged over a specified period

LOS Level of service -- a measure of the efficiency of traffic operations at a given location

LUW Land Under Water Bodies and Waterways

MAAQS Massachusetts ambient air quality standards

MGIS Massachusetts Geographic Information Systems

MBTA Massachusetts Bay Transportation Authority

MDEP Massachusetts Department of Environmental Protection

mG Milligauss

mgd Million gallons per day

MW Megawatt

MWPA Massachusetts Wetlands Protection Act

MVA Meg Volt-ampere

NAAQS National ambient air quality standards

1985 MECo/NEPCo Massachusetts Electric Company et al., 13 DOMSC 119 (1985) Decision

NOx Nitrogen oxides

NPDES National Pollution Discharge Elimination System

NRC National Research Council

NSPS New source performance standards

NSR New source review

NTEL Non-threshold Effects Exposure Limit

O_3 Ground-level ozone

OSHA Occupation Safety and Health Administration

Pb Lead

PM Particulate Matter

PM-10 Particulates

ppm Parts per million

ppmvd Parts per million volume dry

PSD Prevention of significant deterioration

Request for Comments Requests for Comments issued by Energy Facilities Siting Board on March 14, 1999 on proposed standards of review

Restructuring Act c. 164 of the Acts of 1997

ROW Right-of-way

SCR Selective Catalytic Reduction

Sigma Sigma Consultants, Inc. (appearing in this proceeding on behalf of Sithe)

SILs Significant Impact Levels

Sithe Sithe Energy, New England.

Sithe Edgar Decision Sithe Edgar Development LLC, EFSB 98-7 (2000)

Sithe Mystic Decision Sithe Mystic Development LLC, EFSB 98-8 (1999)

Siting Board Energy Facilities Siting Board

Siting Council Energy Facilities Siting Council

SO_2 Sulfur dioxide

SOx Sulfur oxides

SPCC Spill Prevention Control and Countermeasure

SPPP Stormwater pollution prevention plan

STGs Steam Turbine Generators

SWPPP Stormwater Pollution Prevention Program

TEL Threshold effects exposure limit

TLV Threshold Limit Value

Tofias Trust Julius Tofias Realty Trust

Town Town of West Bridgewater

TPS Technology Performance Standards

tpy Tons per year

USCOE U.S. Army Corps of Engineers

USGen U.S. Generating Company

USGS United States Geological Survey

VA United States Veterans Administration

VOCs Volatile organic compounds

West Bridgewater Town of West Bridgewater

The Energy Facilities Siting Board ("Siting Board") hereby APPROVES subject to conditions the petition of Brockton Power LLC for approval to construct a 270-megawatt natural gas-fired combined cycle generating facility at the proposed site in Brockton, Massachusetts.

I. INTRODUCTION

A. Description of Proposed Project, Site, and Interconnections

Brockton Power, LLC ("Company" or "Brockton Power") has proposed to construct a nominal 270 megawatt ("MW"), gas-fired, combined-cycle, electric generating facility in the City of Brockton, Massachusetts ("Brockton Power Project") (Exh. BP-1, at 1-1). The project would be located on a 13.2 acre parcel of land adjacent to the City of Brockton's Advanced Water Reclamation Facility ("AWRF") (id.). Both the proposed project site and the AWRF are within the 70 acre Oak Hill Industrial Park in the southeastern corner of the City of Brockton ("Brockton") (Exh. BP-1, at 1-1). The project site is bounded by the Salisbury Plain River to the west and the AWRF property to the south (id. at, 1-11). To the north and east, the site is surrounded by commercially and industrially zoned properties which are currently occupied by warehouses and manufacturing facilities (id. at 1-12, 4.2-1).

The primary components of the proposed project are based on Asea Brown Boveri ("ABB") GT-24 generation technology and would include a gas combustion turbine, a heat recovery steam generator ("HRSG"), a steam turbine, and a single electrical generator which would be driven by both the combustion turbine and the steam turbine (id. at 1-18). The Company stated that to maintain reliability during potential gas supply contingencies, the proposed project would also have the ability to burn low-sulfur No. 2 distillate fuel oil for up to 720 hours (30 days) per year (id. at 1-1, 1-19). Cooling for the proposed facility would be provided by a six-cell wet mechanical cooling tower (id. at 1-1). The project would use approximately 1.6 million gallons per day ("mgd") of water for cooling tower makeup and for process water (id.). The Company proposes to use treated effluent obtained from the AWRF to meet the cooling and process water needs of the project (id. at 1-1, 1-18, 1-22). Additional facilities associated with the project include a

115 kilovolt ("kV") switchyard, water treatment facilities, water storage tanks, and a fully-diked 500,000 gallon fuel oil storage tank, as well as offsite gas and electrical interconnections (id.).

Natural gas for the project would be transported to the site via a new 1800 foot lateral pipeline from Algonquin Gas Transmission Company's ("AGT") pipeline (id. at 1-24). The lateral pipeline would run north from the project site along Industrial Boulevard to interconnect near the intersection of Oak Hill Way near Sargent's Way (id.). For electrical transmission, the project would interconnect with the Eastern Utilities Associates ("EUA") 115 kV transmission line, which runs to the south of the project site via a new 3500 foot 115 kV line (Exhs. HO-RR-20 (a) and (b) (att.); EFSB-EL-11; Tr. 1 at 126). The preferred interconnection route would run east from the site along Oak Hill Way, continue southward along Oak Hill Way, then eastward along the southern edge of a developed parcel owned by Campanelli et al. Trust, and finally south along the Massachusetts Bay Transit Authority ("MBTA") railroad right-of-way ("ROW") to the EUA transmission lines (id.).[(1)]

The proponent for the Brockton Power Project, Brockton Power, LLC, is a limited liability company that was established specifically for the development of the proposed project (Exh. EFSB-B-1). Although the project is the Company's first, the Company states that its principals and participants have considerable experience in the development of generating facilities in Massachusetts, Connecticut, and New York (Exhs. EFSB-B-1; BP-1, at 1-43).[(2)]

B. Procedural History

On January 11, 1999, Brockton Power filed with the Siting Board[(3)] a petition to construct and operate a gas-fired, combined-cycle generating facility with a net nominal capacity of approximately 270 MW in Brockton. The Siting Board docketed the petition as EFSB 99-1.

On February 24, 1999, the Siting Board conducted a public hearing in Brockton. At the direction of the Hearing Officer, the Company provided notice of the public hearing and adjudication.[(4)]

A timely petition to intervene was filed by Tofias Trust. Timely petitions to participate as interested persons were filed by: U.S. Generating Company ("USGen"); American National Power, Inc. ("ANP"); and Sigma Consultants, Inc. on behalf of Sithe Energy, New England ("Sithe"). Brockton Power filed an opposition to the petition to intervene of Tofias Trust. Brockton Power did not oppose the petitions to participate of USGen, ANP or Sithe.

The Hearing Officer denied the petition to intervene filed by Tofias Trust and, in the alternative, allowed Tofias Trust to participate as an interested person. Brockton Power, LLC, EFSB 99-1, Hearing Officer Procedural Ruling, April 8, 1999, at 7.[(5)] The Hearing

Officer granted the petitions to participate as interested persons of USGen, ANP and Sithe (Id.).

The Siting Board conducted two days of evidentiary hearings, commencing on

July 6, 1999 and ending on July 8, 1999. The Company presented the testimony of the following witnesses: Kevin O'Reilly, Communications Director and Project Manager of the Point Group, who testified as to the Company's site selection process; George W. Baldwin, President and Managing Partner of Brockton Power, who testified as to the Company's site selection process; Theodore A. Barton, P.E., Managing Principal of Epsilon Associates, Inc., who testified as to the Company's project description, site selection, technology performance standards, environmental issues and mitigation and environmental policies; Dale T. Raczynski, P.E., Principal of Epsilon Associates, Inc., who testified as to air quality issues; Peter A. Valberg, Ph.D., Senior Scientist at Cambridge Environmental, Inc., who testified as to electrical and magnetic fields ("EMF") and health issues; Andrew D. Magee, Senior Project Manager at Epsilon Associates, Inc., who testified as to water resources, wetlands and traffic issues; and Douglas L. Sheadel, Principal

Scientist of Modeling Specialties; and David N. Keast, P.E., Consultant in Acoustics, who testified as to sound modeling and noise issues.

On July 28, 1999, Brockton Power and Tofias Trust submitted their initial briefs and on August 4, 1999 Brockton Power and Tofias Trust submitted their reply briefs. Tofias Trust submitted corrections to its initial brief on August 5, 1999.[(6)] The record consists of 165 exhibits consisting primarily of information request responses and record request responses.

C. Scope of Review

1. Background

On November 25, 1997, the Governor signed into law Chapter 164 of the Acts of 1997, entitled "An Act Relative to Restructuring the Electric Utility Industry in the Commonwealth, Regulating the Provision of Electricity and Other Services, and Promoting Enhanced Consumer Protection Therein" ("Restructuring Act"). Sections 204 and 210 of the Restructuring Act altered the scope of the Siting Board's review of generating facility proposals by amending G.L. c. 164, § 69H and by adding a new section, G.L. c. 164, § 69J¼, which sets forth new criteria for the review of generating facility cases.

On March 19, 1999, the Siting Board issued a request for comments on Siting Board staff's draft standards of review for generating facility cases ("Request for Comments").

The draft standards of review addressed the four major elements of the generating facility review set forth in G.L. c. 164 §§ 69 H and 69J¼: the site selection process, the environmental impacts of the proposed facility, consistency with the policies of the Commonwealth, and the generating technology comparison (required only in cases where the expected emissions from a proposed generating facility exceed the levels specified in 980 CMR 12.03).

In its Request for Comments, the Siting Board stated that parties in pending generating facility cases would have an opportunity to brief the standards of review to be applied in their specific case (Request for Comments at 2). On June 14, 1999, staff issued revised standards of review. On July 15, 1999, parties and interested persons in EFSB 99-1 were invited to submit comments on both versions of the standards of review. Brockton Power, LLC, EFSB 99-1, Hearing Officer Memorandum, July 15, 1999.

2. Position of the Company

Brockton Power stated that in its opinion, the Siting Board staff's revised standards of review accurately set forth the changes required by the Restructuring Act (Company Initial Brief at 8, n. 7). The Company also stated that its application, as filed, fulfills the requirements of the Restructuring Act and is wholly consistent with revised standards of review issued by Siting Board staff (id.). In response to the argument raised by Tofias Trust that staff's standards of review are flawed because they do not specifically allow for the review of EMF impacts, the Company stated that, in this case, the Siting Board has followed its traditional approach of reviewing EMF impacts and that the record provides an "expansive basis" for the Siting Board to evaluate such impacts (Company Reply Brief at 1, n. 1).

3. Position of Tofias Trust

Tofias Trust stated that the staff's draft standards of review are flawed (Tofias Trust Initial Brief at 1). Specifically, Tofias Trust stated that the draft standards are silent relative to EMF impacts and that, to the extent the standards reject consideration of EMF impacts, the standards are contrary to statute (id.). Tofias Trust argued that since the Restructuring Act eliminated the need analysis but retained the mandate that a proponent show minimization of environmental impacts, the legislature intended to ratify the scope of the Siting Board's prior environmental review, which has routinely included a review of EMF impacts (id. at 3). Further, Tofias Trust argued that the Siting Board must review EMF impacts because G.L. § 69 J¼ specifically requires the Siting Board to review "radiation" impacts and "transmission lines emit and propagate electric and magnetic fields, and thus produce 'radiation' within the meaning of

§ 69J¼ (id. 4-5)."

4. Analysis

As an initial matter, the Siting Board notes that the purpose of its standards of review is to set forth the statutory requirements that govern its decisions, and to provide broad guidance as to how it interprets those requirements, so that all parties to a proceeding have a clear understanding of the scope of the proceeding.

With respect to EMF impacts, we note that G.L. c. 164, § 69J¼ does not specifically enumerate EMF impacts as a discrete area of review in generating cases.[(7)] Because the standard of review is intended to provide broad guidance consistent with the Siting Board's statute, we will not alter the list of specific environmental impacts which must be reviewed by adding EMF impacts. However, as a matter of practice, the Siting Board examines all relevant environmental impacts, not just those enumerated in its statute, in order to ensure that it fulfills its mandate to minimize environmental impacts consistent with the minimization of costs associated with the mitigation, control, and reduction of the environmental impacts of the proposed generating facility.[(8)] Because electric generating facilities frequently have associated electrical transmissions lines, the Siting Board has historically reviewed the EMF impacts of transmission lines when assessing the environmental impacts of generating facilities. In cases that have been issued after the Restructuring Act, the Siting Board has continued to review EMF impacts to determine whether a project proponent has minimized environmental impacts. IDC Bellingham LLC, EFSB 97-5 (1999) ("IDC Bellingham Decision"); Sithe Edgar Development LLC, EFSB 98-7, at 106 (2000) ("Sithe Edgar Decision"); Sithe Mystic Development LLC, EFSB 98-8, at 71 (1999) ("Sithe Mystic Decision"). The Siting Board sees no reason to change its long-standing practice of reviewing EMF impacts in this decision. We note that neither the draft standards nor the revised standards of review issued by Siting Board staff preclude a review of EMF impacts. Consequently, in addition to the environmental impacts enumerated in G.L. c. 164, 69J¼, the Siting Board here reviews the EMF impacts of transmission interconnections associated with the proposed generating facility.

Accordingly, the Siting Board finds that the revised standards of review with respect to the site selection process, environmental impacts, and consistency with the policies of the Commonwealth issued on June 14, 1999, comply with the requirements of G.L. c. 164, §§69H and J¼ and will govern the scope of review in this proceeding.[(9)],[(10)]

In Section II, below, the Siting Board considers the Company's site selection process; in Section III, below, the Siting Board considers the environmental impacts of the proposed facility, including EMF impacts; and in Section IV, below, the Siting Board addresses whether the plans for construction of the proposed 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 Siting Board.[(11)]

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 a petitioner's site selection process shall include a complete description of the environmental, reliability, regulatory, and other considerations that led to the applicant's decision to pursue the project as proposed at the proposed site, as well as a description of other siting and design options that were considered as part of the site selection process.

The Siting Board also is required to determine whether a proposed facility provides a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. G.L. c. 164, § 69H. To accomplish this, 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. The Siting Board therefore will review the applicant's site selection process in order to determine whether that process contributes to the minimization of environmental impacts of the proposed project and the costs of mitigating, controlling, and reducing such impacts. In making this determination, the Siting Board also will consider, consistent with its broad mandate under G.L. c. 164, § 69H, the reliability, regulatory, and other non-environmental advantages of the proposed site.

B. Description

Brockton Power indicated that its site selection process was developed to identify a site with attributes which would allow the proposed project to compete effectively in an electric generation marketplace while resulting in minimum impact on the environment (Exh. BP-1, at 2-2 to 2-3). The Company stated that its siting process was specifically designed to: (1) identify a reasonable universe of site alternatives; (2) apply appropriate evaluation criteria to such sites; and (3) select the site that would result in the minimum environmental impact at the least cost and would maximize opportunities to supply reliable, competitively priced electricity (id.).

Brockton Power stated that it initially limited the search for a suitable project to Massachusetts because the state's energy facility licensing process recognizes the competitive nature of the electric generating market (Exh. BP-1, at 2-3). The Company indicated that the extensive prior experience of its project team in developing generating facilities within Massachusetts contributed to the Company's decision to focus on the state (id.). The Company also asserted that a competitive market and a solid economy in the region favor development (id.). The Company indicated that it focused its search on sites in southeastern Massachusetts due to the limited number of proposals to develop energy facilities in that area (Tr. 1, at 36). Finally, the Company indicated that the interest expressed by Brockton officials in having a generating facility developed within the city was a factor in further narrowing the search area for a project site (id. at 2-6; EFSB-S-4).

Brockton Power stated that it identified six potential sites in the Southeastern Massachusetts area: Site 1, Site 2, and Site 3 in Brockton, and individual sites in Taunton, New Bedford, and Plymouth (id.). The Company performed an initial examination of the six potential sites to assess site availability and to determine consistency with site evaluation criteria including: (1) proximity to electric transmission; (2) proximity to a gas pipeline; (3) community acceptance; (4) water supply; (5) site size and buffer; (6) waste water discharge; (7) proximity to sensitive receptors; (8) zoning and land use; (9) wetlands; (10) location of a site within one municipality; (11) at least 10 acres of industrial land suitable for building; and (12) manageable road access, such as proximity to a highway (Exhs. EFSB-S-5; BP-1, at 2-4). The Company stated that perhaps the most important consideration for siting a new generating facility was community acceptance (Exh. BP-1, at 2-3). The Company also indicated that proximity to natural gas supplies and electric transmission lines was imperative for developing an economically viable facility with minimum environmental impacts, and that it also considered close proximity to an adequate water supply for cooling to be a priority (id.). The results of Brockton Power's site evaluation are shown in Table 1, below.

The Company's initial analysis indicated that three of the potential sites - the Taunton, New Bedford, and Plymouth sites -- would require extensive upgrades to existing gas pipelines (Tr. 1, at 44 - 45; BP-1, at 2-7).[(12)] The Company's analysis further indicated that Brockton Site 1 posed concerns with respect to the extent of wetlands and proximity to sensitive receptors, while Brockton Site 2 is occupied by extensive wetlands and lacks sufficient suitable upland area for development (Tr. 1, at 21-33; Exh. EFSB-S-5, at 2). Finally, the Company determined that the Taunton and New Bedford sites were not available for development, and stated that the owner of Brockton Site 1 was reluctant to negotiate an agreement with the Company (Tr. 1, at 21-33;

BP-1, at 2-7).

Based on its initial analysis, the Company concluded that the lack of favorable access to gas supplies and questionable availability for development were fatal flaws for the New Bedford and Taunton sites (Exhs. BP-1 at 2-7; Tr. 1, at 33-34). The Company also indicated that although the Plymouth site had appropriate zoning, community support,

and adequate land, the insufficient capacity of the gas pipeline serving Plymouth constituted a fatal flaw for this site (id.).

Table 1.

Criteria	Brockton Site 1	Brockton Site 2	Brockton Site 3	Taunton Site	Plymouth Site	New Bedford Site
1) Proximate to Transmission Lines	Yes	Yes	Yes	Yes	Yes	Yes
2) Proximate to Gas Pipeline	Yes	Yes	Yes	No	No	No
3) Community Acceptance	Yes/No[1]	Yes[4]	Yes	Unknown	Unknown	Yes
4) Water Supply	Yes	Yes	Yes	Yes	Unknown	Unknown
5) Site Size and Buffers	Yes/No[2]	No	Yes	Yes	Yes	Yes
6) Wastewater Discharge	Yes	Yes	Yes	Yes	Unknown	Unknown
7) Proximity to Sensitive Receptors	Yes/No[2]	Yes	Yes	Yes	Yes	Yes
8) Zoning/Land Use	Yes	Yes	Yes	Yes	Yes	Yes
9) Wetlands	Yes/No[2]	No	Yes	Yes	Unknown	Yes
10) Entire Site Within One Municipality	No[3]	Yes	Yes	Yes	Yes	Yes
11) 10 Acres of Buildable Industrial Land	Yes	No	Yes	Yes	Yes	Yes
12) Road Access	Yes	Yes	Yes	Yes	Yes	Yes

1 The site has general community acceptance but the owner showed a reluctance to negotiate a purchase agreement (Exh. EFSB-S-5).

2 The site is large site but there is concern about the amount of wetlands and proximity of sensitive receptors (Exh. EFSB-S-5).

3 The site includes land in both the City of Brockton and the Town of West Bridgewater (Exh. EFSB-S-5).

4 A "Yes/No" designation was inadvertently indicated in Exhibit EFSB-S-5 (Exh. EFSB-S-7).

Table 1 shows the results of the detailed site review performed by Brockton Power (Exh. EFSB-S-5). Yes/No indicates that site satisfied siting criteria in some aspects but not in others.

Brockton Power performed a more detailed evaluation of Brockton Sites 1, 2, and 3, all of which are within the Oak Hill Industrial Park located in the southeastern corner of Brockton (id.; HO-RR-1).[(13)] First, to gauge local support for the project, the Company held a community meeting near the Oak Hill Industrial Park (Exh. EFSB-S-4). The Company indicated that it also contacted local elected officials and maintained continuous outreach with Brockton City officials and community activists from the early stages of the development process (id.). Brockton Power determined that Site 3 best met the project selection guidelines, including: (1) proximity to gas and electrical interconnections; (2) strong community support; (3) adequate size to minimize environmental impacts; (4) close proximity to a water supply (AWRF); (5) adequate distance from sensitive receptors; (6) appropriate zoning for a generation facility; and (7) sufficient development area outside of wetlands and protection zones (id. at 2-7 to 2-8).

To support its choice of site, the Company provided the Siting Board with a quantitative comparison of Brockton Sites 1, 2, and 3 (Exh. HO-RR-1). In this analysis, the Company ranked the sites based on location, lot size, price, visibility, accessibility, image, proximity to other businesses, site utility, zoning, water treatment, municipal sewer, environmental issues, and permitting issues (id.). The Company assigned a score between 1 and 10 to each site for each

category, with 10 signifying "Best" and 1 corresponding to "Poor" (id.). The Company argued that the site with the highest total scores was, overall, the most suitable site for the proposed project (id.). In a one-to-one comparison, the Company indicated that Brockton Site 3 was as good as or superior to each of the other Brockton sites for almost all siting criteria (Tr. 1, at 21-33). The Company supported this finding through the results of its quantitative analysis, in which Site 3 received a score of 128 out of a possible 130, while Site 2 scored only 108 and Site 1 scored 103 (id.).[(14)]

C. Analysis

The Company presented a site selection process which led to the choice of Brockton Site 3, located within the City of Brockton's Oak Hill Industrial Park. The Company indicated that it focused its site selection process in southeastern Massachusetts due to a combination of the favorable regulatory structure for new energy facilities, regional economic factors, and local community interest. Brockton Power described a set of siting goals which included: (1) location in an area of developing competitive electric generation; (2) availability of infrastructure; (3) community acceptance; and (4) the ability to minimize environmental impacts. Using siting criteria that incorporated these siting goals, Brockton Power outlined its method for evaluating the six sites identified in its petition. This analysis included the Company's description of fatal flaws attributed to the New Bedford, Taunton, and Plymouth sites and an objective ranking and comparison of the three Brockton sites. The Company indicated that the evaluation demonstrates the superiority of Site 3 relative to the other identified sites. The Siting Board finds the applicant's description of the process used for site selection is accurate.

Some of the specific criteria in the Company's site selection process were site size and buffer, proximity to sensitive receptors, extent of on-site wetlands, proximity to road access, and land use and zoning. These criteria are directly related to minimization of environmental impacts including noise, visual, traffic, land use, and water related impacts. The balance of the Company's specific siting criteria included proximity to electric transmission and gas transmission, water supply, and waste water discharge facilities. These criteria minimize the cost associated with the proposed project, but also tend to minimize the environmental impacts of the project by minimizing disturbances associated with construction of ancillary facilities.[(15)]

Application of the siting criteria outlined above led to the Company's identification of a proposed project site that is within an area zoned for heavy industry and is currently surrounded by industrial and commercial land uses which would serve as a buffer between the proposed facility and sensitive receptors. The siting criteria allowed for the identification of a site that has minimal wetlands and is proximate to a gas pipeline, electric transmission lines, water supply, and waste water treatment facilities. Accordingly, the Siting Board finds that the Company's site selection process resulted in the choice of a site that contributes to the minimization of environmental impacts and the costs of mitigating, controlling, and reducing such impacts.

III. 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, including 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. 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 agencies' standards does not establish that a proposed facility's environmental impacts have been 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 both among conflicting environmental concerns and between environmental impacts and cost. A facility proposal which 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 Quality

This section describes the project's proposed emissions and impacts, compliance with existing regulations, proposals for emissions offsets, and mitigation proposed by the Company.

1. Applicable Regulations

Brockton Power indicated that the air emissions from the proposed project are subject to regulation by the United States Environmental Protection Agency ("EPA") and the Massachusetts Department of Environmental Protection ("MDEP") (Exh. BP-1, at 4.6-1). The applicable regulations include: National Ambient Air Quality Standards ("NAAQS"); Massachusetts Ambient Air Quality Standards[(16)] ("MAAQS"); Non-Attainment New Source Review ("NSR") requirements; Prevention of Significant Deterioration[(17)] ("PSD") requirements; and New Source Performance Standards

("NSPS") (id.). All of these regulations apply to six criteria air pollutants: sulfur dioxide ("SO_2"), nitrogen oxides ("NO_X"), particulates[(18)] ("PM-10"), carbon monoxide ("CO"), ozone ("O_3"), and lead ("Pb") (id. at Table 4.6-1). The PSD also covers several additional pollutants (id. at Table 4.6-1).[(19)] The requirements of the air regulations are reviewed and administered through the MDEP's Air Plans Approval Process (id. at 4.6-5).

Brockton Power noted that NAAQS and MAAQS specify limits for the atmospheric concentration of criteria pollutants (id. at 4.6-3). The Company indicated that the federal and state air pollution regulations are intended to ensure that ambient air quality (which would include background and any new or existing sources) is in compliance with the NAAQS and MAAQS (id.). With respect to these air quality standards, EPA has classified each region of the country as "attainment", "non-attainment", or "unclassified" (id.). If an area is classified as "attainment" or "unclassified" for a particular pollutant, then a PSD review is required for pollutants with projected emissions rates that exceed a specified PSD threshold (Exh. EFSB-1, at 3.1-2). The PSD review requires that NAAQS and MAAQS standards be met and that Best Available Control Technology ("BACT") be used for any new source of pollutant emissions projected to exceed specified PSD Significant Emission Rates (id.). If an area is classified as "non-attainment" for a pollutant and a facility would be a major source of that pollutant, then EPA requires a non-attainment NSR (Exh. BP-1, at 4.6-3)

The Company indicated that Plymouth County, which includes Brockton, currently is "unclassified" for all criteria pollutants except O_3 (id.). The Company indicated that the entire Commonwealth of Massachusetts is classified as serious non-attainment for ozone (id. at 4.6-1). Therefore, the Clean Air Act (42 U.S.C. §7511 (f)) requires a NSR for new major sources of volatile organic compounds ("VOCs") and NO_X emissions, which are chemical precursors to O_3 (id.).

The Company noted that, to identify new pollution sources that may significantly affect air quality, EPA and MDEP have established Significant Impact Levels ("SILs") for criteria pollutants (id. at 4.6-3). New sources that would result in modeled ground level concentrations which exceed SILs are required to perform air quality modeling that specifically includes measured background levels of pollutants and emissions from both the proposed new source and existing interactive sources (id.). For new combustion sources, the EPA has also established NSPS, which specify fuel quality and/or allowable concentrations of pollutants in exhaust gas for a given combustion process (id. at 4.6-4). The Company indicated that both the exhaust emissions (2.0 ppmvd during gas firing and 6 ppmvd during oil firing) and the fuel sulfur concentrations (0.01 percent for gas, 0.05 percent for oil) of the proposed facility would be well below the NSPS (Exh. HO-RR-4, at 3-6).

In addition to the various EPA and MDEP regulations outlined above, the proposed project must satisfy the requirements of the Siting Board's Technology Performance Standards ("TPS") regulations (980 CMR 12.00), either by limiting emissions of six criteria pollutants and 16 non-criteria pollutants to levels stated in the regulations, or by providing an analysis of alternative generating technologies. Brockton Power submitted

information demonstrating that emissions from the proposed project would be equal to or less than those stipulated in 980 CMR 12.00 for all criteria pollutants and non-criteria pollutants (Exh. BP-1, at 3-2 to 3-3).[(20)]

2. Emissions and Impacts

Brockton Power asserted that the proposed project would have a beneficial effect on regional air quality and that its effect on local air quality would be insignificant (id. at 4.6-1).

To evaluate the air quality impacts of potential air emissions, Brockton Power modeled maximum ground level concentrations for criteria pollutants (id. at 4.6-12 to 4.6-26; EFSB-E-1 at 3.1-4 to 3.1-9). In its analysis, the Company used the SCREEN3 and ISCST3 air modeling software[(21)] and assumed a stack height of 185 feet (id.).[(22)] The Company also assumed a full 720 hours of oil firing during one year of continuous facility operation at a worst-case load rate for each pollutant (Exh. EFSB-E-1 (Table 3.1-1)).[(23)] The Company indicated that although the proposed generating facility would be natural gas fueled, it would be capable of firing distillate fuel oil for a maximum of 720 hours (30 days) a year (Exh. EFSB-E-1, at 3.1-5).[(24)] The Company stated that during a normal year, it would expect to operate using oil for 24 to 48 hours, and that, based upon operating experiences at other dual-fuel plants, it is not likely the facility would need to operate continuously on oil for more than 48 hours (Exh. EFSB-T-4; Tr. 1, at 66 - 67).

Brockton Power's SCREEN3 modeling results established that air quality effects of the proposed project would be lower than all SILs except for 24-hour average SO_2 and 24-hour average PM-10 (Table 3) (id.). The Company indicated that it used the ISCST3 air quality modeling program to more accurately evaluate potential ground level concentrations of SO_2 and PM-10 (Exh. BP-1, at 4.6-24 to 4.6-26; EFSB-E-1, at 3.1-6 to 3.1-9). The Company's results from the ISCST3 modeling demonstrated that the ground level concentrations of 24-hour average SO_2 and 24-hour average PM-10 emissions would be less than SIL's, even under the worst-case load emissions rate (Table 3) (Exh. EFSB-T-4; Tr. 1, at 66-67).

The Company presented a comparison of the calculated emissions with PSD Significant Emission Rates and with Non-attainment NSR threshold criteria (id.). The Company's comparison showed that emissions of sulfuric acid mist, CO, NO_X, SO_2, PM, and PM-10 would exceed the PSD Significant Emission Rates (Table 2) and that the project would therefore be required to achieve BACT [(25)] for these pollutants (id. at 3.1-2). The Company's comparison also showed that annual NO_X emissions exceed the non-attainment NSR threshold criteria (id. (Table 3.1-1)). Therefore, the Company stated that a NSR and Lowest Achievable Emission Rate[(26)] ("LAER") technology would be required for NO_X (id. at 3.1-2). The Company noted that, because the proposed facility's

expected emissions of VOCs would not exceed the 50 ton per year ("tpy") NSR threshold, an NSR and LAER for VOCs would not be required (Exh. BP-1, at 4.6-3).

Table 2.

Pollutant	**Maximum Potential Emissions[1] (tpy)**	**PSD Significant Emissions Rate (tpy)**	**Non-attainment NSR Threshold Criteria (tpy)**
Carbon Monoxide (CO)	202	100	N/A
Nitrogen Oxides (NOx)	73	40	50
Particulate Matter	131	25	N/A
PM-10	131	15	N/A
Volatile Organic Compounds (VOCs)	22	40	50
Lead (Pb)	0.05	0.6	N/A
Sulfur Dioxide (SO2)	66	40	N/A
Sulfuric Acid Mist	20	7	N/A

1 Maximum potential emissions using worst case load emission rate of each pollutant for 8,040 hours of natural gas use and 720 hours of oil use as well as any cooling tower emissions.

Table 2. Maximum Potential Emissions of major pollutants for the Brockton Power project with PSD Significant Emission Rates and Non-Attainment Threshold Criteria (Exh. HO-RR-4 (Table 3.1-1)).

Table 3.

Pollutant	**Averaging Period**	**Modeled Maximum Concentration (g/m^3)**	**Significant Impact Levels (g/m^3)**	**Modeling Parameters**
NO_2	Annual	0.43 (SCREEN3)	1	75% Load, Gas 0F, 8040 hrs 75% Load, Oil 100F, 720 hrs
SO_2	3-Hour	24.2	25	75% Load, Oil, 100F

		(SCREEN3)			
		24-Hour	4.32 (ISCST3)	5	75% Load, Oil, 100F
		Annual	0.31 (SCREEN3)	1	75% Load, Gas 0F, 8040 hrs 75% Load, Oil 100F, 720 hrs
PM-10	24-Hour	4.15 (ISCST3)	5	75% Load, Oil, 100F	
		Annual	.87 (SCREEN3)	1	50% Load, Gas 100F, 8040 hrs 75% Load, Oil 100F, 720 hrs
CO	1-Hour	25.81 (SCREEN3)	2000	50% Load, Gas, 0F	
		8-Hour	18.06 (SCREEN3)	500	50% Load, Gas, 0F

Table 3. Significant Impact levels and modeled ground level concentrations for criteria pollutants of which the project would be a major source (Exh. HO-RR-4, (Table 6.3-2), (Table 6.5-1)). Listed concentrations were calculated using the SCREEN3 program with Simple Terrain parameters, except 24-hour average SO_2 and 24-hour average PM-10 which were recalculated using the more refined ISCST3 model (id.).

Because the proposed facility's modeled emissions were below SILs for all pollutants, the Company was not required to conduct interactive emissions analysis (Exh. BP-1, at 4.6-3). However, the Company indicated that the three largest existing emitters of air pollutants in Brockton and adjacent municipalities are the Browning Ferris Industries ("BFI") East Bridgewater waste disposal facility, the Veterans Administration ("VA") Medical Center, and Whitman Castings (Exh. EFSB-H-10). The Company indicated that the recently reported major emission of criteria pollutants from these facilities were: 133 tpy of CO, 36 tpy of NO_2, and 14 tpy of VOC from BFI; 119 tpy of SO_2 and 42 tpy of NO_2 from the VA Medical Center; and 72 tpy of CO from Whitman Castings (id.). The Company also submitted information indicating that these emitters were from 1.5 to 4.75 miles from the proposed site (id.). The Company argued that the potential for interactive effects between nearby major emitters and the proposed facility would be very small due

to the distance of the emitters from the proposed project and the relatively limited total quantities of emitted pollutants from these facilities (id.; Tr. 1, at 153-154).

Brockton Power indicated that the ISCST3 modeling was also used to predict the ground level concentration limits of air toxic pollutants (Exh. HO-RR-4, at 6-12 to 6-13 (att.)). The Company modeled the 24-hour average concentration for gas and for oil firing as well as an annual average concentrations assuming 720 hours of oil firing and 8040 hours of gas firing (id.). The Company indicated that the predicted concentrations would be lower than TELs and AALs established by the MDEP (id.).

Due to its proposed use of treated effluent for cooling tower makeup water, Brockton Power also submitted a discussion of potential odors and airborne impurities associated with the wet mechanical cooling towers (Exhs. EFSB-EU-7; EFSB-EU-8). The Company indicated that the effluent used in the cooling towers would be treated and disinfected by the Brockton AWRF and also treated at the proposed facility, so this water would be clean and essentially odor free (id.). Furthermore, the Company indicated that the facility would be equipped with drift eliminators which would minimize emission of liquid from the cooling towers (id.).

3. Emission Mitigation and Offsets Proposals

As discussed in Section III.A.2 above, the proposed facility would be required to achieve BACT for all of the criteria pollutants and LAER for NO_X. Additionally, the Company indicated that BACT requirements would be applied to other pollutants that exceed the PSD Significant Emissions Rate, specifically PM and sulfuric acid mist (Exh. EFSB-E-1, at 3.1-2).

Brockton Power indicated that it would achieve BACT through: (1) use of efficient and controlled combustion in an advance turbine to reduce or minimize emissions of CO, VOC, PM, and PM-10; (2) use of an oxidation catalyst to reduce CO; and (3) use of natural gas and low sulfur fuel oil to minimize sulfuric acid mist, SO_2 and PM-10 emissions (Exhs. BP-1, at 4.6-5 to 4.6-11; EFSB-E-1, at 3.1-2 to 3.1-6). To achieve LAER, the Company proposed the use of dry low-NO_X combustion and enhanced Selective Catalytic Reduction ("SCR") technology[(27)] which would result in an average NO_X emissions rate of 2.0 ppmvd during gas firing (Exh. HO-RR-4, at 3-6). For oil firing, the Company indicated that water injection and SCR would constitute LAER technology and would result in an average NO_X emissions rate of 6 ppmvd (id.).

Brockton Power argued that the proposed project would have regional air quality benefits due to required NO_X offsets (Exh. BP-1, at 4.6-1). Specifically, the Company indicated that it would be required to offset its expected NO_X emissions at a rate of 1.26 to 1.0 (id.). The Company stated that its offsets would amount to 93 tpy and would have to be obtained from within Massachusetts or from a non-attainment area of at least equivalent

severity which contributes to ozone non-attainment in Massachusetts (Exh. EFSB-E-1, at 3.1-4). The Company stated that appropriate NO_X offsets would be obtained from brokers prior to finalization of MDEP's approval of the facility's air plan (id.).

Brockton Power also indicated that, under 40 CFR Part 72, the proposed project would be designated as a Phase II Acid Rain "New Affected Unit" and that, as such, the proposed facility would be required to obtain allowances to offset potential SO_2 emissions (Exh. BP-1, at 4.6-4). The Company stated that these allowances can be purchased through the Chicago Board of Trade; however, it did not specify any procedures or plans for securing SO_2 allowances.

Brockton Power estimated that the facility's maximum potential emissions of CO_2 would be 952,209 tpy (Exh. BP-1, at 4.6-12). The Company indicated that it would develop a plan for obtaining offsets, consistent with Siting Board precedent (id.).

Brockton Power also provided an analysis of the potential air quality benefits that would result from the proposed project if generation capacity at currently operating marginal generation facilities were displaced by the proposed project (Exh. EFSB-EA-1). The Company used data from ISO-New England's 1997 Marginal Emission Rate Analysis to calculate the quantity of NO_X, SO_2, and CO_2 emissions that would result from marginal facilities producing 265 MW of electric generation for 92 percent of the year (the estimated availability of the proposed facility) (id.). In its analysis, the Company indicated that emissions from a marginal facility would be 2,776 tpy for NO_X, 9931 tpy for SO_2, and 1,584,680 for CO_2 but that the proposed facility, for the same availability and generation capacity, would produce only 67 tpy of NO_X (2.4 percent), 59 tpy of SO_2 (0.6 percent), and 876,032 of CO_2 (55 percent) (id.). Therefore, the Company argued that the proposed project would result in a 2709 tpy net decrease in regional NO_X emissions and net reduction in regional SO_2 and CO_2 emissions of 9,872 tpy and of 708,648 tpy respectively (id.).

4. Analysis

The record shows that the proposed facility would consist of a combustion turbine primarily fueled with natural gas but permitted to use distillate fuel oil as a backup fuel source for up to 720 hours per year. The record also indicates that the project would include a HRSG and a steam turbine, as well as pollution control measures such as enhanced SCR, dry low NO_X firing of natural gas, an oxidation catalyst, and water injection during oil firing. The record shows that the proposed facility would achieve LAER for NO_X[(28)] and BACT for VOC, CO, PM-10, PM, SO_2, and sulfuric acid mist. The Company provided information regarding total facility emissions which demonstrates that the proposed project would meet TPS for criteria and non-criteria pollutants. Consequently, the Siting Board finds that no alternative technologies assessment is required for the proposed facility.

The Company calculated total expected air emissions from the proposed facility and used appropriate and reasonable air modeling techniques to estimate the expected air quality impact of potential emissions. The results of the Company's air quality impact analysis indicate that the maximum concentrations of NO_2, CO_2, PM-10, and CO emitted from the facility, at the location of maximum impact, would be between 0.064 and 2.7 percent of NAAQS. This modeling also demonstrates that the impact of the proposed facility would be less than SILs for all criteria

pollutants. The Company determined these results assuming an exhaust stack height of 185 feet, which is 15 feet below GEP stack height and thereby reduces visual impacts (see Section III.F, below). Because the modeled emissions are below SILs, the Siting Board finds that the proposed 185 foot stack height would minimize air quality impacts consistent with the minimization of visual impacts.

Brockton Power proposed to use treated sanitary wastewater in its wet mechanical cooling towers.[(29)] The record indicates that the wastewater would be treated twice before use, and therefore no odors or airborne impurities are likely to be emitted by the cooling towers. Consequently, the Siting Board finds that Brockton Power's proposed use of treated sanitary wastewater would have acceptable air quality impacts.

Brockton Power proposes to use low sulfur distillate oil as a backup fuel for a maximum of 720 hours (30 days) per year but predicted that in a normal year it would use oil for only 24 to 48 hours. The Company has stated that fuel oil would be used in the event of insufficient gas supplies and that during the ozone season (May 1 to September 30), fuel oil would be used only during a gas supply emergency. During a normal year the Company expects to use oil firing for a total 24 to 48 hours but, even under extreme circumstances, does not expect to continuously use oil firing for as long as 48 hours. Although other gas fired generating facilities have chosen not to have oil backup, the Company has proposed oil backup to preserve a fuel mix thereby enhancing the reliability of the proposed facility. The Siting Board recognizes that the ability for some facilities to have fuel options is imperative for the reliability of electric supply in the event of a contingency affecting regional gas supplies. It is also important to note that air emissions from the proposed facility, modeled with a full 30 days of oil firing, have emission levels below SILs.

In the Dighton Power Decision the Siting Board set forth a new approach to the mitigation of CO_2 emissions that required generating facilities to make a monetary contribution, within the early years of facility operation, to one or more cost-effective CO_2 offset programs, with such program(s) to be selected in consultation with the Siting Board Staff. Dighton Power Associates, 5 DOMSB 193, at 3 (1997)("Dighton Power Decision").[(30)] In the Dighton Power Decision, the Siting Board expressed an expectation that the contribution of future project developers would reflect the approach set forth in Dighton, which was determined as an offset based on one percent of annual facility CO_2 emissions, at $1.50 per ton, to be donated in the early years of facility operation. Id. at 43.

Here, consistent with its rulings in recent cases, the Siting Board directs the Company to make a monetary contribution to cost-effective CO_2 mitigation programs of an amount that reflects the proposed facility's annual CO_2 emissions of 952,209 tpy over 20 years of operation. Based on the projected maximum annual CO_2 emission and assuming distribution in five annual installments, the contribution requirements would total $303,322, when adjusted for cost increases.[(31)] Therefore, the Siting Board requires the Company to provide $303,322 to be paid in five annual installments during the first five years of facility operation, to a cost effective CO_2 offset program or programs to be selected in consultation with the staff of the Siting Board. Alternatively, the Company may elect to provide a single contribution of $246,888 by the end of the first year of facility operation.[(32)]

Based on the above, the Siting Board finds that, with the condition set forth above, the environmental impacts of the proposed facility would be minimized with respect to air quality impacts.

C. Water Resources

The following section describes the water resource impacts of the proposed facility, possible alternatives to mitigate impacts, and the cost and benefits of any alternatives.

1. Description

Brockton Power divided its proposed water use into four categories: (1) cooling water; (2) process water; (3) injection water; and (4) potable water (Exh. BP-1 at, 1-22, 1-25). The Company indicated that the cooling water that is necessary to dissipate waste heat from the steam turbine and ancillary systems would be, by far, the largest water use at the proposed facility (Exh. BP-1, at 1-21 to 1-22). Specifically, the Company proposed to use an average of 1.6 mgd of treated and disinfected effluent from the Brockton AWRF as makeup water for the wet mechanical cooling towers (Exh. BP-1, at 1-1). The Company indicated that it would produce a much smaller volume of process water from effluent by filtering, demineralizing, and possibly polishing the effluent with activated carbon (Exh. BP-1, at 1-22, 1-25). The Company explained that the effluent for both cooling and process water would be obtained via a pipeline running directly from the Brockton AWRF to treatment facilities at the project site (id.).[(33)] Brockton Power stated that high-purity injection water, which is necessary for NO_X control during emergency oil firing, would be supplied from an on-site tank of previously treated water (id.). According to the Company, the stored injection water would either be treated on-site "over many days" or purchased (id.). Finally, the Company indicated that it would obtain a relatively small

volume of potable water for sanitary use from Brockton's water supply system via an interconnection with a water main on Oak Hill Way (id.).

The Company estimated that under average temperature conditions (59 Fahrenheit) the proposed facility would use 1,564,000 gallons per day ("gpd") for cooling tower makeup water and would use 15,000 gpd for process water (Exh. BP-1, at 1-22). The Company indicated that 1,368,000 gpd of the makeup water would be evaporated in the cooling towers and 196,000 gpd would be discharged to the AWRF as blowdown (id.). For higher temperature conditions (90 Fahrenheit) the Company estimated water use at 1,655,000 gpd, with 1,447,000 gpd of evaporative loss and 207,000 gpd of blowdown (id.). The Company stated that during the summer, the proposed facility would use an average of 40,000 gpd of process water and that 17,000 gpd of this amount would be used under high temperature conditions for an air inlet chilling system (id.). The Company estimated that the rate of injection water use for NO_X control during emergency oil firing would be approximately 325,000 gpd (id.). The Company estimated its potable water use would be 1000 gpd (id.).

Brockton Power indicated that, on average, its proposed consumptive water use would amount to seven percent of the effluent which the Brockton AWRF would normally discharge to the Salisbury Plain River (Exhs. BP-1, at 4.4-1; BP-2, at 5.8-1). The Company submitted data showing that, over the last three years, the average effluent discharge for the Brockton AWRF has varied from a low of 21.8 cubic feet per second ("cfs") to a high of 51.2 cfs (Exh. BP-1, at 4.4-14 to 4.4-15). The Company stated that the maximum consumptive loss associated with the proposed facility would be 2.3 cfs (1.5 mgd) (id., at 1-22). Therefore, the Company's data indicated that even under the circumstance of maximum consumptive water use and minimum waste water flow, the AWRF would discharge 19.5 cfs of treated effluent to the Salisbury Plain River (id.).

2. Potential Impacts

Brockton Power stated that flow rates in the Salisbury Plain River would not be measurably influenced by the consumptive use of effluent by the proposed facility and that all water resource uses in the Taunton River basin would be protected and preserved (Exh. BP-1, at 4.4-23). To assess the potential water resource impact of the proposed facility, the Company submitted an analysis of water resources for the Salisbury Plain River and the Taunton River basin and discussed the effect of its proposed water withdrawal on these resources (Exhs. BP-1, at 4.4-1 to 4.4-23; EFSB-EU-5; EFSB-EU-11).[(34)]

The Company described the Salisbury Plain River as a third-order tributary in the northeastern corner of the Taunton River drainage basin (Exh. BP-1, 4.4-1). The Company indicated that the confluence of Salisbury Brook and Trout Brook in Brockton forms the Salisbury Plain River, which in turn, drains into the Matfield River (id.). The Matfield River then converges with the Town River to form the main stem of the Taunton River (id.). The Company indicated that the Taunton River basin is 562 square miles in

area and that the Salisbury Plain River subbasin is only 16.7 square miles in area at the point of the AWRF discharge (id.).

Brockton Power estimated the flow volume of the Salisbury Plain River without discharge from the AWRF or the effects of other major artificial influences (i.e. natural flow) (Exh. BP-1, at 4.4-7 to 4.4-14).[(35)] The Company estimated that the mean annual natural flow of the Salisbury Plain River is 30.2 cfs, and that minimum and maximum mean annual flows are 11.8 cfs and 45.4 cfs, respectively (id. at 4.4-10). The Company also estimated the instantaneous peak flood flow of the river at 1,115 cfs and the minimum mean monthly natural flow at 0.8 cfs (id. at 4.4-10 to 4.4-12). To determine 7Q2 and 7Q10 low flow[(36)], the Company cited USGS (1984) published estimates of low flow for 44 locations in the Taunton River basin (Exh. BP-1, at 4.4-12). By comparing low flow estimates of subbasins similar in area to the Salisbury Plain River basin at the AWRF discharge, the Company estimated that the natural 7Q2 low flow for the Salisbury Plain River is approximately 1.7 cfs and that the natural 7Q10 low flow is approximately 0.6 cfs (id.).

Brockton Power identified several recommended minimum flow thresholds for the Salisbury Plain River or rivers downstream (Exhs. BP-1, at 4.4-14 to 4.4-23; EFSB-E-1, at 3.2-3 to 3.2-4). The Company presented a general recommendation from the 1991 Draft Taunton River Basin Plan suggesting a minimum flow of 2.5 cfs for the Salisbury Plain River at the AWRF (id.).[(37)] The Company also identified several resource-specific recommendations for minimum flow rates, including: (1) a minimum of 0.5 cfsm (8.4 cfs at AWRF) for Resident Fisheries in the Taunton River; (2) a minimum flow rate of 3.5 cfsm (March), 3.0 cfsm (April), and 2.5 cfsm (May) for potential Anadromous and other Marine Fisheries in the Matfield River; (3) a 3.3 to 20 cfs flow rate at the AWRF to maintain Scenic Rivers; and (4) a 1.6 to 2.4 cfs flow need at the AWRF for Municipal Water Supply purposes (id.). The Company also cited a 7Q10 based threshold of 0.6 cfs for NPDES Permits (Exh. EFSB-E-1, at 3.2-4).

Brockton Power stated that these stream flow thresholds were not "applicable" to the proposed project because the water consumed would be effluent that is diverted prior to discharge into Salisbury Plain River (Exh. EFSB-E-1, at 3.2-3). Even so, the Company submitted an analysis indicating that the proposed consumptive water use from the Brockton AWRF would not cause flow rates in the Salisbury Plain River to fall below recommended minimum flow thresholds, even under 7Q2 or 7Q10 conditions (Exh. EFSB-E-1, at 3.2-4). Using the minimum waste water flow rate of 19.5 cfs and the 0.6 cfs 7Q10 low flow conditions in the Salisbury Plain River, the Company calculated that under the worst case scenario the combined flow downstream of the AWRF would be 20.1 cfs, which is greater than all of the recommended minimum flow thresholds listed above (Exh. BP-1 at 4.4-19). The Company also emphasized that the flow of effluent from the AWRF would fluctuate far less than the natural river flow and that for five months of the year treated effluent from the AWRF would create an artificial base flow in excess of the naturally occurring flow (id.).

The Company evaluated the potential effect of its proposed water use on downstream resources, including: (1) Resident Fisheries, (2) Anadromous and other Marine Fisheries,

(3) Receiving Treated Effluent, (4) Scenic Rivers, (5) Municipal Water Supplies, and (6) Effect on Proposed Downstream Withdrawals (Exhs. BP-1, at 4.4-19 to 4.4-23; EFSB-EU-5). Brockton Power asserted that its project would not affect the ability of the other water resources to receive treated effluent because the proposed project would be using treated effluent (Exh. BP-1,

at 4.4-19 to 4.4-23). With regard to recently proposed downstream withdrawals, the Company indicated that the proposed facility's water use would have insignificant effects on the two proposed major withdrawals (City of Brockton, Taunton River Water Supply project, EOEA #8788 and Bluestone Energy Services, Regional Water Supply project, EOEA #10185) because both projects are a considerable distance downstream of the proposed facility and because the AWRF produces a higher than normal flow rate for the Salisbury Plain River basin even with the proposed water use (id.). In summary, Brockton Power asserted that the limited quantities of treated effluent used by the facility would not result in a reduction of river flow volumes of sufficient magnitude to have any adverse impact on the water resources downstream of the AWRF (id.). The Company also indicated that the proposed facility could even have a slight positive impact on water resources because, during periods of high flow, some of the wastewater that would not receive tertiary treatment would be intercepted by the project prior to discharge (id.).

The Company analyzed the potential impact of its proposed consumptive water use on the physical characteristics of rivers downstream of the Salisbury Plain River, including the Matfield River between the Satucket and Taunton Rivers, the Taunton River downstream of the Matfield River, and stretches of the Taunton River that may be particularly affected by low flow conditions (Exhs. EFSB-EU-5; EFSB-EU-11). The Company presented an evaluation from the 1997 City of Brockton Taunton River Water Supply Supplemental Draft Environmental Impact Report (EOEA No. 8788) which showed that a 15 cfs decrease in flow rate at the Mill Street Bridge on the Taunton River would result in a 1.4 inch change in river depth (Exh. EFSB-3).[(38)] By comparison, the Company indicated that the proposed facility would consume effluent at an average rate of only 2.2 cfs (Exh. BP-1, at 1-21). The Company also argued that the dimensions of rivers downstream from the AWRF would be minimally affected by the proposed consumptive water use because both the width and the depth of the Matfield and Taunton Rivers are primarily controlled by topographic factors (Exhs. EFSB-EU-5; EFSB-EU-11).

The Company estimated a 7Q10 low flow rate of 6.6 cfs for the Matfield River between the Satucket and Taunton rivers, and cited a 7Q10 low flow of 13.3 cfs in the Taunton River at the Mill Street Bridge, just downstream of Matfield River (id.). The Company's data indicate that the combined AWRF discharge and 7Q10 low flow of the Salisbury Plain River, after the proposed withdrawals, would be greater than the low flow rates cited for the Matfield or Taunton Rivers downstream from the AWRF and therefore would not lead to these rivers falling below predicted 7Q10 low flows (id.). Similarly, the

Company argued that the proposed water use would not have significant effects on the flow rate, water temperature, or water quality of the Matfield and Taunton Rivers because the maximum consumptive use represents only 10.6 percent of the effluent discharge from the AWRF during low flow periods and an even lower percentage of flow in the rivers downstream of the AWRF (id; Exh. HO-RR-16).

Brockton Power discussed water shortages in the Taunton River drainage basin (Exhs. EFSB-E-1; EFSB-EU-3; EFSB-EU-4). The Company asserted that while the Taunton River basin as a whole does not have a water supply problem, Brockton and some neighboring towns do have water supply problems as a result of their location at the headwaters of adjacent drainage basins (id). In support of this contention, the Company cited the 1991 Draft Taunton River Basin Plan, which states that "the Taunton River basin is hydrologically strong in some areas and stressed in others" but further concludes that "[t]he overall river basin and many tributaries are projected to sustain high general environmental quality even during drought conditions" (Exh. EFSB-EU-2, at 5, 6). The Company emphasized that the proposed project is not in one of six stressed subbasins in the Taunton River basin and that although there is a stressed subbasin upstream of the AWRF (Trout Brook) there are no stressed subbasins downstream (Exhs.

EFSB-E-1; EFSB-EU-3; EFSB-EU-4). The Company also cited a report entitled Strategy for Meeting the Water Supply Needs of Brockton and Other Taunton River Basin Communities Through the Year 2020, indicating that although Brockton and several surrounding towns have water supply problems, "the basin as a whole currently has adequate developed supply to meet projected demands through 2020" (id.). Although it is unclear whether the proposed consumptive water loss would reduce the water balance in the Taunton River drainage basin, Brockton Power indicated that the City of Brockton receives much of its water from Silver Lake, located in the adjacent South Coastal drainage basin (Exh. EFSB-E-1, at 3.2-2). The Company explained that, on average, Brockton receives 10 mgd from Silver Lake and speculated that if 60 percent of this water reaches the AWRF, then 6 mgd of effluent from the treatment facility represents a net basin transfer into the Taunton River basin (id.).

The Company characterized the hydrogeology of the site as dominated by well-drained stratified glacial outwash deposits which tend to readily allow water infiltration and transmission, and indicated that shallow ground water would flow westward to the Salisbury Plain River (Exhs. BP-1, at 5.8-4; 5.10-2; EFSB-EG-1). Brockton Power submitted information showing that the proposed facility would be within an interim Zone II Wellhead Protection Area in Brockton -- the Hubbard Well -- and that 2500 feet downstream from the AWRF, the Salisbury Plain River flows into interim and delineated Zone II Wellhead Protection Areas for the Town of West Bridgewater (Exh. BP-1 (fig. 4.4-3), (fig. 1-5); BP-2 (app. B)). The Company indicated that, although the Hubbard Well is only 1300 feet from the site and is a City of Brockton municipal water supply well, it is currently inactive and used only for emergency water supply purposes (Exh. HO-RR-12). The Company also indicated that within half a mile of the proposed facility there are 13 private water supply wells which are probably used to supply potable water, with the closest well being approximately 1100 feet from the site (Exh. HO-RR-12).

Brockton Power stated that it is not proposing to monitor ground water at the proposed facility site (Exh. EFSB-EG-2).

In the Order of Conditions for the proposed facility, the Brockton Conservation Commission indicated that wetlands associated with the proposed facility represent a significant resource for ground water supply, and stipulated conditions to protect ground water supplies (Exh. EFSB-E-3 (f) (att.)). These conditions include: (1) operation and maintenance of a storm water management system in accordance with MDEP policy; (2) lining of storm water retention basins to avoid ground water recharge; and (3) incorporation of features into the design of the storm water basins that will allow shutdown and containment of spills (id.). The Company also asserted that the requirements of the Order of Conditions will ensure that groundwater is protected and that the use of effluent from the AWRF would not result in loss of groundwater recharge (Exh. EFSB-E-1, at B-10).

The Company indicated that potable water would be used by approximately 20 full time employees for sanitary purposes (Exh. EFSB-EU-1). The Company estimated potable water use at 1000 gpd but also presented a calculation, based on a formula established in Title 5 of the State Environmental Code, which suggested that average daily water use could be as low as 300 gpd (id.).

The Company indicated that the limited sanitary waste water from the facility would be discharged to the existing sanitary sewer system (Exh. BP-1, at 1-25). Brockton Power indicated that the facility would return 11,000 to 17,000 gpd of neutralized process water to the AWRF, after being treated to meet all of the City of Brockton industrial pre-treatment requirements (Exh. BP-1, at 1-22 to 1-23). To accommodate the volume of process water it returns to the AWRF, the Company has indicated that it would work with the City of Brockton's sewer infiltration and inflow ("I/I") reduction program (Exh. BP-1, at 1-22 to 1-23). The Company indicated that the approximately 200,000 gpd of blowdown from the facility's cooling towers would be returned to the AWRF downstream of the secondary treatment (Exh. EFSB-E-1, at B-20). The Company acknowledged that the cooling towers could concentrate water contaminants not removed during pretreatment; however, the Company stated that water returned to the AWRF would be in compliance with Brockton's pre-treatment standards and that the AWRF discharge permit would not be compromised by the facility blowdown (id.).

3. Mitigation Alternatives

Brockton Power provided information on an alternative cooling technology - an air cooled condenser system - which would effectively eliminate the consumptive water use necessary for the proposed wet mechanical cooling technology (Exhs. BP-1, at 4.4-23 to 4.4-26; EFSB-EU-10). The Company acknowledged that air cooling is a proven technology, but argued that air cooling would have environmental and cost disadvantages

which would outweigh any benefits of reducing water use (id.). The Company stated that the environmental disadvantages of air cooling include: (1) an average facility performance penalty of 3.67 MW due to efficiency loss and power consumed driving cooling fans (under hot summer conditions the penalty would be 7.37 MW); (2) noise increases at the nearest residences that would exceed noise from the proposed cooling system by 3 to 4 dBA (8 to 9 dBA increases total); and (3) large increases in the facility footprint (14,000 square feet) and height (id.). The Company also indicated that the additional capital costs of installing an air cooling system would be approximately $8,200,000, which represents a 5 percent increase in the plant cost before considering increased costs associated with maintenance and lost capacity (id.).

4. Analysis

Brockton Power proposes a wet mechanical cooling technology for its proposed facility. The record indicates that the cooling towers would use treated effluent from the Brockton AWRF for make-up water and that treated effluent would also be used to supply the process water for the proposed facility. In addition, the proposed facility would use as much as 325,000 gpd of injection water for NO_X control during oil firing. This water would either be purchased or generated over a period of several days by on-site treatment of available water.[(39)] The proposed facility would use less than 1000 gpd of the City of Brockton's municipal water supply.

Based on the Company's estimate of 1.4 mgd of predicted evaporation, the proposed facility would consume approximately 5185 gpd per MW of electricity generated. This rate of water consumption compares favorably with the per MW use of water-cooled facilities previously reviewed by the Siting Board.[(40)] However, it is significantly higher than the water requirements of recently reviewed air-cooled generating facilities. The Siting Board therefore reviews the impacts of this water use to determine whether it minimizes the environmental impacts of the proposed facility consistent with minimizing costs and other environmental impacts.

The Company evaluated the impact of the proposed consumptive water use on the Salisbury Plain River. The record demonstrates that the proposed water use would not result in flow rates for the Salisbury Plain River below any guidelines suggested to maintain resources downstream of the proposed facility, even during 7Q10 conditions.[(41)] Furthermore, the record indicates that the facility is neither within nor downstream of any stressed subbasins of the Taunton River drainage basin and that the proposed use would not negatively affect any downstream water resources. Although the record indicates that the City of Brockton and some surrounding towns have experienced water supply problems, this appears to be due to the location of these municipalities at the headwaters of adjacent drainage basins rather than water supply issues within the Taunton River basin which could be affected by the proposed use of AWRF effluent.

The Company analyzed the use of air-cooled condensers to mitigate water use. The record indicates, however, that the use of air-cooled condensers would result in a considerable additional capital outlay by the Company and would result in noise impacts and efficiency losses that could largely offset the benefits of decreased water consumption. Moreover, because the 1.4 mgd of water consumed on average by the proposed facility would be obtained from the Brockton AWRF, this water use would not decrease available municipal water supplies nor would it entail environmental impacts associated with water withdrawal from ground or surface water sources.

The record indicates that the proposed project will have minimal impacts on water quality in the Salisbury Plain River. The record shows that the consumptive water use by the proposed facility is approximately seven percent of average effluent from the AWRF, therefore increases in the concentration of dissolved solid in the effluent will be minimal. The Company indicated in the record that the small amounts of process water discharged from the facility will be equalized and neutralized and that all discharges will comply with pretreatment limits. Furthermore, the record shows that the volumes of sanitary wastewater from the proposed facility would be minimal and, additionally, that the Brockton Power would work with the City of Brockton to reduce I/I to accommodate process waste water returned to the AWRF.

The record demonstrates that the proposed facility site is within and upstream from existing ground water resource areas for municipal ground water supplies and is relatively near private wells. The record also indicates that although the site area is underlain by sediments that readily transmit water, the Company has no plans to monitor ground water. The Company has stated that the proposed project would not negatively affect ground water resources and that it would comply with conditions to protect ground water that were attached to the Order of Conditions for the proposed project. The Siting Board notes that the proposed project will require on-site storage of oil and other bulk chemicals that could pose a threat to ground water resources (see Section III. H.1, below). The Board also notes that the Company is proposing to store these chemicals within diked containment systems but it is not clear whether the Company would design these systems to protect groundwater. Therefore the Board directs the Company to incorporate ground water protection measures such as impermeable bases into the design of its bulk chemical storage containment systems.

Based on a review of the evidence presented, the Siting Board concludes that the Company's plan to reuse waste water from the AWRF would minimize the water resource impacts of the proposed facility consistent with minimizing other potential environmental impacts and cost. With regard to ground water, the Siting Board concludes that with implementation of the condition described above, the proposed facility would minimize environmental impacts to ground water impacts consistent with minimization of cost. Accordingly, the Siting Board finds that, with implementation of the above condition, the environmental impact of the proposed facility would be minimized with respect to water resources.

D. Wetlands

This section describes wetland impacts which would result from construction of the proposed facility, possible impacts from operation of the facility, and the proposed mitigation of potential impacts.

1. Description

Brockton Power indicated that the Brockton Conservation Commission, the MDEP, and the United States Army Corps of Engineers ("USCOE") would regulate wetland impacts from construction and operation of the proposed facility (Exh. BP-1, at 4.5-1 to 4.5-18). The Company indicated that most of the wetlands or wetland resource areas at the site are regulated by the MDEP under the Massachusetts Wetlands Protection Act and its implementing regulations ("MWPA")(G.L. c. 131, § 40; 310 CMR 10.00), which are administered in Brockton by the Brockton Conservation Commission (Exhs. BP-1, at 4.5-1 to 4.5-18; EFSB-E-3(a)). The specific wetland resources regulated under the MWPA include Land Under Water Bodies and Waterways, Bank, Riverfront Area, Bordering Land Subject to Flooding, and Bordering Vegetated Wetlands (Exh. BP-1, at 4.5-1 to 4.5-18). The Company stated that the MDEP also administers Section 401 of the Water Quality Certification Program (314 CMR 9.00) but that the USCOE regulates isolated wetlands under Section 404 of the Clean Water Act (33 U.S.C. 1344) (id.). The Company identified additional regulations related to wetland impacts including the EPA's National Pollution Discharge Elimination System ("NPDES") General Permits for Storm Water Discharges from Construction Activities and NPDES Permits for Industrial Discharge of Storm Water (40 CFR Part 122) (Exh. BP-2, at 2-10).

Brockton Power indicated that it conducted a wetland survey of the project site to identify wetland resource areas on-site and in areas directly adjacent to the site (Exh. EFSB-E-3(a)). Specifically, the Company identified an Isolated Wetland along the southern boundary of the site and Land Under Water Bodies and Waterways ("LUW"), Bank, Riverfront Area, Bordering Land Subject to Flooding (BLSF"), and Bordering Vegetated Wetland ("BVW") along the western and southwestern edges of the site in proximity to the Salisbury Plain River (Exh. BP-1, at 4.5-4 to 4.5-13).[(42)]

Brockton Power indicated that the proposed project would require the filling of 21,300 square feet of the BLSF (31,950 cubic feet of flood storage) in the southwest corner of the site (Exh. BP-1, at 4.5-13). In addition, the Company stated that it would temporarily alter 150 square feet of BVW and approximately 550 square feet of BLSF in order to construct a waste water supply/return line (Exh. BP-1, at 4.5-13). The Company submitted information showing that a small portion of the filled BLSF on the site and

most of the temporarily altered BLSF would also be within the 100-foot wetlands buffer zone (Exh. BP-2 (fig. 5.9-1)). The Company submitted information indicating that LUW, Bank, and Riverfront Area at the western boundary of the site would not be affected by the proposed project (Exh. EFSB-E-2(a)).

Brockton Power also evaluated the wetland impacts that would result from construction of the facility's gas pipeline and electric transmission interconnections (Exh. BP-1, at 4.5-3; 4.5-14). The Company submitted information showing that wetlands impacts from the construction of the transmission interconnection would be limited to construction of the interconnect within the 100 foot buffer zone to wetlands adjacent to Oak Hill Way and the Old Colony Rail ROW (id.; Exhs. HO-RR-2 (att.); HO-RR-20 (a) (att.)). The Company determined that there would be no wetlands impacts associated with construction of the gas pipeline because the interconnect would be within the existing ROW for Industrial Boulevard (id.).

Brockton Power stated that the proposed project has been designed to prevent indirect wetlands impacts associated with erosion and sedimentation that could result from the project (id.). The Company also indicated that it would treat stormwater in four state-of-the-art stormwater detention basins, which would minimize indirect impacts from run-off discharged into wetlands (id.).

2. Proposed Wetlands Impact Mitigation

Brockton Power stated that the proposed project would incorporate structural designs and best management practices ("BMPs") to avoid and minimize direct and indirect wetland impacts to the maximum extent practicable (Exh. BP-1, at 4.5-14). Specifically the proposed project would include compensatory flood storage, restoration of BLSF and BVW, erosion and sedimentation ("E&S") control, and stormwater management (id. at 4.5-15 to 4.5-17).[(43)] The Company also indicated that, by lowering the elevation of upland areas adjacent to BVW, it would restore an area of wetlands that was previously filled (Exh. EFSB-E-3(d)). Furthermore, the Company indicated that an existing 30 inch concrete drain pipe that is currently discharging into BVW will be pulled back out of wetland resource areas and that the new discharge point will be provided with a rip-rap channel to dissipate run-off velocity, thus mitigating erosion (id.).

To compensate for BLSF that would be filled, Brockton Power indicated that it would create 22,470 square feet of new BLSF with a flood storage volume of 40,446 cubic feet (Exhs. BP-1, at 4.5-15; EFSB-E-3(e)(4)). The Company indicated that the compensatory BLSF:

(1) would be located adjacent to the Salisbury Plain River, just west of the proposed facility;

(2) would be planted with appropriate vegetation to compensate for lost fauna habitat; (3) would have unrestricted hydraulic connection with the river; and (4) would avoid potential increase in flood-stage stream velocities by not creating any restriction to flow (id.).

Brockton Power indicated that the proposed water supply/return easement (10 feet wide) through the BLSF and the 150 square feet of BVW would be restored, in kind, following installation of the water lines (Exh. BP-1, at 4.5-15 to 4.5-16). The Company outlined the restoration, which would include regrading disturbed land to previous elevations and seeding with an appropriate plant mix (id.). For the BLSF, the Company indicated that the seed mix would include rapidly colonizing upland plants and grasses (id.). For BVW the Company proposed plantings similar to previously existing flora, which may include shrubs and saplings (id.).

Brockton Power outlined its proposed E&S control program and its stormwater management plan, which are designed to mitigate potential indirect impacts to wetlands (Exh. BP-1, at 4-16 to 4-18). The Company indicated that the proposed E&S control program would incorporate BMP guidelines of the MDEP and EPA, including: (1) erosion control barriers (staked haybles/silt fences) down gradient from the limit of work and around soil stockpiles;

(2) stabilized construction exits with anti-tracking pads; (3) temporary sedimentation basins and diversion swales; (4) protection of catch basins with silt sacks or staked hay bales; and (5) project phasing, temporary mulching and seeding, and maintenance of sediment controls (id.).[(44)]

Brockton Power described its proposed stormwater management program as the diversion and piping of on-site stormwater to designated catch basins which would be designed to intercept floating contaminants and to allow suspended solids to settle (id.). The Company also indicated that it would regularly sweep the streets and limit use of salt and sand on site to mitigate potential water quality impacts from stormwater run-off (id.). The Company stated that its proposed E&S controls and stormwater management plans would comply with NPDES and Massachusetts Stormwater Management policy (id.).

3. Analysis

The record shows that the proposed project would result in three types of impacts to regulated wetland resource areas: (1) the temporary disturbance of 150 square feet of BVW;

(2) the filling of 21,300 square feet of BLSF; and (3) construction of the generating facility, the electrical interconnect[(45)] and the wastewater interconnect within the 100 foot buffer zone to BVW. However, the record also indicates that the Company has received

an Order of Conditions from the Brockton Conservation Commission, that the disturbed BVW and additional BVW would be restored, and that a compensatory are a would be created to mitigate filled BLSF at a ratio greater than 1:1.

The record documents that potential indirect wetland impacts from stormwater and from erosion and sedimentation would be mitigated by stormwater management and E&S control programs. The record also indicates that the proponent has committed to implement E&S and stormwater control programs designed to comply with the requirements of the NPDES General Permit for Storm Water Discharges from Construction Activities and with the Massachusetts Stormwater Management Policy.

Accordingly, the Siting Board finds that, with implementation of mitigation proposed by Brockton Power, the environmental impacts of the proposed facility would be minimized with respect to wetlands.

E. Solid Waste

This section describes the solid waste impacts of the proposed facility and the mitigation proposed by the Company.

1. Description

Brockton Power indicated that solid and hazardous waste would be generated during construction, operation, and maintenance of the proposed facility (Exhs. BP-1, at 4.7-1 to 4.7-2; EFSB-SW-2). The Company stated that all solid and hazardous waste at the proposed facility would be properly stored and removed by appropriately licensed haulers (Exhs. EFSB-SW-1; EFSB-SW-2). Furthermore, the Company stated that it would meet all federal, state, and local requirements governing the handling, storage, and disposal of hazardous waste (id.).

Brockton Power indicated that construction-related solid waste would include excess fill, waste lumber (from pallets and packing boxes), packaging material, and scrap material (wire, pipe, insulation, and siding) (Exh. BP-1, at 4.7-1 to 4.7-2). The Company also indicated that construction workers would generate household-type sanitary solid waste and that hazardous wastes such as cleaning solvents, oils, and solvent based coatings would be generated prior to facility start-up (id.; EFSB-SW-2). The Company proposed to collect construction debris in large roll-off containers which would be hauled to an appropriate construction and demolition debris ("C&D") landfill by a licensed contractor (id.). The Company indicated that sanitary and hazardous waste generated during

construction would be collected in appropriate containers and removed for disposal by licensed solid and hazardous waste contractors (id.).

Brockton Power indicated that solid waste generated during facility operation would include mixed office waste, water treatment solids, and miscellaneous broken or damaged machine parts and electrical materials (Exhs. BP-1 at 4.7-1 to 4.7-2; EFSB-SW-1). The Company projected that one 12-foot roll-off container per week would be sufficient to handle operational solid waste (Exh. EFSB-SW-1). The Company stated that potential hazardous waste generated during facility operation would include spent lubrication filters, empty hazardous material containers, water treatment filter media, sludge (from sand filters), cooling tower muck, and spent SCR catalysts (Exh. EFSB-SW-2). With regard to handling procedures for hazardous wastes, the Company indicated that waste would be: (1) collected in an appropriately designed hazardous waste storage area; (2) removed by an authorized hazardous waste hauler; and

(3) disposed of at an authorized hazardous waste management facility (Exh. EFSB-SW-2).

Brockton Power discussed practices or procedures it would use to minimize solid waste impacts (Exh. BP-1, at 4.7-1 to 4.7-2). With regard to construction waste, the Company indicated that it would endeavor to minimize or eliminate the amount of fill that would be removed from the site and that garbage containers would be placed throughout the site to minimize litter (id.). The Company also indicated that, during operation, office paper and metal machine parts would be recycled, as appropriate (id.; EFSB-E-1, at B-18).

2. Analysis

The record demonstrates that Brockton Power or its licensed contractor would dispose of all un-recycled solid waste generated during construction and operation of the proposed facility at appropriate disposal sites in a manner consistent with applicable government regulations. The record also shows that the Company would minimize off-site disposal of fill and recycle office paper.

The record does not, however, include any procedures for segregating or recycling construction waste. The Company has stated that construction related debris, including lumber waste and scrap cable, wire, pipe, and siding would be removed to a C&D landfill for disposal. The Siting Board notes that many of these materials may be recyclable, and that in recent proceedings before the Siting Board other developers of generating facilities have committed to segregating and recycling construction debris.[(46)] Therefore, the Siting Board directs Brockton Power to develop and implement a plan for segregating and recycling wood, metal, and other recyclable debris during the construction phase of the proposed project. In the event that the Company determines that recycling of selected construction debris is impractical or burdensome, the Siting Board directs the Company

to submit a detailed evaluation of the factors that contributed to this determination, including an analysis of the waste stream, an analysis of costs associated with disposal and recycling, and a comparison of recycling costs to potential environmental benefits of recycling at the proposed facility.[(47)]

Accordingly, the Siting Board finds that, with implementation of the above condition, the solid waste impacts of the proposed facility would be minimized.

F. Visual Impacts

This section describes the visual impacts of the proposed facility on nearby sections of the Town of West Bridgewater and the City of Brockton, and describes proposed mitigation of the impacts.

1. Description

Brockton Power performed a viewshed analysis to assess the visual impact of the proposed generating facility and electrical interconnection on nearby residential and public areas (Exhs. BP-1, at 4.10-1 to 4.10-7; EFSB-V-1). The Company asserted that the visual impacts of the proposed facility at sensitive locations would be minimal due to variable screening provided by existing foliage and commercial buildings (Exh. BP-1, at 4.10-1). The Company also claimed that the facility would not be visible from most locations within surrounding neighborhoods and that even where visible, the facility's appearance would be consistent with surrounding industrial uses (Exh. BP-1, at 4.10-2; 4-10-7).

Brockton Power indicated that the most prominent structures associated with the proposed facility would be the 185 foot exhaust stack, the 80 foot HRSG building, and the 65 foot turbine building (Exh. BP-1, at 4.10-1). To assess the visual impact of these structures and the 79 foot utility poles for the electrical interconnect , the Company used USGS topographic maps to identify areas where the facility -- specifically the exhaust stack - could be visible, and then performed a drive-through survey to identify representative viewsheds (Exhs. BP-1,

at 4.10-7 to 4.10-7; EFSB-V-1; EFSB-V-4).[(48)] The Company then performed a visual assessment of potential viewshed locations by using photographic techniques and survey instrumentation to evaluate the direction and elevation of potentially visible facility structures (id.).

The Company analyzed views of the proposed facility from ten locations (Exhs. BP-1, at 4.10-2 to 4-10-7; EFSB-V-1; EFSB-V-2). The Company indicated that four of these analysis locations are near residential areas along Route 28, including one location in West Bridgewater (Viewshed #1) and locations in Brockton that are southwest, west, and northwest of the facility (Viewsheds #6, #2, and #3, respectively) (id.). The Company identified another analysis location due north of the site along Plain Street (Viewshed #4) and three additional analysis locations northeast, east, and southeast of the facility (Viewsheds #7, A, and #5, respectively) (id.). The Company also performed viewshed analyses for the facility and originally proposed electric interconnect route at two locations along Appleby Street (Viewsheds A and B) and a third location along the existing 115 kV transmission corridor east of the site (Viewshed C) (id.). The Company submitted a map showing that there were no potential sensitive viewing areas immediately south or southeast of the site (Exh. BP-1 (fig. 4.10-1)).

Brockton Power's visual impact analyses indicated that, from most locations, only the top of the exhaust stack would be visible, due to partial screening provided by existing trees and intervening commercial buildings (Exhs. BP-1, at 4.10-1 (figs. 4.10-3 to 4.10-8)). The Company stated that from locations with a view of the stack top (Viewsheds #1, #2, #3, and #6), an observer would see the stack within a cluster of existing commercial buildings, poles, and signs that make up the skyline from these viewing locations (Exh. BP-1, at 4.10-7). A notable exception is due east of the site, at Viewshed A, where the Company's analysis shows that much of the exhaust stack would be visible (Exh. EFSB-V-3 (att. 3A and 3B)). Another exception is the view from northeast of the site, at the 4 story Crown Point Condominium building where the Company speculated that there would be a view of the facility from residences above the groundfloor (Exh. BP-1, at 4.10-6).[(49)] The Company argued, however, that the current view from the condominiums toward the proposed site already has an industrial character (id.). In support of this contention, the Company submitted an areal photo of the site and surrounding area which shows that the current view from the Crown Point Condominiums toward the site would include commercial buildings and the AWRF (Exh. BP-1, at (fig. 4.10-2)).

Brockton Power indicated that it would maintain existing local screening and provide plantings and landscaping at the facility entrance and along the north and east side of the facility, in order to minimize the visual impact of the proposed facility (Exhs. BP-1, at 4.10-2;

EFSB-V-2). The Company indicated that the facility color scheme would use monochromatic neutral colors, chosen in consultation with the City of Brockton (id.). The Company also stated that the proposed sub-GEP stack height of 185 feet would minimize visual impacts of the stack and would avoid impacts from lighting that the FAA may require for structures over 200 feet tall (Tr. 2, at 348-349).

With regard to visual impacts of the proposed utility interconnect, the Company submitted documentation showing that utility poles along the original interconnect route would be visible from residences along Appleby Street (Exh. EFSB-V-1 (fig. EFSB-V-1b)). During the proceeding, the Company revised its proposed interconnect route so as

to avoid a portion of the MBTA ROW that abuts a residential neighborhood (Exhs. EFSB-V-1 (fig. EFSB-V-1a); HO-RR-20 (a) (att.);Tr. 1, at 126). The Company stated that the revised interconnect route would mitigate the visual impacts of the interconnect line, with the exception of impacts of a corner pole proposed for the preferred interconnect route which the Company has indicated would be near the southernmost residence along Appleby Street (Exh. EFSB-EL-11; Tr. 1, at 126).[(50)]

Brockton Power stated that it would work with homeowners in close proximity to the proposed facility to develop and implement reasonable mitigation measures, as appropriate (Exh. EFSB-V-2). The Company indicated that it would be willing to work within the framework of a Siting Board condition that requires screening for affected residents who make reasonable requests for mitigation of visual impacts (Tr. 2, at 345).

2. Analysis

The record demonstrates that, from most directions, the proposed facility would be largely screened from view by existing trees and commercial buildings and that views of the facility from most residential areas would be limited to variable portions of the exhaust stack. From the upper floors of the Crown Point Condominium building, a substantial portion of the proposed facility likely would be visible. However, the existing view from Crown Point Condominiums is already characterized by industrial development and the appearance of the proposed facility would be consistent with surrounding industrial uses.

The Company has indicated that in order to minimize the visual impacts of the proposed facility it would choose a color scheme in consultation with the City of Brockton and maintain plantings and landscaping along the north and east sides of the site. In addition, the Company has proposed a change to the electrical interconnect route which would reduce visual impacts on the residential neighborhood along Appleby Street in Brockton.[(51)]

The record shows that the Company is willing to work with homeowners to mitigate visual impacts of the proposed facility in areas where views are possible. In recent decisions, the Siting Board has required proponents of generating facilities to provide selective tree plantings and other reasonable mitigation in residential areas up to one mile from the proposed stack location to mitigate the visibility of the facility and the associated stack. ANP Blackstone Decision; EFSB 97-2, at 143-144; ANP Bellingham Decision, EFSB 97-1, at 128; Berkshire Power Decision, 4 DOMSB at 395. Consistent with this precedent, the Siting Board directs the Company to provide reasonable off-site mitigation of visual impacts at affected residential properties and at roadways and other locations within one mile of the proposed facility, as requested by individual property owners or appropriate municipal officials. For this decision, reasonable offsite mitigation could include shrubs, trees, or other mutually-agreeable measures, such as window

awnings, that would screen views of the proposed generating facility and related facilities including the proposed electrical interconnect line.

In implementing this requirement, the Company: (1) shall provide shrub and tree plantings, or other reasonable mitigation such as window awnings 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 potentially affected property owners, prior to the commencement of construction; (3) may limit requests for mitigation measures from local property owners and municipal officials 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 be responsible for the reasonable maintenance

and replacement of plantings, as necessary, to ensure that healthy plantings become established.

Accordingly, the Siting Board finds that, with the implementation of the foregoing condition, the environmental impacts of the proposed facility would be minimized with respect to visual impacts.

G. Noise Impacts

This section describes the noise impacts of the proposed facility, the mitigation proposed by the Company, and the costs and benefits of any additional mitigation options.

1. Description

Brockton Power stated that, with proposed noise mitigation measures, noise generated by operation of the proposed facility would result in levels at residential receptors that are well below the MDEP noise policy, which limits noise increases at the project property boundary to a maximum of 10 dBA (L_{90})[(52)] above ambient noise levels and prohibits the introduction of pure tone conditions (Exh. BP-1, at 4.11-4; 4.11-22).[(53)] Although the Company indicated that the proposed facility would not be a source of pure tone conditions at community locations, it indicated that the proposed facility would result in noise level increases at the project property boundaries that are greater than 10 dBA (id.). The Company indicated that the City of Brockton does not have quantitative noise level standards or a local noise control ordinance (id; Exh.

HO-RR-4 (att. at 7-26)).

Brockton Power calculated expected noise levels by measuring ambient levels in the area around the proposed facility site and adding these values to the modeled noise levels expected to be produced by the operation of the proposed facility (Exh. HO-RR-4 (att. at 7-4 to 7-25)). To determine ambient noise levels, the Company performed a noise level survey at five sound monitoring locations ("SML") surrounding the site and at one location on the facility property boundary (Exh. HO-RR-4 (att. at 7-4 to 7-15)).[(54)] The Company's survey indicated that ambient noise levels in the surrounding community ranged from 40 to 45 dBA during the quietest part of the night and from 46 to 53 dBA during the daytime (Table 4) (id.). The Company indicated that the noise level measurements were dominated by roadway noises from Route 28 and various sources associated with activities at the Oak Hill Industrial Park (id.).

Brockton Power used daytime and nighttime ambient L_{eq} measurements to calculate L_{dn} values for the sound level measurement points (Exh. EFSB-N-4). The Company's data indicate that L_{dn} measurements for the surrounding community are primarily between 54 dBA and 57 dBA, but that one monitoring location, a Cumberland Farms at the corner of Route 28 and Hayward Avenue, had an L_{dn} measurement of 64 dBA (id.). Thus, most of these levels are above the EPA's recommendation that an equivalent sound level 55 dBA (L_{dn}) would be requisite to protect public health and welfare with an adequate margin of safety (Exhs. BP-1, at 4.11-4; EFSB-N-3, (att. at 3)).[(55)]

Table 4.

Monitoring Station	Relative Location (from proposed stack)	Daytime dBA (L_{90})	Nighttime dBA (L_{90})	Calculated dBa (L_{dn})	Location Description
SML-1	2,200 ft (south)	49	40	54	Beacon Mobile Home Park
SML-2	1,100 ft (west)	53	44	64	Cumberland Farms
SML-3	1,800 ft (northeast)	50	42	56	Crown Place Condominiums
SML-4	1,600 ft (east)	46	42	55	Appelby & Geralynn Streets
SML-5	550 ft (east)	47	45	57	Facility Property Boundary
SML-6	3,200 ft (north)	47	43	57	Housing Authority Towers

Table 4. Measured ambient noise levels for the area surrounding the proposed facility (Exhs.

HO-RR-4 (att.) (Table 7.1-8); EFSB-N-4).

Brockton Power indicated that operational noise levels for the proposed facility were modeled using standard sound propagation principles and sound level input values from measured ambient levels, acoustics literature, and field measurements (Exh. HO-RR-4 (att.

at 7-19 to 7-24; app. B)). The Company also indicated that the noise level model incorporates a base-case noise attenuation package for the facility but does not apply attenuation associated with soft ground absorption, foliage, or tree cover (id.). The Company indicated that the noise modeling points were chosen to represent actual locations of sensitive receptors rather than ambient measurement locations (id.).[(56)]

The results of the Company's modeling indicate that the L_{90} noise levels at the nearest residential receptor would increase by 5 dBA at night to 49 dBA and increase by as much as 2 dBA during the day to 54 dBA (Table 2) (id.). The Company indicated that approximately 25 residences could have nighttime L_{90} increases of between 4 and 5 dBA and daytime increases of between 1 and 2 dBA (id.). In regard to the potential effect of noise increases, the Company asserted that noise level increases of 3 dBA are the smallest increases which are noticed in a typical community (id.). The Company indicated that model L_{dn} noise levels increase of 0 to 1 dBA would be expected at residential receptors (Exh. EFSB-N-4).

Table 5.

Model Station	Expected Plant Noise L_{90}, dBA	Nighttime Total L_{90}, dBA	Nighttime Increase L_{90}, dBA	Daytime Total L_{90}, dBA	Daytime Increase L_{90}, dBA	Day/Night Total L_{dn}, dBA	Day/Night Increase L_{dn}, dBA
R-1	38	42	2	49	0	57	0
R-2	47	49	5	54	1	64	0
R-3	42	45	3	51	1	57	1
R-4	44	46	4	48	2	58	1
R-5	40	45	2	48	1	56	0
PL-1	64	64	19	64	17	64	7
PL-2	61	61	16	61	14	---	---
C-2	54	55	10	55	8	---	---

Table 5. Model noise levels for operation of the proposed facility and resulting noise levels from a combination of facility noise and ambient noise levels (Exhs. HO-RR-4 (att.) (Table 7.1-8); EFSB-N-4). See Table 4 for measured ambient noise levels.

The Company's data indicated that the nighttime L_{90} increases over ambient would be 19 and 16 dBA at the southern and northern property boundaries, respectively, and that daytime increases would be 17 and 14 dBA (Exh. HO-RR-4 (att. at 7-19 to 7-25)). The Company indicated that L_{90} noise increases of 10 dBA would not extend beyond areas zoned as I-3 during the daytime or nighttime and that properties adjacent to the site on the north and south (most affected areas) are low sensitivity industrial areas (including an ash landfill to the south) (id.). The Company also indicated that the non-industrially zoned area which is closest to the proposed facility is zoned for commercial use (C-2) and that neither C-2 nor I-3 zoned areas could be developed for residential uses without a variance from the City of Brockton (Exhs. EFSB-N-1R; EFSB-EL-3). At the property boundary (PL-1) Brockton Power's modeling predicted a 7 dBA increase in the L_{dn} (Exh. EFSB N-4).

Brockton Power indicated that construction activity at the site would last for approximately 18 months and that various phases of the construction activity would likely overlap (Exh. EFSB-N-2). The Company evaluated potential construction-related noise using the EPA document "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances", which includes a model for calculating equivalent noise levels based on the quantity of machinery and type of construction activity being performed (Exh. HO-RR-4 (att. 7-15 to 7-18)). The Company reported modeled construction noise levels at the nearest residence (1,100 feet) ranging from 51 dBA (L_{eq}) for foundation construction to 73 dBA (L_{eq}) for possible pile driving (id.). The Company also reported that steam blows would be necessary during the final stages of plant construction, and noted that steam blows although loud, would be short in duration and would occur over a limited period of time (id). The Company also indicated that construction would occur only between the hours of 7:00 a.m. to 3:00 p.m. Monday through Friday, except for unusual circumstances (Tr. 2, at 183-184).[(57)]

2. Proposed Mitigation and Mitigation Alternatives

Brockton Power presented a base-case noise mitigation package, which was incorporated into the noise modeling discussed above, and an alternative "no impact" mitigation package that would attenuate potential noise impacts to a less than 3 dBA increase at all residential receptors (Exh. HO-RR-4 (att. at 7-26 to 7-29)). The base-case mitigation package included: (1) housing of major generating components in acoustically treated buildings; (2) ventilation fans with a low noise level design and possibly acoustical

louvers; (3) duct silencers for turbine intake and exhaust; (4) low-speed aerodynamic fans and splash protection material for cooling towers;

(5) housing the gas compressor in an acoustically treated building; (6) lagging and wrapping exposed natural gas pipes and valves; and (7) installing low noise transformers with barrier walls (id. at 7-19 to 7-22). The Company stated that the facility might incorporate noise mitigation treatments different from those proposed in the base case, but that the final design would meet the same performance goals (id.).

Brockton Power indicated that the base-case mitigation package would mitigate most of the noise sources to a level far below the noise produced by the cooling towers; therefore in considering additional noise mitigation measures the Company focused on the cooling towers but included some additional mitigation for the combustion turbine intake and the main transformer (id.). The Company estimated that it would cost $746,000 more than the "several million dollars" of cost associated with the base case mitigation package to limit nighttime noise increases to 3 dBA at the most affected residence (id.). The Company argued that, given the 2 dBA maximum reduction which would result from this expenditure, the cost of additional mitigation would be prohibitive (id.). The Company therefore concluded that its base-case mitigation package represents best available noise control technology (id.).

With regard to construction noise, Brockton Power indicated that noise from steam blows would be mitigated, to some extent, by portable attenuators (Exh. HO-RR-4 (att. at 7-15 to

7-18)). To mitigate potential noise from pile driving (the loudest construction activity) the Company proposed to use vibration pile driving, but indicated that subsurface conditions would ultimately dictate the driving method used (id.).

3. Analysis

In past decisions, the Siting Board has reviewed the noise impacts of proposed facilities for general consistency with applicable governmental regulations, including the MDEP's 10 dBA standard. ANP Blackstone Decision, EFSB 97-2/98-2, at 153; Millennium Power Decision, EFSB 96-4, at 152; Altresco-Pittsfield , Inc. ,17 DOMSC 351, at 401(1988). In addition, the Siting Board has considered the significance of expected noise increases which, although lower than 10 dBA, may adversely affect existing residences or other sensitive receptors. ANP Blackstone Decision, EFSB 97-2/98-2, at 153; Millennium Power Decision, EFSB 96-4, at 152; Northeast Energy Associates, 16 DOMSC 335, at 402-403 (1987).

An analysis of potential noise impacts from operation of the proposed facility indicates that L_{90} noise levels at the nearest sensitive receptor would be 49 dBA during the night

and 54 dBA during the day. These levels represent increases above background of 4 to 5 dBA at night and 1 to 2 dBA during the day. Nighttime and daytime increases at other sensitive receptors are predicted to be less than 3 dBA and, according to the Company, would not be noticeable in a typical community.

The noise analysis indicated that L_{90} noise increases at the boundary of the proposed facility would be 14 to 17 dBA during the day and 16 to 19 dBA at night. The record shows, however, that noise increases due to facility operation are less than 10 dBA beyond areas zoned for industrial use (I-3). The record also shows that residential development in industrially zoned areas as well as adjacent commercially zoned areas (C-2) could only occur with a variance from the City of Brockton.[(58)]

The Company presented an analysis of more extensive noise mitigation which indicated that for an additional cost of $746,000 it may be possible to limit potential noise increases to a 3 dBA maximum for all residential receptors. The record indicates that although this additional noise mitigation package would decrease maximum noise levels at the property boundary from 64 dBA to 60 dBA, maximum noise increases would be 15 dBA over ambient.

In past decisions, the Siting Board has allowed noise increases at residential receptors of up to 8 dBA. Berkshire Power Decision, 4 DOMSB 221, at 205-206; ANP Bellingham Decision, EFSB 97-1, at 141-142; ANP Blackstone Decision, EFSB 97-2/98-2, at 156-158. The maximum predicted noise increases of 4 to 5 dBA, which could affect approximately 25 homes, would be well below these limits. Relatively high daytime and nighttime ambient noise appears to result in measured L_{dn} noise levels at the nearest sensitive receptors that are greater than the 55 dBA L_{dn} level which EPA has indicated is requisite to protect public health and welfare with an adequate margin of safety. However, the L_{dn} increases at sensitive receptors modeled for operation of the proposed facility are 0 to 1 dBA. Therefore, the Siting Board does not anticipate that the proposed facility would exacerbate an already marginal noise situation in the community surrounding the proposed facility. Accordingly the Siting Board finds that, with the Company's base-case noise mitigation package, the environmental impacts of the proposed facility with regard to operational noise would be minimized.

With respect to construction noise impacts, the Siting Board agrees that adherence to the Company's proposed hours of construction, noise mitigation for steam blows, and use of vibration pile driving (if possible), would minimize construction noise impacts. Therefore, the Siting Board finds that the environmental impact of the proposed facility with respect to construction noise would be minimized.

Accordingly the Siting Board finds that the environmental impacts of the proposed facility would be minimized with respect to noise.

H. Safety

This Section describes the safety impacts of the proposed facility with regard to materials handling and storage, fogging and icing, and proposed emergency response plans.[(59)]

Brockton Power indicated that safety issues would be given careful consideration in the selection of contractors for construction and operation of the proposed facility (Exh. BP-1, at 4.8-1). The Company indicated that all Occupational Safety and Health Administration ("OSHA") regulations would be followed during construction of the facility and that the contractor would have an on-site safety engineer throughout construction (id.). The Company stated that it would maintain a safe facility through well-trained operating personnel, well thought out operating and emergency response procedures, regular safety training and drills, and an aggressive preventative maintenance program (id.).[(60)] The Company also stated that it would include exacting safety standards in contract requirements for the operation of the facility (id.).

1. Materials Handling and Storage

Brockton Power reviewed safety issues related to the storage and handling of distillate fuel oil at the proposed facility (Exh. BP-1, at 4.8-1 to 4.8-2). The Company stated that fuel oil would be stored in a 20 foot high, 60 foot diameter welded steel tank with a 500,000 gallon nominal capacity (id.). The Company indicated that the storage tank would be surrounded by a dike capable of holding 110 percent of the tank volume, would be leak tested prior to filling, and would be periodically inspected thereafter (id.). The Company stated that it would construct the tank, dike, and related structures in accordance with 527 CMR 9.00 and other applicable standards (Exh. EFSB-E-1, at B-6). Finally, the Company indicated that it would consult with the Brockton Fire Department and make the appropriate applications for the proposed storage tank to the Department of Fire Services (id.).

Brockton Power also outlined safety procedures and precautions for the delivery of fuel oil (Exh. HO-RR-4 (att. 4.8-1 to 4.8-2)). The Company indicated that it would transfer fuel oil from standard tank trucks in a bermed area at a permanent unloading station equipped with fast-action shutoff valves, closure valves, an approved drip collection mechanism, and an automatic shutoff for the pump system (id.). The Company stated that during oil delivery it would: (1) require the delivery driver and a facility operator to monitor the entire unloading process; (2) chock the truck wheels before connecting hoses; and (3) check the tank level before fuel unloading (id.). The Company also indicated that it would store appropriate cleanup and containment equipment on-site, in accordance with the Massachusetts State Fire Marshal regulations.

Brockton Power indicated that aqueous ammonia (17.5 to 19.5 percent concentration) would be stored in a 20,000 gallon welded steel tank that would either be double walled

or contained in a 110 percent capacity dike (Exh. BP-1, at 4.8-2 to 4.8-3). The Company indicated that the ammonia storage and containment structure would be housed within a building (Tr. 1, at 60 - 61). The Company's proposed containment safety plans included: (1) periodic inspection of storage structures; (2) use of buoyant spherical baffles to minimize aqueous ammonia surface area within the containment dike, in the event of a spill; (3) control room monitoring of tank level with alarms for rapid level reduction; and (4) specific emergency response procedures (Exh. BP-1, at 4.8-2 to 4.8-3). The Company also indicated that ammonia would be unloaded in a bermed area constructed for delivery of bulk chemicals and that the unloading procedures would be similar to those outlined above for fuel oil delivery (id.).

Brockton Power performed modeling of an accidental release from the aqueous ammonia storage tank (Exh. HO-RR-4, at 6-30 to 6-32). The Company explained that it used the HGSYSTEM accidental release algorithm to calculate an ammonia emission rate from the containment building and the SCREEN3 model to determine the maximum hourly ground level concentrations of the ammonia (id.). The Company's modeling indicated that a catastrophic release of ammonia from the storage tank would result in maximum hourly ground level ammonia concentrations of 0.61 ppm (id.). The Company noted that this level is far below the ammonia toxic endpoint of 200 ppm and the odor threshold of 50 ppm (id.).[(61)]

Brockton Power indicated that other chemicals and oils stored on-site would include: (1) sulfuric acid (93 percent) and sodium hydroxide (50 percent) for regeneration of the water demineralizers; (2) sodium hypochlorite [(62)] (10-15 percent) as a biocide to prevent growth of organics in the cooling towers; (3) sodium bisulfite (40 percent) to treat cooling water blowdown; (4) various water treatment chemicals for the HRSG water system; and (5) various oils and maintenance chemicals (Exh. BP-1, at 4.8-3 to 4.8-4). The Company indicated that most of these chemicals would be stored in permanent bulk storage tanks within containment dikes sized to hold 110 percent of the tank contents (id.). The Company indicated that chemicals in portable tanks and drums would be stored in a properly bermed and enclosed area when not in use (id). Similarly, the Company indicated that maintenance chemicals would be properly stored in an appropriately designed area (id.).

2. Fogging and Icing

Brockton Power used the Electric Power Research Institute's modeling program, entitled the Seasonal and Annual Cooling Tower Impacts ("SACTI"), to analyze the potential for icing and fogging related to the operation of the proposed wet mechanical draft cooling towers (Exh. HO-RR-4 at 6-18 to 6-29).[(63)] The Company indicated that, for each of 16 wind directions, the SACTI model calculates the number of hours of fogging and rime icing that would be expected over the five years of meteorological data used as model input (id., at 6-21 to 6-22).[(64)]

Brockton Power's modeling results indicate that a 3500 foot stretch of Route 28, located west and southwest of the proposed site, would experience ground level fogging between 2 and 15 hours a year (id. (fig. 6.6-1)). In addition the Company's data showed that residential and commercial areas on both sides of Route 28 in Brockton and in adjacent portions of West Bridgewater would be affected, but that Oak Hill Way and other areas west and north of the facility would experience fogging less than 1 hour per year (id.). The Company's model results for rime icing indicated that an area stretching 2000 feet south of the facility could have an annual average duration of rime icing events from 1.2 to 0.4 hours (id. (fig. 6.6-2, at 6-22)). The Company submitted data showing that rime icing would mainly affect the Brockton AWRF but that the southern end of Oak Hill Way and possibly the trailer park area in West Bridgewater could be affected for less than half an hour a year (id.).

Brockton Power asserted that its fogging analysis was conservative because the SACTI model does not consider plume mixing which would result from the plume drifting over other facility structures and because it includes nighttime hours, periods of rain and snow, and natural fogging conditions (id. at 6-22). The Company also argued that offsite icing would be likely to occur during periods of "background icing" and would not significantly contribute to additional icing (Exh. EFSB-E-1, at B-18).

3. Emergency Response Plan

Brockton Power stated that, prior to facility operation, it would develop a Spill Prevention, Control and Countermeasure ("SPCC") Plan and an Emergency Response Plan ("ERP") in close coordination with the Brockton Emergency Planning Council and Brockton's Fire and Police Departments (Exhs. EFSB-E-1, at B-16; HO-RR-17). The Company indicated that the SPCC plan would focus on the 500,000 gallon fuel oil storage tank and that the ERP would cover other site contingencies including accidental releases of ammonia or bulk water treatment chemicals (Exh. HO-RR-17). The Company submitted an outline for the SPCC plan and stated that the plan would be certified by a Massachusetts certified professional engineer (Exhs. HO-RR-17; EFSB-E-1, at 4-7). The Company indicated that the SPCC plan would include site maps, tank locations and specifications, operating procedures, contact information for emergency coordinators, and an ERP for ammonia spills (id.).

4. Analysis

Brockton Power has stated that all OSHA regulations would be adhered to during construction and operation of the proposed facility and that rigorous safety requirements would be a precondition of contracts for construction and operation of the proposed

facility. The record, however, does not explicitly indicate that the Company would provide site security or take steps to limit unauthorized personnel from accessing the site. The Siting Board therefore directs Brockton Power to provide for facility security and to limit access to the proposed site during construction and operation of the proposed facility.

With respect to chemical storage and handling, the record demonstrates that the Company has designed facilities to avert and minimize spills of hazardous materials. The record indicates that storage tanks for fuel oil, ammonia, and other bulk chemicals would be within diked containment structures and that the ammonia containment system would be enclosed within a building. The record indicates that bulk chemicals would be delivered to bermed areas dedicated for that purpose and that appropriate facilities and procedures would be used to minimize potential spills. Other necessary chemicals would be stored in designated areas using appropriate containers.

The Company has provided modeling results indicating that maximum hourly ground level ammonia concentrations resulting from a catastrophic failure of the ammonia storage tank would be 0.61 ppm, which is well below the toxic endpoint limit of 200 ppm or the odor detection limit of 50 ppm. Thus, even a worst-case release would not result in a ground level ammonia concentration which would be likely to affect the safety of any person beyond the site boundaries or within the site at ground level. Therefore, the Siting Board concludes that Brockton Power has taken all steps feasible at this time to minimize safety risk from ammonia storage.[(65)]

The record indicates that the Company intends to develop a SPCC plan and an ERP similar to those found acceptable in previous Siting Board decisions. These plans, however, have not yet been developed. The Siting Board notes that the proposed facility is located within 2100 feet of the Town of West Bridgewater, and that this Town may have a considerable interest in the contents of the SPCC, the ERP, and other safety plans. Therefore, the Siting Board directs Brockton Power to prepare the SPCC plan and the ERP in consultation with both the City of Brockton and the Town of West Bridgewater

Brockton Power presented modeling results indicating that fogging and rime icing associated with the cooling towers at the proposed facility could be expected to affect offsite areas. Specifically, roadways in Brockton and West Bridgewater near the proposed site could be affected by fog between 2 and 15 hours a year, and cooling tower icing could occur as much as one half hour a year in nearby public areas and 1.2 hours a year adjacent to the site at the Brockton AWRF property. Although the Company claimed that cooling tower icing would occur in conjunction with "background icing", it did not elaborate on this contention nor did the Company propose any mitigation plan for potential icing.[(66)] Therefore, the Siting Board directs Brockton Power to develop and implement a plan for mitigating hazardous roadway and walkway conditions that could result from icing associated with the cooling towers. The icing mitigation plan should be prepared in consultation with the City of Brockton, the Town of West Bridgewater, and potentially affected property owners or occupants and should, at a minimum: (1) identify areas potentially affected by cooling tower icing; (2) characterize meteorological

conditions when icing may occur and under what circumstances mitigation measures would be employed; and (3) describe measures the Company would use to minimize potential icing hazards, including roadway sanding and motorist alerts.

The Siting Board finds that, with implementation of the proposed mitigation and the above conditions, the environmental impacts of the proposed facility would be minimized with respect to safety.

I. Traffic

This Section describes the impact of the construction and operation of the proposed facility on local traffic conditions and outlines proposed mitigation of traffic impacts.

1. Description

Brockton Power indicated that traffic associated with the construction and operation of the proposed facility would use existing roads to enter and exit the site (Exh. BP-1, at 4.12-1). The Company stated that facility operation would have little impact on the traffic conditions in the local area because only 20 workers per day would be traveling to the site (Exh. BP-1, at

4.12-1). The Company estimated truck traffic associated with facility operation at: two to three collection trips per week for waste disposal; approximately one trip per week for ammonia delivery; and, under extreme circumstances, ten oil deliveries a day or 50 deliveries during a week to refill the oil tank (Exhs. EFSB-T-4; EFSB-SW-4; BP-1, at 4.8-2 to 4.8-3).

Brockton Power stated that the only significant traffic associated with the project would be construction traffic and that most of this traffic would travel to the site along Route 24 to the Route 106 exit (Exh. BP-1, at 4.12-1; Tr. 2, at 337-338). The Company indicated that from Route 106 east, the construction traffic would travel north on Route 28, head east onto Sargents Way, and then south to the project site on Industrial Boulevard or Oak Hill Way (id.). The Company asserted that it expects most construction traffic would leave the site by retracing the access route (id.). The Company stated that traffic originating from the City of Brockton would travel to the site on Route 28 southbound, but predicted that this would only be a small proportion of construction traffic associated with the facility (id.). Finally, the Company acknowledged that the site could also be accessed from Plain Street, at the eastern end of Sargents Way, but noted that this would be a direct route only for workers who reside in South Brockton (Exh. EFSB-T-2).

Brockton Power predicted that during the peak construction phase there would be as many as 300 workers traveling to the site by 7:00 a.m. and leaving around 3:30 p.m. (Exh. BP-1, at 4.12-1 to 4.12-2).[(67)] Additionally, the Company indicated that trucks would be delivering supplies throughout the day during the construction phase of the project (id.). The Company determined that existing peak traffic volumes at the Route 28-Sargents Way intersection occur between 7:00 and 8:00 a.m. and between 3:30 and 4:30 p.m. (id.). The Company stated that a morning peak for construction traffic, occurring between 6:00 to 7:00 a.m., would precede the currently observed morning rush hour (id.). However, the Company indicated that peak construction traffic would overlap with the current afternoon peak traffic period (id.).

As part its of traffic analysis, Brockton Power determined Level of Service[(68)] (LOS) ratings for the intersection where Sargents Way terminates at the east side of Route 28 under existing conditions, peak construction traffic conditions, and peak construction traffic conditions with mitigation (See Table 6 for all ratings and delay times) (id. (Table 4-12-2)).[(69)] The Company indicated that under existing traffic conditions, the intersection has an overall LOS rating of F for morning and afternoon traffic peaks (id.). The Company attributed the F rating to long delays (829 to over 1000 seconds under existing conditions) for vehicles turning left from Sargents Way onto Route 28 (id.). The Company also determined that, without mitigation, traffic conditions at this intersection would result in even longer delays for this turning direction (id.). The Company determined that the current rating of the other turning directions at the intersection[(70)] are LOS B and that the addition of construction traffic would result in a worse LOS rating (LOS C) only for the southbound left turn during the morning traffic peak due to an increase in turning delays from 6.1 to 10.3 seconds (id.).

Brockton Power proposed several measures for minimizing the impact of the construction traffic in the vicinity of the proposed facility site (Exh. BP-1, at 4.12-4; Tr. 2, at 340). Specifically, the Company indicated that it would: (1) augment existing traffic control, which consists of a flashing red light facing Sargents Way, by providing a police officer to control traffic at the intersection of Sargents Way and Route 28 during the morning and afternoon peak construction traffic periods;[(71)] (2) contractually require all construction vehicles to approach the

Table 6.

Intersection Travel Direction	**Peak a.m. Traffic LOS/Delay (seconds)**	**Peak p.m. Traffic LOS/Delay (seconds)**
Existing Conditions		
Westbound Left	F/829	F/(greater than 1000)
Westbound Right	B/6.3	B/6.2
Southbound Left	B/6.1	B/6.3

Overall Intersection	F/94	F/293
Construction Period (no mitigation)		
Westbound Left	F/(greater than 1000)	F/(greater than 1000)
Westbound Right	B/7.7	B/6.9
Southbound Left	C/10.3	B/6.4
Overall Intersection	F/347	F/(greater than 1000)
Construction Period (with mitigation)		
Westbound Left	C/23.9	D/25.3
Westbound Right	C/20.6	B/12.9
Southbound Left	A/4.3	B/12.2
Overall Intersection	C/16.7	B/15.0

Table 6. Shows the LOS ratings and delay times that the Company determined for various turning directions at the Route 28-Sargent's Way intersection (Exh. BP-1 (Table 4.12-2)).

site from Route 28; and (3) encourage use of mass transportation by providing a shuttle to the Campello MBTA station and nearby bus stops (id.). The Company claimed that, with the proposed mitigation, the construction traffic to and from the facility would not result in a negative impact on local traffic conditions and that the LOS at the Sargents Way-Route 28 intersection would improve from F to C and B for morning and evening peak traffic, respectively (id.). The current F-rated LOS for the westbound left turn would become a LOS C for the morning peak traffic and LOS D for the evening traffic peak (id.). The Company testified that the City of Brockton has considered signalization of the Route 28-Sargents Way intersection but, to its knowledge, the possibility of a traffic light is still at the discussion stage (Tr. 2, at 342-343).

Brockton Power also described traffic impacts that would be associated with special circumstances (Exh. EFSB-T-4; Tr. 2, at 340 - 342). The Company acknowledged that during construction there would be approximately a half dozen deliveries of oversized loads requiring special trucks and delivery procedures (Tr. 2, at 340-342). The Company indicated that such deliveries would be scheduled for off peak traffic hours and accompanied by a police detail (id.).

2. Analysis

The record shows that the primary traffic routes to the proposed site would be along major roadways, and that no residential roads would be directly affected by traffic for the proposed facility. The Company's traffic analysis demonstrates that LOS F conditions are already present at the closest major intersection to the site (Route 28 and Sargents Way) and that, without mitigation, construction traffic traveling to and from the proposed site would increase the delay times at this intersection.

The Company has proposed traffic mitigation during construction which would improve conditions at the Route 28-Sargents Way intersection to LOS C and LOS D for the morning and afternoon peak periods, respectively. This mitigation includes: (1) an officer directing traffic at the Route 28-Sargents Way intersection during peak periods of construction traffic; (2) encouraging the use of mass transportation by providing a shuttle from nearby train and bus stops; and (3) requirements for commercial vehicles to access the site from Route 28. In addition, the Company has committed to scheduling deliveries of oversized equipment during off-peak traffic hours and would arrange for a police detail to facilitate delivery. Accordingly the Siting Board finds that the environmental impacts of the proposed facility would be minimized with regard to construction traffic impacts.

The Siting Board notes that the Company has proposed traffic mitigation only during the construction period, arguing that facility operation would result in minimal impacts on traffic due to the small number of on-site employees. However, the Siting Board is concerned about the potential impacts on traffic conditions of commercial truck traffic associated with the proposed facility, which could include as many as 10 fuel oil deliveries a day and 50 fuel oil deliveries per week. Given the potential for commercial delivery traffic, the Siting Board is concerned that operation of the proposed facility could exacerbate conditions at the Route 28-Sargents Way intersection, which is already rated at LOS F.

While the record shows that the City of Brockton has discussed the possibility of signalizing the Route 28-Sargents Way intersection, there is no indication of any firm plans for improvements to this intersection. Therefore, the Siting Board directs Brockton Power to work with the City of Brockton Department of Public Works and with the management of other commercial or industrial facilities within the Oak Hill Industrial Park to identify and, if appropriate, promote implementation of plans to improve the Route 28-Sargents Way intersection. A description of an alternative exit route and a narrative outlining the current status of any plans to improve the intersection should be submitted to the Siting Board prior to the start of commercial operation. Until such time as the intersection is improved, the Siting Board also directs the Company to limit oil deliveries and other commercial delivery traffic to off-peak hours except where emergency conditions exist.

Accordingly, the Siting Board finds that, with implementation of proposed mitigation and the above conditions, the environmental impacts of the proposed facility would be minimized with regard to traffic.

J. Electric and Magnetic Fields[72]

1. Discussion

Brockton Power indicated that operation of the proposed facility: (1) would produce electric and magnetic fields associated with the proposed new 115 kV lines which would interconnect the proposed project with transmission lines owned by EUA; and (2) would produce magnetic fields associated with increased power flows on certain existing transmission lines (Exhs. BP-1, at 4.9-1; EFSB-EM-1).[73] The Company indicated that the proposed interconnection would extend via a route traversing part of the Industrial Park and continuing to the southeast along the MBTA ROW, where it would join existing EUA 115 kV lines located in an EUA ROW which extends from Bridgewater substation in Bridgewater into and through portions of West Bridgewater and Brockton and to Auburn Street substation in Whitman (Exhs. EFSB-EL-11 (att); HO-RR-5; HO-RR-20 (atts.)).

The Company initially proposed to construct and operate a single 115 kV transmission line to interconnect the proposed project to EUA's transmission lines, noting that the final interconnection configuration had not been determined (Exh. EFSB-EM-1S (att. at 1-1, 5-1 to

6-3)). According to the recommended interconnect plan presented in the EUA interconnect study, however, the proposed project would be interconnected by bisecting the EUA F-19 line into northern and southern sections, and constructing two new interconnect lines as extensions of the two F-19 line sections to the proposed site (Exh. HO-RR-7S (att. at 3, 10-12)).[74]

The Company indicated that the proposed interconnect line route would include:

(1) a segment along the side of Oak Hill Way opposite from existing commercial uses in the Industrial Park; (2) a segment traversing an occupied commercial property between Oak Hill Way and the MBTA ROW, following an alignment 50 feet from the boundary with property of Tofias Trust; and (3) a segment along the northeast side of the MBTA ROW abutting one residential property and undeveloped wooded land, and opposite from property of Tofias Trust (Exhs. HO-RR-20 (atts.); EFSB-EL-11 (att.); Tr. 1, at 89, 126). The Company estimated that the maximum magnetic field levels from the interconnect line would be 65 milligauss ("mG") and 30 mG at the northeast and southwest edges, respectively, of the MBTA ROW, and would decline to 3-4 mG at a distance of 175 feet from the edges of the ROW (Exh. EFSB-EM-1S (att. at 6-1,

fig. 6.1)). The Company estimated that the maximum magnetic field level at the nearest residence, located 70 feet from the edge of the MBTA ROW near the northwesterly end of the route segment along the MBTA ROW, would be 20 mG (Exh. HO-RR-6).[75]

The Company asserted that, in the course of developing siting plans for the interconnect line, it relocated the proposed route away from the neighborhood of approximately 20 residences along 1100 feet of Appleby Street adjacent to the MBTA ROW, and thereby determined a route that minimizes residential EMF concerns (Company Brief at 66, citing, Tr. 1, at 92-94). The Company stated that it also considered the option of siting the interconnect line underground in response to a Siting Board staff request, but concluded that an underground alignment would cost $3 million, or five times the $600,000 cost of the proposed overhead alignment, and that therefore the Company did not further consider an underground alignment (Company Brief at 70, citing, Exhs. EFSB-EL-5, EFSB-EL-10).

With respect to EMF impacts along existing transmission lines, the Company stated that the EUA ROW passing the proposed interconnect point is 125 feet wide and is occupied by three 115 kV circuits, including: (1) two lines on a set of double circuit poles along the west side of the ROW, the F-19 and G-18 lines; and (2) one line on a set of H-frame transmission structures along the east side of the ROW, the E-20 line (Exhs. EFSB-EM-1S (att. at 6-1, fig. 5.2)).[(76)] To assess EMF changes resulting from the operation of the proposed facility, the Company provided: (1) measurements of existing magnetic fields taken in February 1999 at two nearby street crossings of the EUA ROW, north and south of the interconnect point, under load conditions in which the aggregate power flow on the E-20, F-19 and G-18 lines was 80 to 82 megavolt-amperes ("MVA"); and (2) calculations of future magnetic fields along the EUA ROW for an assumed transmission scenario in which the aggregate power flow on the E-20, F-19 and G-18 lines just equaled the proposed project's output (id. at 4-4, 4-5, 5-1 to 5-2).

The Company indicated that the maximum measured magnetic field levels along the EUA ROW were 20 mG directly under the double circuit lines, declining to 18 mG and 4 mG at the west and east edges of the ROW, respectively (Exh. EFSB-EM-1S (att. at 4-4 to 4-5, figs. 4.2, 4.3)). The Company also identified the nearest residential locations along each side of the ROW, including a residence directly adjacent to the east edge at Vital Street in West Bridgewater, and a residence 15 feet from the west edge at Litchfield Terrace in Brockton (Exh. HO-RR-6).[(77)]

With operation of the proposed project, the Company indicated that the maximum magnetic field at the edge of the ROW would be 51 mG, assuming a power flow of 270 MW distributed in equal shares to the E-20, F-19 and G-18 lines (id.; Exh. EFSB-EM-1S

(att. at 5-2, 6-2). The Company noted that the F-19 and G-18 lines, which occupy the double-circuit poles along the west side of the EUA ROW, are presently designed with phase configurations that minimize magnetic field levels (Exh. HO-RR-8; Tr. 1, at 121). However, the Company did not provide separate magnetic field estimates for the east and west edges of the EUA ROW. In addition, the Company did not provide updated magnetic field estimates based on the interconnect plan in the EUA interconnect study, under which the Brockton Power plant would be interconnected only to the F-19 line.[(78)]

Tofias Trust argued that Brockton Power failed to provide accurate and complete evidence as part of its EMF analysis, and in particular that it failed: (1) to demonstrate that its EMF modeling for the proposed facility, using the FIELDS model, is state-of-the-art and accurate; and (2) to submit accurate and complete evidence concerning power flows along existing transmission lines and the details of its proposed interconnection (Tofias Trust Brief at 7-10). With respect to use of the FIELDS model, Tofias Trust argued Dr. Valberg did not evaluate the model's ability, relative to other available software, to predict EMF impacts under real-life conditions (id. at 7-8).[(79)] With respect to evidence concerning power flows and interconnection details, Tofias Trust argued that Dr. Valberg developed his analysis of EMF levels without knowing the actual interconnect configuration, and therefore made faulty assumptions, specifically that: (1) future power flow would be evenly distributed over the E-20, F-19 and G-18 lines; and (2) future current would be balanced on the proposed interconnect line (id. at 8-10). Tofias Trust also argued that the Company's EMF analysis was flawed because:

(1) the Company measured EMF levels at an ambient temperature of 40 degrees Fahrenheit, a condition not likely to yield a peak field level; and (2) Dr. Valberg modeled EMF impacts of the proposed interconnect line assuming a transmission structure height of 79 feet, rather than the height of 74 feet set forth in the Petition (id. at 14).

With respect to evaluation of EMF impacts, Tofias Trust argued that Brockton Power both failed to show that its modeled EMF levels are acceptable, and inappropriately urged the Siting Board to "retreat to its conclusions about EMF" in Massachusetts Electric Company et al., 13 DOMSC 119 (1985) ("1985 MECo/NEPCo Decision"), rather than evaluate EMF impacts based on current research (id. at 12-14). Tofias Trust also argued that Brockton Power failed to produce sufficient evidence concerning mitigation of EMF impacts, and further that siting the proposed interconnect line underground would be a superior, cost-effective means of mitigating EMF impacts (id. at 15-19). Citing discrepancies with cost estimates from two previous Siting Board reviews of transmission lines, Tofias Trust argued that Brockton Power's estimated cost for underground construction is highly suspect (id. at 18-19).[(80)]

The Company argued that it has properly calculated EMF levels, and has proposed use of cost-effective measures to ensure EMF impacts are minimized (Company Reply Brief at 4-7). The Company argued that: (1) the FIELDS model is widely accepted, and Tofias Trust did not explain how the model could accurately implement the laws of physics and still be inaccurate;

(2) the Company made appropriate power flow assumptions given its discussions with EUA;

(3) the results of the Company's EMF analysis were not significantly affected by its use of EMF measurements taken at 40 degrees Fahrenheit or its assumption that the interconnect line structures would be 79 feet high; (4) it is unnecessary for the Siting Board in this case to reevaluate its precedent on EMF established in the 1985 MECo/NEPCo Decision, or establish a new EMF standard; (5) there is no basis for

Tofias Trust's comparison of the Company's estimated cost for underground construction to unadjusted 1991 costs for similar construction in a previous Siting Board review; and (6) the Company has adequately considered and committed to implement measures to mitigate EMF, and demonstrated that siting the proposed interconnect line underground would not be a cost-effective means of mitigation in this case (id. at 7-11, 13-20).

2. Analysis

In a previous review of proposed 345 kV transmission line facilities, the Siting Board accepted edge-of-ROW levels of 1.8 kV/meter for the electric field and 85 mG for the magnetic field. 1985 MECo/NEPCo Decision, 13 DOMSC 119, at 228-242. In later reviews of proposed electric facilities, the Siting Board has compared estimates of EMF impacts to the edge-of-ROW levels accepted in the 1985 MECo/NEPCo Decision. Sithe Edgar Decision, EFSB 98-7,

at 104; IDC Bellingham Decision, EFSB 97-5, at 97; Hingham Municipal Lighting Plant,

14 DOMSC at 7, at 28 (1986).

Tofias Trust argues that the Siting Board should evaluate EMF impacts based on current research, and not rely on a comparison to conclusions in the 1985 MECo/NEPCo Decision to determine if EMF impacts are acceptable. As an initial matter, the Siting Board stated in a recent review that its reference to the edge-of-ROW magnetic field level of 85 mG in the

1985 MECo/NEPCo Decision serves as a benchmark of a previously accepted impact along a 345 kV transmission line in Massachusetts, not as a limit of acceptable impact.

Sithe Mystic Decision, EFSB 98-8, at 71. In addition, as part of its review of cumulative health impacts in accordance with recent statutory requirements, the Siting Board does inquire into current research regarding possible health impacts of EMF in electric facility cases. We note that, in its reviews of possible health impacts of EMF in this and other recent cases, the Siting Board has not found that evidence based on current research significantly brings into question the conclusions the Siting Board reached in the 1985 MECo/NEPCo Decision regarding EMF impacts relating to health.

The Siting Board thus affirms that its comparison of EMF levels in electric facility reviews to levels accepted in the 1985 MECo/NEPCo Decision provides a useful benchmark, representative of transmission ROWs in Massachusetts developed to provide 345 kV transmission. At the same time, we point out that those previously accepted EMF levels are not a standard limiting acceptable impacts, and do not provide the sole or principal basis for our evaluation of EMF impacts in current reviews.

Here, the record shows that off-site electric and magnetic fields would remain below the levels found acceptable in the 1985 MECo/NEPCo Decision. Although consistent with edge-of-ROW levels previously accepted by the Siting Board, the estimated maximum magnetic field levels with operation of the proposed project would be 65 mG along the edge of the MBTA ROW, where occupied by the interconnect line, and 51 mG along the edge of the EUA ROW. The estimated magnetic field levels appear to represent significant increases for both the interconnect line corridor, along which transmission lines do not presently run, and the EUA ROW, along which the maximum existing edge-of-ROW level measured by the Company was 18 mG.

As argued by Tofias Trust, given that the record does not indicate that Brockton Power and EUA have determined and agreed to a final interconnection plan, the interconnection configuration assumed in the Company's EMF analysis may differ from that which is implemented, consistent with a final interconnection agreement. With respect to the interconnect line, the Company has proposed to construct a single transmission line between the site and the EUA ROW; however, in the project interconnect study completed after the close of hearings, EUA recommended installation of a double circuit transmission line and on-site ring bus to interconnect the project. With respect to the point of interconnection to EUA's lines, the Company has assumed a configuration allowing for equal allocation of resulting power flow over the E-20, F-19 and G-18 lines, but EUA recommended in the project interconnect study that the project be interconnected to only the F-19 line.

The record shows that the maximum magnetic field from the proposed interconnect line would be 20 mG at the nearest residence, up to 30 mG on property of Tofias Trust abutting the southwest side of the MBTA ROW, and up to 65 mG in other areas of undeveloped land along the northeast side of the MBTA ROW. Maximum electric field from the proposed interconnect line would be 0.02 kV per meter at the nearest residence, up to 0.05 kV per meter on property of Tofias Trust abutting the MBTA ROW, and up to 0.5 kV per meter in other areas along the northeast side of the MBTA ROW. As discussed above, the interconnect configuration has not been finally determined, and therefore the EMF impacts may differ from those estimated by the Company. The Siting Board notes that, based on the design and alignment of the proposed single-circuit interconnect line as set forth in the record, it appears EMF impacts on abutting property with construction of a double-circuit line could be either higher or lower than the Company's estimates for a single-circuit line, depending on design considerations and on the particular location of abutting property in relation to the line.[(81)]

The record shows that the Company initially proposed an interconnect line route that would have exited the industrial park directly to the MBTA ROW at a point northeast of the plant site, but modified its routing to make maximum use of the Oak Hill Way in the Industrial Park, and thereby reduce possible impacts on residences along Appleby Street abutting the MBTA ROW. The proposed route as revised still would abut one of the residences on Appleby Street, at the northwestern end of the segment along the MBTA ROW, but otherwise would not be proximate to residences or other sensitive uses. The Siting Board finds that the currently proposed interconnect line route would best limit

residential exposure to EMF impacts, and that therefore EMF impacts would be minimized with use of the Company's currently proposed route for the project interconnect line.

With respect to the alternative of siting the interconnect line underground, Tofias Trust argued that the Company had overstated the cost of underground lines and that burying the lines would avoid the estimated EMF impacts. The Company did not dispute that such siting would substantially avoid increases in EMF levels along the interconnect route, but argued that concerns about health impacts of EMF are not substantiated and that the estimated $3 million cost would not be warranted.

Regarding Tofias Trust's argument that the Company's estimated cost for underground construction is suspect, the Siting Board agrees with the Company that unadjusted cost estimates from previous Siting Board reviews are not directly comparable to the Company's cost estimate in this review. Although Tofias Trust cites a cost differential of $1 million per mile for underground construction, compared to overhead construction, this figure was taken from an analysis in a past review based on 1988 cost levels. 1991 NEPCo Decision, 21 DOMSC at 394. Although clearly less than the fivefold increase of $3.6 million per mile used by Brockton Power in its 1999 analysis, the 11-year old cost differential still represents more than a twofold increase over Brockton Power's assumed cost of $0.9 million per mile for overhead construction before any adjustment for cost escalation, and if adjusted for cost escalation of at least 3 percent per year would indicate a cost for underground construction of at least 2.5 times that assumed by Brockton Power for overhead construction. In addition, in another previous Siting Board review of proposed 115 kV transmission construction from a comparably earlier period, a significantly larger cost differential for underground construction of $1.4 million per mile is identified as part of a cost analysis based on 1987 cost levels. Commonwealth Electric Company, 17 DOMSC 249, 297, 303-304 (1988) ("1988 Commonwealth Decision").[(82)] Thus, a fair reading of cost data from previous Siting Board reviews suggests that there is a significant cost multiple associated with placing 115 kV transmission lines underground. Regarding the merits of underground siting in this case, it is not disputed that such siting would reduce EMF levels. However, as discussed in Section III.L.6 below, available research studies do not establish that there is a cause-and-effect relationship between EMF from power lines and adverse health effects. In addition, the Siting Board has found, above, that the Company chose an interconnect line route that would best limit residential exposure to EMF impacts from the line, and thereby minimize EMF impacts. Given that the currently proposed route is primarily in industrial areas, we conclude that the significant additional cost of underground siting is not justified based on our analysis of EMF impacts. Accordingly, the Siting Board finds that the alternative of siting the interconnect line underground would not be consistent with achieving minimum environmental impacts, consistent with the minimization of costs of mitigating, controlling and reducing such impacts.

The Siting Board notes that its findings regarding the proposed interconnect line are based on the Company's analysis, which assumed construction of a single 115 kV line. If there is a significant change in the Company's proposed interconnect line, including the

possible change of using a double-circuit interconnect line configuration as recommended in EUA's interconnect study, Brockton Power must inform the Siting Board of such change in order that the Siting Board may determine whether to inquire further into the matter.[(83)]

With respect to EMF impacts along existing transmission lines, the record shows that EUA's F-19 and G-18 lines are carried on double-circuit transmission structures using a conductor phase configuration that minimizes magnetic fields. Although the Company provided magnetic field estimates for an assumed transmission scenario, the Siting Board notes that there is the potential for circuit-specific power flows and related magnetic field levels to differ significantly from those that the Company assumed. First, as argued by Tofias Trust, there is little basis for the Company's assumption that power flows would be balanced among the circuits on the EUA ROW. Second, there appear to be significant differences between future transmission scenarios that would be likely, consistent with recommendations in the EUA interconnection study, and the transmission scenario that the Company assumed for purposes of its EMF analysis.

Given the uncertainty regarding the interconnection configuration to be used, and potential changes in magnetic field levels that could result, the Siting Board wishes to remain informed as to the progress and outcome of plans to interconnect the proposed project. Therefore, the Siting Board directs Brockton Power to provide the Siting Board with an update on: (1) the extent and design of required transmission upgrades; (2) the measures incorporated into the transmission upgrade designs to minimize magnetic field impacts; and (3) the resulting magnetic field levels at the edge of the EUA ROW based on the transmission upgrade design and most likely load flow scenario. Brockton Power shall provide such information to the Siting Board when it reaches final agreement with all transmission providers regarding transmission upgrades.

Accordingly, the Siting Board finds that with the Company's pursuit of cost-effective designs for decreasing magnetic fields along the affected transmission lines that require upgrades, the environmental impacts of the proposed facility would be minimized with respect to EMF impacts.

K. Land Use

This section describes the land use impacts of the proposed facility, including the impacts to significant cultural resources and wildlife species and habitats.

1. Description

Brockton Power asserted that the proposed facility would be consistent with zoning, existing land uses, and planned land uses (Exh. BP-1, at 4.2-6). The Company indicated that the proposed facility would be constructed on a 13.2 acre parcel within the 70 acre Oak Hill Way Industrial Park (Exh. BP-1, at 4.2-1). The Company described the land uses bounding the site as warehouse and manufacturing facilities to the north and east,[(84)] the Salisbury Plain River to the west, and the Brockton AWRF to the south (id.). The Company indicated that the gas pipeline interconnect would extend for 1500 feet within the ROW for Industrial Boulevard, while the electrical interconnect would be approximately 3500 feet in length and would extend along existing roadways, across an industrial property to the MBTA ROW, and then along the MBTA ROW to the EUA 115 kV line (Exhs. BP-1, at 1-24; HO-RR-20 (a) (att.)).

Brockton Power stated that the zoning of the site, Heavy Industry (I-3), is appropriate for the proposed facility (Exh. BP-1, at 1-11). In support of this statement, the Company submitted a copy of the City of Brockton's zoning ordinances, which showed that an electric power generating facility is a permitted use in areas zoned for Heavy Industry I-2 and I-3 (Exh. EFSB-S-2). The Company noted, however, that because the proposed facility's exhaust stack, HRSG building, and air intake system would be taller than 60 feet, the Company needed a height variance from the Brockton Zoning Board of Appeals in order to build these structures (Exh. BP-1, at 4.2-1). Brockton Power stated that on February 19, 1999, it received the necessary height variance from the Brockton Zoning Board of Appeals (Exh. EFSB-S-2).

Brockton Power indicated that the properties bordering the facility to the south and east also are zoned I-3, while the properties to the north and across the Salisbury Plain River to the west are zoned General Commercial (C-2) (id. at 4.2-1 to 4.2-3). The Company stated that the nearest existing residential areas are 1500 feet to the east and 1100 feet to the west of the proposed site and are separated from the site by existing commercial or industrial development (Exh. BP-1, at 1-12 to 1-13). The Company stated that the nearest undeveloped residentially zoned property is 880 feet to the east of the proposed facility site and is likewise separated from

the site by existing industrial and commercial facilities (Exh. EFSB-EL-3).

Brockton Power stated that the proposed site was previously graded and filled, so that the site has been essentially stripped of vegetation except in some wetland resource areas (Exh. BP-1, at 4.2-1, 4.2-7). The Company determined that, prior to development of the industrial park, the site was mined for sand and gravel and has been largely devoid of trees since the mid-1970's (Exh. EFSB-S-1). An aerial photograph submitted by the Company shows that the preferred electrical interconnection route could require minimal tree trimming along Oak Hill Way and the MBTA ROW (id., EFSB-EL-11 (att.)). From a review of site aerial photograph, it appears that the Company's proposed route for the wastewater supply and return line could also require minor tree clearing (Exhs. EFSB-E-3 (att. (e)(5)); BP-1 (fig. 1-4)).

Brockton Power submitted a Massachusetts Geographic Information System ("MGIS") map showing land uses surrounding the proposed site (Exh. BP-1 (fig. 4.2-1)). Major land uses within one-half mile of the site are shown as forest, open land, commercial, and industrial land uses, with lesser areas of residential, waste disposal, and transportation land uses (id.). Within an area one mile from the proposed site, the land uses surrounding the facility are shown as a majority forest, residential, and commercial with industrial and open land concentrated within one-half mile of the facility (id. (fig. 4.2-1)). On the MGIS map, the Oak Hill Industrial Park is shown as forest, but the Company indicated that the majority of this land was previously cleared for the industrial park (id. at 4.2-3). The Company did not report any other discrepancies with the GIS mapping.

To assess the potential impacts of the proposed facility on cultural resources, Brockton Power reviewed the files of the Massachusetts Historical Commission ("MHC") and determined that the nearest site listed on the National Historic Register is over one-half mile from the proposed site (Exh. BP-1, at 5.2-1). The Company also submitted verification from the MHC stating that the proposed project is unlikely to affect significant historic or archeological resources (id.).

For its Notice of Intent to the Brockton Conservation Commission, the Company reviewed the 1997-1998 Massachusetts Natural Heritage Estimated Habitat Map (Brockton Quadrangle) and determined that the proposed site was not within the estimated habitat of any rare or endangered species (Exh. EFSB-E-3 (a) (att.) at 3-3)).

2. Analysis

As part of its review of land use impacts, the Siting Board considers the extent to which a proposed facility would be consistent with existing land uses, state and local requirements, and policies or plans relating to land use. The Siting Board also considers the potential impacts of the project on terrestrial resources including vegetative cover and habitat.

Here, the record indicates that the proposed site is located within a designated industrial park, is zoned for heavy industry, and the proposed facility is an allowed use for this site. The Company has received the height variance necessary to construct the proposed facility.

The record further indicates that the area within a one-half mile radius of the proposed site includes forest, open, commercial, and industrial land with lesser amounts of residential and other land uses. The record demonstrates that the proposed site is surrounded on all sides by existing industrial and commercial facilities and that these existing facilities separate the proposed site from the nearest residential areas or areas potentially available for residential development. Accordingly, the Siting Board concludes that the proposed facility is consistent with surrounding land uses and zoning.

The Company has adequately considered the impacts of the proposed facility with respect to vegetative cover, wildlife species and habitats, and historic and archeological resources. Based on its review of the information submitted by the Company, the Siting Board concludes that, with the exception of the minimal tree trimming or clearing associated with the electrical interconnect[(85)] and the wastewater interconnect, no land resource impacts are likely to occur as a result of construction or operation of the proposed facility.

Accordingly, the Siting Board finds that the environmental impacts of the proposed facility at the proposed site would be minimized with respect to land use impacts.

L. Cumulative Health Impacts

This section describes the cumulative health impacts of the proposed facility. The Siting Board considers the term "cumulative health" to encompass the range of effects that a proposed facility could have on human health through emission of pollutants over various pathways, as well as possible effects on human health unrelated to emissions of chemical pollutants (e.g., EMF or noise effects). The Siting Board considers these effects in the context of existing background conditions, existing baseline health conditions, and, when appropriate, likely changes in the contributions of other major emissions sources.

The analysis of the health impacts of a proposed generating facility is necessarily closely related to the analysis, in sections above, of specific environmental impacts which could have an effect on human health and any necessary mitigation measures. This section sets forth information on the human health effects that may be associated with air emissions, including criteria pollutants and air toxics, emissions to ground and surface waters, the handling and disposal of hazardous wastes, EMF and noise; describes any existing health-based regulatory programs governing these impacts; and considers the impacts of the proposed project in light of such programs.

1. Baseline Health Conditions

Brockton Power stated that it was aware of one study published in the last ten years that addressed health concerns for the City of Brockton or the Plymouth County region (Exh. EFSB-H-2).[(86)] The Company provided a summary of this report, which was published by the Massachusetts Department of Public Health in 1997 and is titled Cancer Incidence in Massachusetts 1987-1994 ("Cancer Incidence Report") (id.). The Cancer Incidence Report compares the incidence rate of 22 types of cancer for each of the 351 Massachusetts cities and towns with the state-wide average for males, females, and the total population, and notes statistically significant deviations (id.). In Brockton, the

Cancer Incidence Report finds elevated levels (significant at p <= 0.001) of cervical cancer in women as well as excesses in oral cancer, bladder cancer, and lung cancer (significant at p <= 0.05) (id.).[(87)] The Company noted that overall cancer rates in Brockton are identical to the statewide average, and emphasized that the Cancer Incidence Report included a cautionary statement that statistical significance does not necessarily imply biological or public health significance (id.).

2. Criteria Pollutants

As discussed in Section III. B. 1, above, the MDEP regulates the emissions of six criteria pollutants under NAAQS: SO_2, PM-10,[(88)] NO_2, CO, O_3, and Pb. The Company's witness, Dr. Valberg, stated that the criteria pollutants are associated with respiratory diseases (Tr. 1, at 155-158). Dr. Valberg further stated that SO_2 primarily affects asthmatics and can aggravate pre-existing conditions; that high concentration of NO_2 can damage lung tissue; that Pb can have neurological effects; and that particulate matter is a respiratory irritant which, at high levels may be related to respiratory tumors (id.).

Brockton Power indicated that the EPA's NAAQS standards for each criteria pollutant are health based (Tr.1, at 137-139). The Company stated that the resulting standards are designed to protect the health and welfare of the public from the adverse effects of air pollution and protect the public from an anticipated adverse effects associated with the presence of air pollutants (Exh. HO-RR-4 (att. at 3-3 to 3-4)). The Company provided data from MDEP monitoring stations in Boston, Chelsea, Easton, Waltham, Quincy, and Scituate (Exh. HO-RR-4 (att. at 5-17 to 5-18)). This data indicated that: (1) the maximum recorded concentrations of CO in the area were 52 percent of the 8-hour NAAQS standard and 19 percent of the 1-hour standard; (2) the maximum annual average concentration for NO_2 was 58 percent of NAAQS in Boston, but during 1997 and 1998, NO_2 was 17 percent of NAAQS in Easton, which is the monitoring station closest to the site; and (3) maximum concentrations of Pb, SO_2, and PM-10 were below 50 percent of the NAAQS standard for all averaging periods (id.).

The Company indicated that new sources of criteria pollutants, such as the proposed project, may not cause or contribute to a violation of the health-based NAAQS (Exh. HO-RR-4 (att. at 3-1)). The Company stated that, in order to identify new sources with the potential to significantly affect ambient air quality, the EPA and MDEP have adopted SILs for each criteria pollutant; new sources with emissions above SILs are required to conduct interactive source modeling of their emissions (id. at 3-5). The Company submitted modeling results which indicate that the proposed facility's emissions would be below applicable SILs for all criteria pollutants (id. at 6-8 to 6-12).

Although interactive modeling was not required for this project, the Company identified other nearby significant sources of air pollutant emissions (Exh. EFSB-H-10). The Company indicated that the other significant sources were relatively distant and minor so

that any interactive impacts resulting from the proposed and existing pollution sources would be very small (Tr. 1, at 153-154). In addition, the Company conducted a backout analysis and asserted that the operation of the facility would result in net reductions of NO_X, SO_2 and CO_2 in Massachusetts of approximately 2,709 tpy, 9,872 tpy and 708,548 tpy, respectively (Exh. EFSB-EA-1).

The record indicates that the EPA has established ambient air quality standards, called NAAQS, for six criteria pollutants - SO_2, PM-10, NO_2, CO, O_3, and Pb. These standards are designed to be protective of human health, including the health of sensitive subgroups such as the elderly, children, and asthmatics, with an adequate margin for safety. The Siting Board gives great weight to these standards as indicators of whether incremental emissions of criteria pollutants will have a discernable impact on public health.

The record also shows that MDEP has defined standards for reviewing the compliance of proposed new sources of criteria pollutants, such as the proposed project, with NAAQS. Specifically, new sources may not cause or contribute significantly to a violation of NAAQS. In addition, as discussed in Section III. B, above, MDEP requires major new sources to meet BACT when the area is in attainment or is unclassifiable for a particular pollutant or LAER when the area is in non-attainment for a particular pollutant. The Siting Board notes that MDEP's new source program balances environmental impacts and costs when an area is in compliance with NAAQS, but requires stronger measures, including emissions offsets greater than 100 percent, when an area is in non-attainment. The Siting Board finds that this approach is consistent with its own mandate to minimize both the environmental impacts and costs of proposed generating facilities. The Siting Board therefore gives great weight to compliance with MDEP air quality programs as an indicator of whether the Company has minimized the health impacts of a proposed facility.

In this case, the record shows that the Brockton area in Plymouth County presently is: (1) unclassified or in attainment for NO_2, SO_2, PM-10, CO and Pb, with regional background levels of less than 52 percent of the ambient standard for all pollutants and averaging periods; and (2) in serious non-attainment for ozone. Thus, levels of all criteria pollutants in the Brockton area, except O_3, are within the standards set to protect human health. In addition, the Company has shown that the proposed project's emissions of all criteria pollutants would be below the SILs. The Siting Board concludes that there is no evidence suggesting that the proposed project's emissions of SO_2, PM-10, NO_X, CO, and Pb would have a discernable impact on public health.

With respect to concerns raised about the health impacts of multiple sources of pollution in the Brockton area, the Company's assessment is that the cumulative impact of the proposed and existing facilities would be minimal. The Company has committed to meeting BACT or LAER, as applicable, and to obtaining offsets for its NO_X and SO_2 emissions as required. Consequently, based on its compliance with MDEP air quality standards, the Siting Board finds that the cumulative health impacts of criteria pollutant emissions from the proposed facility would be minimized.

3. Air Toxics

Air toxics, or hazardous air pollutants, are pollutants known or suspected to cause cancer or other serious health effects such as birth defects or reproductive effects. Toxics include chemicals such as arsenic, beryllium, lead, mercury, nickel, and formaldehyde (Exh. HO-RR-4 (att. at Table 6.5-3)).

The Company indicated that, for air toxics, the MDEP has developed ambient air quality standards which are intended to protect public health (Exh. EFSB-H-3). The program sets AALs for a broad range of chemicals through a three-stage process (Exh. HO-RR-10 (att. at viii-ix)). First, a Threshold Effects Exposure Limit ("TEL") which is protective of public health from threshold effects is established (id. at viii). Next, a Non-threshold Effects Exposure Limit ("NTEL") is derived (id.). Finally, the lower of the TEL and the NTEL is selected as the AAL (id.). Where carcinogenicity is the most sensitive effect, and adequate data is available to derive a cancer unit risk, the AAL is set to correspond to an incremental lifetime risk of developing cancer of one in one million (id. at ix). The Company asserted that AALs and TELs were designed to ensure that contributions from a single source would have an insignificant impact on public health (Exh. EFSB-H-3).

Brockton Power provided an abstract of a 1998 study by the EPA entitled "Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units - Final Report to Congress" ("HAPs Study") (Exh. EFSB-H-1). The HAPs Study assessed the hazards and risks due to inhalation exposure to 67 hazardous air pollutants ("HAPs") from 684 fossil fuel plants nation-wide (id.). The HAPs study also included multipathway assessments for the four highest-priority HAPs - arsenic, mercury, dioxins, and radio nuclides (id.). The HAPs study eliminated gas-fired power plants from its analysis at the screening stage, noting that "[t]he cancer risks for all gas-fired plants were well below one chance in one million ... and no noncancer hazards were identified" (id.). Based on the EPA's findings, the Siting Board concludes that, in the absence of project-specific evidence to the contrary, the air toxics emissions from a gas-fired generating facility should be considered to have no discernable public health impacts.

Although Brockton Power proposes to use natural gas as the primary fuel for its proposed facility, it does intend to seek permits to use oil as a back-up fuel for up to 720 hours per year. As noted in Section III.B, above, even with the assumption that the facility operates for 720 hours with oil burning, the proposed project's emissions of all and regulated air toxics would be below TELs and AALs, which are designed to be protective of public health. In addition, there is no evidence in the record suggesting that the proposed project would emit any specific air toxic at levels which would affect public health. Consequently, the Siting Board finds that the air toxics emissions from the proposed project would have no discernable public health impact.

The proposed project would use treated effluent for cooling water; therefore Brockton Power has assessed potential impacts associated with odor and airborne impurities from the wet mechanical cooling towers (Exhs. EFSB-EU-7; EFSB-EU-8). The Company indicated that the cooling towers would not emit airborne impurities because the water used in the cooling towers would be disinfected and treated at the AWRF and/or at the proposed facility (id.). In

Section III. B, above, the Siting Board notes that in previous reviews of facilities using sanitary waste water for cooling, it has found that the facilities would have acceptable air impacts and no other adverse impacts. Accordingly, the Siting Board finds that air emissions associated with use of sanitary waste water for cooling water would have no discernable public health impacts.

4. Discharges to Ground and Surface Waters

The Company identified two water-linked pathways by which substances hazardous to human health could theoretically reach the local population: through stormwater discharges that infiltrate groundwater used to supply potable water, and through wastewater discharges to surface water bodies (Exhs. EFSB-H-3; EFSB-H-4; EFSB-H-5; EFSB-H-6; Tr. 1, at 164 -165). Although the Company presented information indicating that the proposed site is within a wellhead protection area for an emergency well and is within 1100 feet of private wells, it also indicated that there is no active municipal well within one half mile of the site (Exhs. BP-1 (fig. 4.4-3); HO-RR-12). The Company stated that the potential for pollutant releases through stormwater runoff is regulated by MDEP under its Stormwater Management Policy, and indicated that it would design the stormwater management system in compliance with the MDEP's best management practices (Exh. EFSB-H-3). The Company indicated that during construction, storm water management would take place in accordance with an NPDES storm water protection plan and that requirements of the Brockton Conservation Commissions Order of Conditions would adequately protect ground water (Exhs. EFSB-H-4; EFSB-E-1, at B-10).

As discussed in Section III. C. 1, above, the proposed facility would generate a wastewater stream of between 208,000 and 225,000 gpd, which would be discharged to the Brockton AWRF (Exh. BP-1, at 1-22 to 1-23). The Company stated that wastewater entering the sewer system would meet all pretreatment standards for discharges to the AWRF (Exh. EFSB-E-1, at B-20).

In Sections III. C and III. D, above, the Siting Board determined that although the Brockton Power facility was within a potential water supply area, the Company had demonstrated that with compliance with stormwater management standards, wastewater management standards, the Brockton Conservation Commission Order of Conditions, and with the implementation of a condition regarding groundwater protection, the proposed

facility's impacts to the ground and surface waters would be minimized. In addition, the Siting Board has found that the wastewater impacts of the project would be minimized due to pretreatment standards and limited quantities of facility discharge. Consequently, the Siting Board finds that the project, as proposed, poses no health risks related to the contamination of potable groundwater or the disposal of wastewater.

5. Handling and Disposal of Hazardous Materials

As discussed in Section III.H, above, the proposed project would use 19 percent aqueous ammonia for NO_x control, and limited amounts of lubricating oils and certain other industrial chemicals for project operation and for treatment of makeup water, HRSG feedwater, and cooling water (Exh. BP-1, at 4.8-3 to 4.8-4). In addition, the Company would store fuel in an on-site 500,000 gallon tank, with deliveries to be made primarily by tank truck (id.).

In Section III.H, above, the Siting Board reviewed the Company's plans for storage and handling of hazardous materials, including aqueous ammonia, and its plans for minimizing and responding to accidental releases of oil or other hazardous materials. The Siting Board determined that aqueous ammonia and other non-fuel chemicals would be properly managed and stored; that in the event of an ammonia tank failure, ammonia concentrations would be well below the toxic endpoint at the property boundaries; and that the Company is prepared to respond effectively to an accidental release of hazardous materials. The Siting Board also determined that the Company would employ appropriate measures to ensure the safe transport and delivery of oil, to prevent oil spills and accidents, and to respond quickly and effectively to any spills that occur.

The Company has demonstrated that it has in-place procedures for the proper handling, storage, and disposal of hazardous materials during construction and operation of the proposed facility. In addition, the Company has demonstrated that ammonia concentrations from a accidental spill would be below levels hazardous to public health at the property boundaries, and that accidental spills of other hazardous materials could be contained at the source and therefore would not affect public health. Consequently, the Siting Board finds that the health risks from the proposed project related to the handling and disposal of hazardous materials would be minimized.

6. EMF

As discussed in Section III. J, above, Brockton Power estimated that worst-case magnetic field levels resulting from the transmission interconnection would be 65 mG at the northeast edge of the MBTA ROW, declining to 20 mG at the nearest residence (Exhs.

EFSB-EM-1 (att. 6-1, fig. 6.1); HO-RR-6). The Company estimated that magnetic field levels along existing transmission lines would increase from the maximum measured level of 18 mG to 51 mG at the edge of the ROW (Exh. EFSB-EM-1 (att. at 4-4 to 4-5, 5-2 ,6-2, figs. 4.2, 4.3)).

The possible health effects of exposure to EMF have been a subject of considerable debate. In a 1985 case involving the construction of the 345 kV overhead HydroQuebec line, the Siting Board heard expert testimony, reviewed the existing literature, and concluded that there was no affirmative evidence that the proposed facilities, which had edge-of-ROW levels of 85 mG, would produce harmful health effects. 1985 MECO/NEPCO Decision, 13 DOMSC 119, at 240. In this case, the Company has provided a summary of existing state and non-regulatory guidance regarding exposure to EMF, noting that the federal government has set no standards for such exposure (Exh. BP-1, at 4.9-4 to 4.9-5; (Table-4.9-2)). The Company stated that the International Radiation Protection Association recommends that occupational exposure be limited to magnetic fields below 5000 mG; that routine exposure for the general public be limited to 1000 mG; and that general public exposure to fields between 1000 and 10,000 mG be limited to a few hours per day (id. at 4.9-4). The Company also stated that the American Conference of Governmental Industrial Hygienists had established a Threshold Limit Value ("TLV") level of 10,000 mG to which nearly all workers may be exposed repeatedly without adverse health effects (id.). The Company indicated that eight states have adopted EMF guidelines which are generally based on levels in existing transmission corridors; the maximum permissible levels for magnetic fields under those guidelines range from 150 mG (for a 230 kV line in Florida) to 250 mG (for a 500 kV, double circuit line in Florida) (id. at (Table 4.9-2)).

The Company's witness, Dr. Valberg, asserted that, although the issue remains controversial, the weight of the evidence from recent studies casts doubt on the hypothesis that power line electric and magnetic fields cause human health effects (Exh. EFSB-1, at 1074). In support of this assertion, Dr. Valberg provided or summarized a number of recent reports and studies in the area (Exhs. EFSB-1; HO-RR-21). First, Dr. Valberg described a 1997 report by the National Research Council ("NRC Report"), which provides a comprehensive review of research up to that date on the biologic effects of exposure to power-frequency electric and magnetic fields, including cellular and molecular studies, studies on whole animals, and epidemiological studies (Exh. EFSB-1, at 1075-1078).[(89)] He noted that the report concludes that the current body of evidence does not show that exposure to such fields presents a human health hazard (id. at 1077). He stated that the report concluded that existing epidemiological studies did not provide sufficient evidence to link magnetic field exposure any human health effect, with the possible exception of childhood cancers (id. at 1078). He also indicated that the report reviewed laboratory studies, some of which found physiological effects from magnetic field exposure; however, many of these studies could not be replicated by other researchers (id. at 1077-1078).

Dr. Valberg also provided an update on research published since the NRC Report (id. at 1078 to 1090). He discussed a recent study, conducted by the National Cancer Institute

("NCI"), which found no correlation between exposure to present-day measured fields of over two mG and leukemia (id. at 1083). He noted that the researchers later regrouped the study data and found statistically significant correlations for some groups with higher levels of exposure, but could not conclude that there was a consistent pattern that would support a dose response effect (id. at 1083-1085). Dr. Valberg also noted that two recent animal studies found little or no elevation of cancer rates from exposure to magnetic fields (id. at 1088 to 1089).

In addition, the Company provided a copy of a recent Canadian study, where field exposure was assessed through monitors in children's backpacks, which finds "little support for the hypothesis of an increased risk of childhood leukemia either from magnetic or electric fields or from residential power line configurations" (Exh. HO-RR-11(att.)). The Company also provided summaries of three other recent publications resulting from two studies dealing with the risk of childhood cancer resulting from EMF exposure (Exh. HO-RR-21). The first two publications, taken together, find that residential proximity was not associated with increased risk of childhood leukemia, while exposures to electric fields as measured through monitoring devices attached to the child were associated with a decreased leukemia risk (Exh. HO-RR-21, at 2-3). The third publication, which focused on maternal exposure to EMF during pregnancy, found no evidence that such exposure is a risk factor for childhood leukemia, childhood brain cancer, or childhood cancer generally (id. at 3).

Tofias Trust argues that the Company has not provided all EMF studies published since the NRC Report, and states that, had it been permitted to intervene, it would have presented a contrary review of the scientific literature (Tofias Initial Brief at 10-11).

In this and several other recent cases, the Siting Board has reviewed the scientific literature with respect to the effect of power line frequency EMF on human health. Sithe Mystic Decision, EFSB 98-8 at 86-89; IDC Bellingham Decision, EFSB 97-5, at 118-119; Sithe Edgar Decision, EFSB 98-7, at 126-128. Overall, although there are some epidemiological studies which suggest a correlation between exposure to magnetic fields and childhood leukemia, and some evidence of biological response to exposure to magnetic fields in animal studies, there is no evidence of a cause-and-effect association between magnetic field exposure and human health. Thus, the record in this case does not support a conclusion that the EMF levels anticipated as a result of the proposed project would pose a public health concern.

Tofias Trust has argued that the record in this case may be incomplete, and that additional studies may be available which would support the hypothesis of a link between power-frequency electric field exposure and human health. The Siting Board agrees that such studies may be available, and that we cannot conclusively reject such a hypothesis, particularly with respect to childhood leukemia. Because of the scientific uncertainty surrounding this issue, the Siting Board's policy is to encourage transmission providers to take cost-effective steps to minimize magnetic fields. Consistent with this policy, the Company has agreed to route its interconnect line in a manner that would minimize residential exposure to EMF. In addition, in order to ensure that the EMF levels are as

projected in this record, the Siting Board has required the Company to inform it of any significant change in the Company's proposed interconnect line, and to provide it with an update on the extent and design of required upgrades to existing transmission lines. Accordingly, the Siting Board finds that the health effects, if any, of magnetic fields associated with the proposed project would be minimized.

7. Noise

As discussed in Section III. G above, the proposed facility would produce noise that would be noticeable in some surrounding community areas, both during the facility construction period and during operation of the facility. The Company has assessed the noise impacts of the proposed facility in relation to applicable federal and local criteria for acceptable ambient noise, as well as the MDEP standard which limits allowable noise increases from new sources.

The Company provided information indicating that OSHA and EPA both have established guidelines to prevent hearing loss due to long-term exposure to noise; the OSHA guidelines (29 CFR § 1910.95) prohibit an 8-hour workday exposures exceeding average of 90 dBA, while the EPA guidelines recommend that noise exposure not exceed an average of 75 dBA (L_{eq}) over 8 hours, or 70 dBA (L_{eq}) over 24 hours (Exhs. BP-1, at 4.11-4; EFSB-N-3, at 4). In addition, the EPA guidelines suggests that an outdoor L_{dn} of 55 dBA likely would result in indoor nighttime noise levels of approximately 32 dBA, which should, in most cases, protect against sleep interference (id.).

The record shows that, with the proposed facility in operation, outdoor L_{dn} noise levels could increase by 1 dBA at the Crown Place Condominiums to 61 dBA and increase by 1 dBA to 57 dBA for residences on Appleby Street. The outdoor L_{dn} noise at all other residential receptors was predicted to remain unchanged. Although these levels are clearly above the 55 dBA(L_{dn}) level recommended by the EPA, the Siting Board notes that the predicted 1 dBA increases at the nearest receptors are not likely to be noticed in a normal community. Furthermore, the resulting noise levels are well below thresholds where hearing loss from long-term noise exposure could occur. Consequently, the Siting Board finds that the health effects, if any, of noise from the proposed project would be minimized.

8. Conclusions

In the sections above, the Siting Board has reviewed the proposed project's potential for effects on human health resulting from emissions of criteria pollutants, emissions of air toxics, emissions of waste water impurities, emissions to ground and surface waters,

handling and disposal of hazardous materials, electric and magnetic frequencies, and noise. The Siting Board has found that: (1) the cumulative health impacts of criteria pollutant emissions from the proposed facility would be minimized; (2) the air toxics emissions from the proposed project would have no discernable public health impact; (3) the use of treated effluent in the cooling towers would not lead to health risks associated with airborne impurities; (4) the proposed project poses no health risks related to the contamination of potable groundwater or the disposal of wastewater; (5) the health risks of the proposed project related to the handling and disposal of hazardous materials would be minimized; (6) the health effects, if any, of magnetic fields associated with the proposed project would be minimized; and (7) the health effects, if any, of noise from the proposed project would be minimized.

The Siting Board notes that the only indication of potential pre-existing public health problems in the communities surrounding the proposed project is the existence of statistically elevated levels of a variety of cancers. However, there is no evidence in the record suggesting that the levels of pollutants emitted by the proposed facility would in any way increase these types of cancer. Moreover, the record shows that the proposed project emits air toxics, including carcinogens, at levels below TELs and AALs, and that, where adequate information is available, AALs for carcinogens are set to correspond to an incremental lifetime risk of developing cancer of one in one million. Consequently, the Siting Board finds that there is no evidence that the proposed project would exacerbate existing public health problems in the communities surrounding the proposed project.

Accordingly, based on its review of the record, the Siting Board finds that the cumulative health impacts of the proposed project would be minimized.

M. Conclusions

Based on the information in Sections III. B through III. L, above, the Siting Board finds that the Company's description of the proposed generating facility and its environmental impacts is substantially accurate and complete.

In Section III. B, the Siting Board has found that, with the implementation of CO_2 mitigation, the environmental impacts of the proposed facility would be minimized with respect to air quality.

In Section III. C, the Siting Board has found that, with implementation of a condition requiring ground water protection measures such as impermeable bases for bulk chemical storage systems, the environmental impacts of the proposed facility would be minimized with respect to water resources.

In Section III. D, the Siting Board has found that the environmental impacts of the proposed facility would be minimized with respect to wetlands.

In Section III. E, the Siting Board has found that, with implementation of a condition requiring the recycling of construction waste as appropriate, the environmental impacts at the proposed facility would be minimized with respect to solid and hazardous waste.

In Section III. F, the Siting Board has found that, with the implementation of a condition requiring off-site mitigation of visual impacts, the environmental impacts of the proposed facility would be minimized with respect to visual impacts.

In Section III. G, the Siting Board has found that the environmental impacts of the proposed facility would be minimized with respect to noise.

In Section III. H, the Siting Board has found that, with the implementation of conditions requiring facility security measures, the completion of its SPCC and ERP plans in consultation with the City of Brockton and the Town of West Bridgewater, and the development of an icing-hazard mitigation plan, the environmental impacts of the proposed facility would be minimized with respect to safety.

In Section III. I, the Siting Board has found that, with the implementation of conditions requiring the Company to identify and if possible implement an alternative exit route for commercial traffic leaving the facility and to contact the City of Brockton and other nearby property owners or occupants to evaluate the possibility of improving traffic conditions at the Route 28-Sargents Way intersections, the environmental impacts of the proposed facility would be minimized with respect to traffic.

In Section III. J, the Siting Board has found that, with the pursuit of cost-effective designs for decreasing magnetic fields along affected transmission lines that require upgrades, the environmental impacts of the proposed facility would be minimized with respect to EMF.

In Section III. K, the Siting Board has found that the environmental impacts of the proposed facility would be minimized with respect to land use.

In Section III. L, the Siting Board has found that the cumulative health impacts of the proposed facility would be minimized.

Accordingly, the Siting Board finds that, with the implementation of the above-listed conditions relative to air quality, water resources, solid waste, visual, safety, and traffic impacts, 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 proposed generating facility.

IV. CONSISTENCY WITH THE POLICIES OF THE COMMONWEALTH

A. Standard of Review

G.L. c. 164, §69 J¼ 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; however, they may include existing regulatory programs of the Commonwealth relating to issues such as air quality, water-related discharges, noise, water supply, wetlands or river front protection, rare and endangered species, and historical or agricultural land preservation. Therefore, in this Section, the Siting Board summarizes the health and environmental protection policies of the Commonwealth that are applicable to the proposed project and discusses the extent to which the proposed project complies with these policies.[(90)]

B. Analysis

In Sections II and III, above, the Siting Board has reviewed the process by which Brockton Power sited and designed the proposed project, and the environmental and health impacts of the proposed project 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 project. These are briefly summarized below.

As discussed in Section III.B, above, the MDEP extensively regulates emissions of criteria and non-criteria pollutants from new sources such as the proposed project. Brockton Power has demonstrated that it expects to comply with all MDEP standards.[(91)]

As discussed in Section III.C, above, Brockton Power has demonstrated that it will comply with state and local requirements related to wastewater treatment and stormwater.

As discussed in Section III.D, above, Brockton Power has demonstrated that the wetlands impacts of the proposed project would be minimized. In addition, Brockton Power has received an Order of Conditions for the proposed project from the Brockton Conservation Commission, as required by the Massachusetts Wetlands Protection Act.

As discussed in Section III.G, above, Brockton Power has demonstrated that it will limit L_{90} noise increases at the nearest residence to 5 dBA, consistent with MDEP Policy 90-001. The proposed facility likely will require a waiver from MDEP for its property line noise increases, which exceed the 10 dBA limit set in MDEP Policy 90-001.

As discussed in Section III.K, above, Brockton Power has demonstrated that it has complied with state programs protecting historical and archeological resource areas and rare or endangered species.

Consequently, based on its review above, the Siting Board finds that plans for construction of the proposed project 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.

V. 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 69 J¼ 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 facility, and the consistency of the plans for construction and operation of the proposed facility with the environmental policies of the Commonwealth.

In Section II, above, the Siting Board has found that the Company's description of the site selection process it used is accurate, and resulted in the selection of a site that contributes to the minimization of environmental impacts of the proposed project and the costs of mitigating, controlling, and reducing such impacts.

In Section III, above, the Siting Board has found that with implementation of listed conditions relative to air quality, water resources, solid waste, visual impacts, safety, traffic and EMF impacts, 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 proposed facility.

In Section IV, above, the Siting Board has found that the plans for the 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 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 in Sections III. B., III. C., III. E., III. F., III. H., III. I., III. J., above, and listed below, the construction and operation of the proposed 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 Brockton Power LLC to construct a 270 MW gas-fired combined cycle electric generating facility in the City of Brockton, Massachusetts. The Company shall comply with the following conditions during construction and operation of the proposed generating facility:

- In order to minimize air quality impacts, the Siting Board directs the Company to make a monetary contribution to cost effective CO_2 mitigation programs of an amount that reflects the proposed facility's annual CO_2 emissions of 952,209 tpy over 20 years of operation.

- In order to minimize water resources impacts, the Siting Board directs the Company to incorporate ground water protection measures such as impermeable bases into the design of bulk chemical storage containment systems to the containment system.

- To minimize solid waste impacts, the Siting Board directs the Company to develop and implement a plan for segregating and recycling wood, metal, and other recyclable debris during the construction phase of the proposed project. In the event that the Company determines that recycling of selected construction debris is impractical or burdensome, the Siting Board directs the Company to submit a detailed evaluation of the factors that contributed to the determination, including an analysis of the waste stream, an analysis of costs associated with disposal and recycling, and a comparison of recycling costs to potential environmental benefits of recycling at the proposed facility.

- In order to minimize visual impacts, the Siting Board directs the Company to provide reasonable off-site mitigation of visual impacts at affected residential properties and at roadways and other locations within one mile of the proposed facility, as requested by individual property owners or appropriate municipal officials. For this decision, reasonable offsite mitigation could include shrubs, trees, or other mutually-agreeable measures, such as window awnings, that would screen views of the proposed generating facility and including the proposed electrical interconnection line.

- In order to minimize safety impacts, the Siting Board directs the Company to provide for facility security and to limit access to the proposed site during

construction and operation of the proposed facility.

- In order to minimize safety impacts, the Siting Board directs the Company to prepare the SPCC plan and the ERP in consultation with both the City of Brockton and the Town of West Bridgewater.

- In order to minimize safety impacts, the Siting Board directs the Company to develop and implement a plan for mitigating hazardous roadway and walkway conditions that could result from icing associated with the cooling towers.

- In order to minimize traffic impacts, until such time as the Route 28-Sargents Way intersection is improved, the Siting Board directs the Company to limit oil deliveries and other commercial delivery traffic to off-peak hours except where emergency conditions exist.

- In order to minimize traffic impacts, the Siting Board directs the Company to work with the City of Brockton Department of Public Works and with the management of other commercial or industrial facilities within the Oak Hill Industrial Park to identify and if appropriate promote implementation of plans to improve the Route 28-Sargents Way intersection.

- In order to minimize EMF impacts, the Siting Board directs the Company to provide the Siting Board with an update on: (1) the extent and design of required transmission upgrades; (2) the measures incorporated into the transmission upgrade designs to minimize magnetic field impacts; and (3) the resulting magnetic field levels at the edge of the EUA ROW based upon the transmission upgrade design and most likely load flow scenario.

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

In addition, the Siting Board notes that the findings in this decision are based upon the record in this case. A project proponent has an absolute obligation to construct and operate its facility in conformance with all aspects of its proposal as presented to the

Siting Board. Therefore, the Siting Board requires the Company to notify the Siting Board of any changes other than minor variations to the proposal so that the Siting Board may decide whether to inquire further into a particular issue. The Company is obligated to provide the Siting Board with sufficient information on changes to the proposed project to enable the Siting Board to make these determinations.

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Peter M. Palica

Hearing Officer

Dated this 13th day of March, 2000

1. Initially, the Company proposed an electrical interconnection route that would run east through a vacant lot and the Ryder Bus Depot and then south within the MBTA right-of-way to the EUA transmission lines (Exh. BP-1, at 1-24). The current proposed route would avoid a portion of the MBTA right-of-way which is adjacent to a residential neighborhood (Exh. EFSB-EL-11; Tr. 1, at 126).

2. The primary principals of Brockton Power include Mr. Dennis Barry and Mr. Leo Barry of the Hallamore Corporation construction company, which has provided development-related services for power plants in Massachusetts and Connecticut (Exhs. EFSB-B-1; BP-1, at 1-43). Another primary principal in the Company is Mr. George Baldwin, President of Corporate Realty Associates, which specializes in large development projects (id.). Other participants include Mr. Michael McSharrey as well as Mr. Kevin O'Reilly, who has participated in the development of generating facilities in New York, Connecticut, and Massachusetts (id.).

3. [3] Prior to September 1, 1992, the Siting Board's functions were effected by the Energy Facilities Siting Council ("Siting Council"). See St. 1992, c. 141. As the Siting Council was the predecessor agency to the Siting Board, the term Siting Board should be read in this Decision, where appropriate, as synonymous with the term Siting Council.

4. Arnold B. Tofias Trust, Trustee of the Julius Tofias Realty Trust ("Tofias Trust") argues that, because Brockton Power has modified the proposed route for its electrical interconnection from that specified in the notice of adjudication, and because the Siting Board cannot approve a site, route, or portion of a route that has not been noticed, the Siting Board must re-notice the electrical interconnect route before approving it (Tofias Trust Brief at 19-20). The Siting Board agrees that it would not approve a transmission line over which it has jurisdiction along a route that had not previously been noticed; it could, however, accept without re-notice route variations or changes in alignment that did not change the affected abutters or landowners.

Here, the facility under review by the Siting Board is Brockton Power's proposed generating facility; the interconnect line is only an ancillary part of the proposal, and is not independently subject to Siting Board jurisdiction so that it would require notice and approval. G.L. c. 164, § 69H. We note that the routes of electrical, natural gas, and water interconnections for generating facilities, whether or not subject to our jurisdiction, are of interest to the Siting Board because they have bearing on the overall environmental impacts of the project. In order to fulfill its mandate to minimize the environmental impacts of a facility, the Siting Board must be able to recommend or require changes to the initial facility proposal, including the relocation of interconnections. Such project refinements or improvements arising in the course of Siting Board proceedings generally do not require additional notice under the relevant statutory provisions or Siting Board precedent. See G.L. c. 164 § 69J¼; ANP Blackstone Energy Company, EFSB 97-2/98-2, at 175 (1999) ("ANP Blackstone Decision"). To require re-notice when such changes take place would either create significant unnecessary delay in Siting Board proceedings, or, worse, serve as a deterrent to good faith identification and implementation of changes that would improve the overall quality of the project.

The Siting Board also notes that Tofias Trust did have actual notice of the proposed relocation of the transmission interconnection in its capacity as an interested party and in fact filed a renewed motion to intervene in this proceeding on that basis; accordingly, its allegations about lack of notice are without merit.

5. Subsequently, Tofias Trust filed a motion for reconsideration and a motion for a renewed petition for intervention. The Hearing Officer denied the motions on April 22, 1999 and September 8, 1999, respectively. Brockton Power, LLC, EFSB 99-1, Hearing Officer Procedural Ruling, September 8, 1999, at 8.

6. The Siting Board notes that, although Tofias Trust's corrections to its brief and reply brief were dated August 2, 1999 and August 4, 1999, respectively, those documents were

misfiled by Tofias Trust at the Siting Board's vacated offices at 100 Cambridge Street, Boston, MA and, consequently not received by the Siting Board until August 5, 1999 and

August 6, 1999, respectively.

7. G.L. c. 164, § 69 J¼ includes "radiation impacts" in the list of generating facility impacts to be reviewed by the Siting Board. The Siting Board understands the term "radiation" to include the nuclear radiation which is a property of nuclear power plants; consequently, such impacts are not considered in the Siting Board's review of gas-fired generating facilities.

8. The broad mandate of the Siting Board is to provide a reliable supply of energy for the Commonwealth with a minimum impact on the environment at the lowest possible cost. G.L. c. 164, §69 H.

9. The Siting Board notes that parties and interested persons in generating facility cases pending before the Siting Board at the time of the issuance of the Request for Comments either have been or will be afforded an opportunity to comment on the standards of review applicable under the statutory mandate.

10. The Siting Board also reviews in this decision the environmental impacts of the proposed project, including EMF, traffic and safety.

11. As set forth in Section III.B, below, the Siting Board finds that the expected emissions from the proposed generating facility do not exceed the technology performance standard specified in 980 CMR 12.00. Therefore, a generating technology comparison is not required in this case.

12. The New Bedford site is a 15-20 acre parcel owned by the Polaroid Company in the north end of the city (Tr. 1, at 44; Exh. BP-1, at 2-7). Brockton Power indicated that approximately three miles of pipeline upgrade would be necessary for this site (Tr. 1, at 44). The Taunton site is 25 acres owned by Taunton Municipal Lighting Plant and is located near Somerset Avenue in South Taunton (id.). The Company indicated that, for this site, one and one half miles of gas pipeline would have to be upgraded and a pipeline crossing of the Taunton River would be necessary (id.). The Plymouth site is a 15 acre parcel on Nick's Rock Road in the Plymouth Industrial Park (id.). The Company indicated that the gas pipeline serving the town of Plymouth was not sufficient for a generating facility and that upgrades would be prohibitively expensive (Tr-1, at 33-34).

13. Brockton Site 3 is 13.2 acres in size with only minor wetlands at the southern and western margins of the site (Exh. BP-1, at 1-1). The site is adjacent to the AWRF, has existing roadway access on Industrial Avenue, and is 1500 feet from an existing gas pipeline (Tr. 1, at 11, 30). The nearest residential properties are 1100 feet away (Exh. BP-1, at 1-13). All three of the Brockton sites are appropriately zoned for the proposed project (I-3, Heavy Industry) and the Company has established that there is widespread community support for the project in Brockton (Exh. BP-1, at 1-1 (Tables 1-1, 1-2, 1-3,

1-4)). Although the 30 acre Brockton Site 1 is larger than Site 3 and is closer to electric interconnections, Brockton Power indicated that it has outweighing disadvantages including longer gas pipeline and water supply interconnections, a higher proportion of wetlands, closer proximity to residential properties, and location of the site within two municipalities (Tr. 1, at 21-33). Furthermore, the Company indicated that the landowner of Site 1 was reluctant to negotiate a purchase agreement, so the property was unavailable for development (Exhs. BP-1, at 2-7; EFSB-S-5, at 2). The Company indicated that 9.5 acre Brockton Site 2 is comparable to Site 3 in distance to sensitive receptors, proximity to a suitable water supply, and proximity to gas and electric transmission, but the site was deemed unsuitable because extensive wetlands limited the potential area for development (id.).

14. The Company conceded that the numerical ranking of the Brockton sites was not the method ultimately used to compare potential facility locations; however, it argued that the ranking provides strong support for the selection of Brockton Site 3 for the proposed project (Exh. HO-RR-1).

15. The Siting Board notes that, in addition to establishing criteria to minimize the costs and environmental impacts of potential facility sites, Brockton Power included community acceptance as a specific siting criteria. Furthermore, the Company described efforts to gauge and monitor community acceptance for the project at the selected site. The Siting Board encourages such early outreach and careful consideration of local opinion when evaluating locations for an energy facility.

16. Massachusetts has adopted the NAAQS as the Massachusetts Ambient Air Quality Standards (Exh. BP-1, at 4.6-2 to 4.6-3). Pollutant concentration limits established as "primary" NAAQS and MAAQS standards are intended to protect human health while the "secondary" standards are intended to protect against any known or anticipated adverse effects that could impact the public welfare, such as damage to vegetation (id.).

17. As part of the PSD review, the MDEP applies acceptable ambient limits for over 100 air toxic pollutants (Exh. HO-RR-4(att.)). The Company indicated that a facility subject to PSD review is evaluated by the MDEP for compliance with Threshold Effect Exposure Limits ("TELs") and average annual Allowable Ambient Limits ("AAL") (id.).

18. The Company stated that the EPA promulgated a new Fine Particulate (PM-2.5) NAAQS in 1997, but that EPA indicated the PM-10 standard should continue to be used while a PM-2.5 monitoring network is being established (BP-1, at 4.6-3).

19. The Company submitted a list of PSD pollutants which included the criteria pollutants, particulate matter, beryllium, mercury, and several pollutants that, the Company indicates, would not be expected in emissions from the proposed project (Exh. EFSB-E-1, at 3.1-2 (Table 3.1-1)).

20. Brockton Power stated that emissions from the proposed facility were modeled for operating conditions of 100 percent base load at 50 degrees Fahrenheit (Exh. BP-1, at 3-

4). The Company indicated that it used the ABB GT-24 reference guide, supplemented with other vendor information, to determine emissions for the criteria pollutants and that it combined this information with the calculated output of the facility for the specified load and temperature conditions in order to determine emission rates in lbs/MW-hr (id.). The Company calculated emissions rates for non-criteria pollutants using EPA's Compilation of Air Pollution Emission Factors, 5th Edition, AP-42 Section 3-1 Draft Table 3.1-4 (id.).

21. The Company indicated that its analysis of air quality impacts was conducted in accordance with EPA and MDEP procedures (Exh. BP-2, at 5.7-19).

22. The Company indicated that the EPA's revised Guidelines for Determination of Good Engineering Practice Stack Height (EPA 1985) present a stack height formula of $H_{GEP} = H_b + 1.5L$, where H_{GEP} is stack height, H_b is height of adjacent or nearby structures and L is either the height or width of the nearby or adjacent building, whichever is less (Exh. BP-1, at 4.6-12). The Company indicated that the Good Engineering Practice ("GEP") stack height for the proposed project would be 200 feet; however, the Company proposed a sub-GEP stack height of 185 feet to address visual impact concerns of the local community and stated that either stack heights would result in minimal air quality impacts (Exhs. BP-1, at 4.6-13; HO-RR-19; Tr. 2, at 348-349).

23. The Company argued that its air modeling is conservative because the emissions calculations reflect emissions associated with the cooling tower in addition to turbine exhaust emissions (Exh. EFSB-E-1 (Table 3.1-1)). The Company also indicated that its air quality modeling is conservative because it used worst case part load scenarios, even though it intends to operate the proposed facility as a base load facility (i.e., 100 percent load except for maintenance) (Exh. BP-1, at 4.6-22).

24. Brockton Power explained that use of oil as a backup fuel is being proposed for this facility to preserve fuel diversity in the event of potential gas supply problems (Tr. 1, at 68 - 69). The Company indicated that the MDEP was in favor of the proposed facility having oil backup because of concerns about the number of proposed generating facilities in the region without an alternative to gas firing (id.). The Company specified that fuel oil would be used only during periods of gas supply interruption and would not be used from May 1 to September 30 (ozone season), except in the case of a gas supply emergency (Exh. EFSB-E-1, at 3.1-5; Tr. 1, at 67 - 68).

25. The Company indicated that BACT is based on the maximum degree of reduction of any regulated air contaminant which is achievable taking into account energy, environmental, and economic impacts (Exh. BP-1, at 4.6-5). The Company indicated that the MDEP determines BACT on a case-by-case basis (id.).

26. The Company stated that EPA defines LAER as "the most stringent emission limitation contained in the implementation plan for any state for such class or category of source, or the most stringent emissions limitation achieved in practice by such a class or category of source" (Exh. BP-1, at 4.6-6).

27. SCR technology for controlling NO_X emissions uses a catalyst to facilitate a reaction of injected aqueous ammonia with NO_X to produce water and nitrogen (Exh. BP-1, at 4.6-7). The Company indicated that the control technology proposed for the project would have an ammonia slip rate of 2 parts per million ("ppm") (Exh. HO-RR-4 (Table 8.3-1)).

28. With regard to the use of SCR or a zero ammonia technology to achieve BACT, the Siting Board is of the opinion that, due to its primacy of jurisdiction and to its greater expertise in emissions control technologies, MDEP is the agency best suited to determine whether and when to introduce new emissions control technologies into the Commonwealth. See IDC Bellingham Decision, EFSB 97-5, at 35). As a result, the Siting Board will not require use of such technology (Id.). The Siting Board also notes that MDEP in a recent gas facility permit effectively has allowed the use of SCR rather than a zero ammonia technology at this time, with a review of the cost-effectiveness of retrofitting a zero ammonia technology to be conducted within five years. ANP Bellingham Eneergy Company Decision on Compliance, EFSB 97-1, at 6 (1999). The Siting Board therefore concludes that by incorporating the control technology that MDEP determines to be LAER for NO_x, the Company will have minimized its NO_X emissions and ammonia slip consistent with minimizing the cost of mitigating and controlling such technologies.

29. The Siting Board notes that in previous reviews of projects that use sanitary wastewater it found that operation of wet mechanical cooling towers would have acceptable air quality impacts and no other adverse impacts. Altresco Lynn, Inc., 2 DOMSB 1, at 191; Enron Power Enterprise Corporation, 23 DOMSC 1, at 199 (1991) ("Enron Decision"); West Lynn Cogeneration, 22 DOMSC 1, at 96 (1991).

30. Previously the Siting Board required project proponents to commit to a specific program of CO_2 mitigation, such as tree planting or a forestation program designed to offset a percentage of facility CO_2 emissions within the early years of operation. See Berkshire Power Development, Inc., 4 DOMSB 221, 373-374 (1996)("Berkshire Power Decision").

31. The contribution is based on offsetting one percent of facility CO_2 emissions over 20 years, at $1.50 per ton. To calculate the required offset payment, the 20-year amount of $285,663 is first distributed as a series of payments to be made over the first five years of project operation, then adjusted to include an annual cost increase of three percent. Annual contribution amounts would be distributed as follows: year one $57,132; year two $58,846; year three $60,611; year four $62,430; year five $64,303. See ANP-Blackstone Decision, EFSB 97-2/98-2, at 114; Cabot Power Corporation, EFSB 91-101A (1998)("Cabot Power Decision"); ANP Bellingham Decision, EFSB 97-1, at 104; U.S. Generating Company, EFSB 96-4, at 114, 117-118 (1997)("Millennium Power Decision").

32. This figure is calculated by discounting, at ten percent annually, the five annual payments totaling $303,322. See ANP Blackstone Decision, EFSB 97-2/98-2, at 114; Cabot Power Decision, EFSB 91-101A, at 57-58; ANP Bellingham Decision, EFSB 97-1,

at 104; Millennium Power Decision, EFSB 96-4, at 114 117-118. The single up-front payment of $246,888 would be due by the end of the first year of operation.

33. Brockton Power indicated that under normal circumstances, water from the Brockton AWRF would be diverted from the treatment plant discharge subsequent to tertiary treatment and sand filtration (Exh. EFSB-E-1, at 2-3). Under high flow conditions, the Company indicated that water would probably be obtained immediately downstream of the secondary system (id.). The Company estimated that during at least 90 percent of facility operation, water would be diverted after tertiary treatment (Tr. 2, at 323-324).

34. In its evaluation of its potential effects of the proposed facility on water resources, the Company cited the following references: (1) Gazetteer of Hydrologic Characteristics of the Streams in Massachusetts - Taunton and Ten Mile River Basins and Coastal River Basins of Mount Hope Bay Narragansett Bay and Rhode Island Sound; (2) 1997 City of Brockton Taunton River Water Supply Environmental Impact Report; (3) 1991 Draft Taunton River Basin Plan; and (4) 1993 Strategy for Meeting the Water Supply Needs of Brockton and Other Taunton River Basin Communities Through the Year 2020.

35. Because there is no record of flow rates in the Salisbury Plain River, the Company estimated mean annual flow rates by analyzing measured flow rates from six USGS gauging station in the Taunton River basin that have at least ten years of data, including three gauging station that are operating currently (Exh. BP-1 at 4.4-7 to 4.4-10). By plotting the mean annual flows, minimum mean annual flows, and maximum mean annual flows versus the drainage areas and regressing a line through each set of data, the Company determined a constant for calculating river flow based on drainage area (id.). The Company indicated that a similar method was used to estimate instantaneous peak flood and minimum mean monthly flow of the river (id.).

36. The 7Q2 and 7Q10 low flow rates are the minimum rates of average flow over seven consecutive days that are expected to recur on average once every two years and once every ten years, respectively.

37. The 1991 Draft Taunton River Basin Plan was prepared by MDEP for the Massachusetts Water Resources Authority (Exhs. BP-1, at 4.4-14; EFSB-EU-2). This document recommends a minimum threshold flow rate of 0.22 cubic feet per second per square mile ("cfsm") for the Taunton River basin as a whole (id.). The Basin Plan also indicates that due to local hydrogeologic factors, 10 subbasins within the Taunton River basin, including the Matfield River basin (which includes the Salisbury Plain River) should have a minimum flow threshold of 0.15 cfsm (id.). Given the 16.7 square mile area of the drainage basin at the AWRF and the 0.15 cfsm threshold, the minimum flow at the AWRF should be 2.5 cfs.

38. The 1997 City of Brockton Taunton River Water Supply Supplemental Draft Environmental Impact Report indicated that at the Mill Street Bridge the river depth is 4.09 feet when the flow rate is 28 cfs (7Q2 low flow) but when the flow rate is decreased to 13 cfs (7Q10 low flow) the river depth is 3.97 feet (Exh. EFSB-3 (Tables J-4, J-5)).

This corresponds to a 0.12 foot decrease in stream depth for a 53 percent change in flow rate.

39. Because Brockton Power has indicated that oil firing will not occur between May 1 and September 30, water injection is unlikely to occur during periods of either low flow from the AWRF or high cooling and process water use.

40. Comparable usage rates for other facilities using wet mechanical cooling are 5740 gpd per MW for the 252 MW Berkshire Power facility, 6986 gpd per MW for the 146 MW Enron facility, and 8,333 gpd per MW for the 240 MW Masspower facility. See Berkshire Power Decision, 4 DOMSB 221, at 374 (1996); Enron Decision, 23 DOMSC at 134 (1991); Masspower, Inc., 20 DOMSC 301, at 301 (1990).

41. In response to a Draft Environmental Impact Report ("DEIR") comment letter, Brockton Power indicated that another generating facility that may be proposed for a site adjacent to the Brockton Power site is proposing to use 1.1 mgd of treated effluent from the Brockton AWRF (Exh. EFSB-E-1, at B-9 to B-10). The Company indicated that even this additional use would not result in the Salisbury Plain River having flow thresholds, even during low flow periods, below any of the suggested thresholds cited in Section II.B.2 above (id.).

42. The Company indicated that the land under the Salisbury Plain River at the western boundary of the site constitutes LUW and that the eastern bank of the river qualifies as regulated Bank (Exh. BP-1, at 4.5-4 to 4.5-13). The Company has also indicated that because the proposed facility is within an urban area (City of Brockton), the Riverfront Area extends for only 25 feet from the river rather than the 200 feet designated for many areas (id.). The BLSF was determined by Brockton Power using the flood elevation of the Salisbury Plain River associated with the 100-year frequency storm (72.5 feet, NGVD) as indicated on the Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map for the area (Community-Panel Numbers 250261-0005 C) (id.). At the northwest boundary of the site, along the Salisbury Plain River, the Company identified BVW in a narrow strip (25 feet) which is contiguous with a more extensive area (approximately 1.4 acres) in the southwest corner of the site (Exhs. BP-1, at 4.5-4 to 4.5-13; BP-2 (fig. 5.9-1)). Finally, the Company identified approximately 0.2 acres of isolated wetland near the center of the southern site boundary (id.).

43. The Company provided a copy of the Brockton Conservation Commission's Order of Conditions for the proposed project (Exh. EFSB-E-3(f)).

44. The MDEP and EPA guidelines cited by the Company are: (1) MDEP, 1993, Massachusetts Nonpoint Source Management Manual: A Guidance Document for Municipal Officials and (2) EPA, 1992, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices (Exh. BP-1, at 4.5-15 to 4.5-16).

45. In the project interconnect study, provided after the close of hearings, Eastern Utilities Associates ("EUA") recommends that Brockton Power install two new interconnect lines on double circuit poles along the proposed route, rather than a single interconnect line as proposed by Brockton Power in this review (Exh. HO-RR-7S (att. at 3, 10-12, 15). If there is a significant change in the Company's proposed interconnect line, including the possible change of using a double-circuit interconnect line configuration as recommended in EUA's interconnect study, Brockton Power must inform the Siting Board of such change in order that the Siting Board may determine whether to inquire further into the matter (see Section III.J, below).

46. See IDC Bellingham Decision, EFSB 97-5, at 56; Sithe Edgar Decision, EFSB 98-7, at 58; Sithe Mystic Decision, EFSB 98-8, at 39.

47. In the Sithe Edgar Decision (EFSB 98-7, at 58-59) the Siting Board concluded that further review of measures to minimize solid waste impacts for gas and oil fired facilities is now warranted. The Siting Board stated that future applicants for proposed generating facilities would be required to demonstrate that they would minimize solid waste impacts by characterizing the waste stream from the proposed facility, describing solid waste minimization and recycling strategies proposed for the facility, and, as applicable, providing a comparison with statewide policy initiatives and/or governmental or industry guidelines or averages.

48. The Company indicated that the viewsheds shown in the analysis were primarily taken from roadways to provide an adequate clearing to see the projected location of the facility and to provide a representative analysis of public viewing (Exh. BP-1, at 4.10-1 to

4.10-2). The Company indicated that initial viewshed analysis for locations 1-7 were performed during foliate conditions, but stated that the potential visual impacts under defoliate conditions were considered (id.). The Company concluded that, during defoliate conditions, only Viewshed #5 would be substantially affected but that the visual impact would still be minimal (id.). The Company indicated that viewshed analyses at location A, B, and C were performed during defoliate conditions (Exh. EFSB-V-1).

49. The Company indicated that it was unable to obtain a representative viewshed photograph due to a lack of public access (Exh. BP-1, at 4.10-6).

50. The Company provided information indicating that the corner pole would include two sets of insulators and require a larger foundation than the in-line poles (Exh. EFSB-V-4).

51. In the project interconnect study, provided after the close of hearings, EUA recommends that Brockton Power install two new interconnect lines on double circuit poles along the proposed route, rather than a single interconnect line as proposed by Brockton Power in this review (Exh. HO-RR-7S (att. at 3, 10-12, 15)). If there is a significant change in the Company's proposed interconnect line, including the possible change of using a double-circuit interconnect line configuration as recommended in

EUA's interconnect study, Brockton Power must inform the Siting Board of such change in order that the Siting Board may determine whether to inquire further into the matter (see Section III.J, below).

52. The designation "dBA" indicates sound measured in decibels using an "A-weighting" network, which emphasizes the middle range of sound frequencies that are within the human hearing range and de-emphasizes lower and higher frequencies (Exh. BP-1, at 4.11-1 to 4.11-3). Noise levels reported as "L_{dn}" are A-weighted sound levels averaged over a 24 hour period but with a 10 dBA penalty added to noise during nighttime hours. Noise levels reported as "L_{eq}" are sound levels averaged over a specified period of time (Exh. EFSB-N-3 (att.) at 3). The term "L_{90}" refers to an exceedence level, which is the sound level exceeded 90 percent of the time during a measurement interval (Exh. BP-1, at 4.11-3). Unless otherwise indicated, noise levels described in this section will be reported in dBA at L_{90}.

53. Pure tone conditions are defined as any sound where an octave band level exceeds adjacent octave bands by 3 dB or more (Exh. BP-1, at 4.11-4; 4.11-22).

54. Brockton Power indicated that the noise level survey was performed during the summer of 1998 during daytime and nighttime periods of both weekdays and weekends (Exh. HO-RR-4 (att.) at 7-4 to7-11). The Company specified that sound level measurements were taken between midnight and 5:00 a.m. for nighttime measurements and during off-peak traffic periods for daytime measurements (id.). Conditions during the measuring intervals were described by the Company as periods with dry roadways and low wind conditions (id.). The Company stated that the measurements were for twenty minute intervals and were made using a calibrated Rion NA-29 sound level meter (id.).

55. The EPA published a document entitled "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (1974) (Exh. EFSB-N-3, (att.)). This document identifies maximum sound levels, that are requisite to protect public health and welfare from hearing loss (70 dBA, $L_{eq(24)}$), interference with outdoor activity (55 dBA, L_{dn}), and interference with indoor activity (45 dBA, L_{dn}) (id., at 2-3).

56. The Company's analysis shows that model locations R-4 and R-5 are closer than ambient measurement points used in the modeling and that model points PL-1, PL-2, and C-2 use a single ambient measure from a monitoring point (SML-5) which does not correspond to any model point location (Exh. HO-RR-4 (att. at 7-19 to 7-24)).

57. The Company cited concrete pours as a circumstance that could require work hours beyond 3:00 p.m. (Exh. Tr. Volume 2, at 184-185).

58. The Siting Board notes that the noise increases at the property boundaries would be greater than the 10 dBA increase allowed by the MDEP. In past Siting Board reviews of facilities with similar noise conditions at property boundaries, petitioners have indicated

that based on zoning and land use conditions at proposed sites MDEP may relax the limit of 10 dBA increase at property lines. Berkshire Power Decision, 4 DOMSB 221, at

159-160; Dighton Power Associates Decision, 5 DOSMB 193, at 247. The Siting Board assumes that Brockton Power would also seek similar consideration from MDEP.

59. Tofias Trust argues that the Company has not demonstrated that the proposed electrical interconnect ROWs "are sufficiently wide" for the proposed interconnect and suggests that the placement of the transmission poles within the ROW may not be prudent (Tofias Trust Brief at 10). In response, Brockton Power states that the proposed ROW is adequate for the interconnect and that the project will conform fully with all applicable codes and safety requirements (Brockton Power Reply Brief at 11). The Siting Board

notes that Tofias Trust has raised only a general concern about the width of the ROW; it has not suggested that the location of this line raises unusual safety issues which require review by the Siting Board, or alleged any likely harm to any person or class of persons. In the absence of any specific concern which would require further analysis, the Siting Board concludes that compliance with existing codes and safety requirements applicable to transmission lines and with any safety requirements imposed by the MBTA should ensure the overall safety of the interconnect line. Additionally, we note that the relocation of the interconnect away from residences tends to decrease safety concerns.

60. The Company did not describe fencing, gates, or other security measures for preventing unauthorized access or activity during construction and operation of the proposed facility.

61. Major variables in the Company's modeling were: (1) surface area for ammonia evaporation; (2) air volume within the building housing the ammonia tank; (3) air exchange rate of the building ventilation system; (4) vent size; and (5) building and vent dimensions (Exh. HO-RR-4, at 6-30 to 6-32).

62. Brockton Power stated that aqueous ammonia and water treatment chemicals for the facility would be unloaded in the same location (Exh. BP-1, at 4.8-3). Due to the potential incompatibility of sodium hypochlorite and ammonia, the Siting Board recommends that these chemicals be delivered to different areas or that specific measures be incorporated into the chemical delivery area to protect against the potential interaction of these chemicals.

63. The Company indicated that input parameters for the SACTI model included: (1) proposed cooling tower dimensions; (2) air flow and water flow rates in cooling towers; (3) cooling tower operation parameters; (4) meteorological data from Logan Airport (1991-1995); (5) air mixing heights from the upper air station at Portland Maine; and

(6) clearness indices and solar insulation values from Blue Hill Observatory (Exh. HO-RR-4, at 6-20 to 6-21).

64. The Company indicated that icing can occur in two ways: (1) glaze icing occurs when the cooling tower drift droplets fall out of the plume and deposit as ice upon the surface; and (2) rime icing occurs when the saturated plume contacts the ground and forms a frost layer on the surface (Exh. HO-RR-4, at 6-19). The Company stated that it expects glaze icing will be limited to locations in close proximity to the cooling tower and will not cause impacts in off-site locations (id.).

65. As discussed in Section III.A.4, above, the Siting Board recognizes that in the event that zero ammonia technologies become commercially available for a facility of this size it is possible that MDEP may require that technology as part of its air permitting process. In that case, bulk ammonia storage would not be necessary.

66. The Siting Board notes that unlike fogging, icing is not transient, so a short period of icing could have impacts that last longer than the period of actual ice formation. However, we note that the Company anticipates that only rime or frost-like icing, and not glaze icing, will occur off-site.

67. Brockton Power indicated that there is limited space on site for worker parking and construction material laydown but stated that the Company has been discussing possible off site parking and laydown areas with other tenants of the Oak Hill Industrial Park (Exh. EFSB-T-3).

68. The Company described LOS as a qualitative assessment of a roadway's condition at various traffic volumes (Exh. BP-1, at 4.12-2). The Company indicated that this rating system considers roadway geometry, speed, travel delays, freedom to maneuver, and safety (id.). Based on these factors, the Company states that grades of A (for preferable conditions) through F are given to a roadway (id.). As an example, the Company indicated that a LOS C is a condition of stable flow and is considered desirable for design traffic in rural areas (id.).

69. For the traffic analysis, the Company made the conservative assumption that all 300 workers would drive to the site in separate vehicles (Tr. 2, at 337).

70. Other traffic turning directions analyzed are the left turn from Route 28 southbound onto Sargent's Way and the right turn from Sargent's Way onto Route 28 northbound (id.). Turning onto Sargents Way from Route 28 northbound was not assessed.

71. The Company indicated that it would not provide a traffic control officer on non-work days or on days when fewer than 30 workers would be on site (Exh. BP-1, at 4.12-4).

72. Electric and magnetic fields are produced by the operation of electric facilities, with electric fields being proportional to voltage and magnetic fields being proportional to the flow of electric current. Both fields are collectively known as EMF.

73. The Siting Board notes that EUA's and other utilities' existing transmission lines are not ancillary facilities as defined in G.L. c. 164, § 69G. However, in order to allow comprehensive analysis of environmental impacts associated with the construction and operation of the proposed generating facility, the Siting Board may identify and evaluate any potentially significant effects of the facility on magnetic field levels along existing transmission lines. See Sithe Fore River Decision, EFSB 98-7, at 102; IDC Bellingham Decision, EFSB 97-5, at 91-93; 1993 BECo Decision, 1 DOMSB 1, at 148, 192.

74. As described in the interconnect study, Brockton Power would install the new interconnect lines on double circuit poles along its proposed route, and install a ring bus at the plant site to provide the points of connection between the plant and the northern and southern sections of the F-19 line (Exh. HO-RR-7S (att. at 10-11, 15)).

75. The Company estimated that the maximum electric field levels from the interconnect line would be 0.5 kV per meter and 0.05 kV per meter at the northeast and southwest edges, respectively, of the MBTA ROW (Exh. EFSB-EM-1S (att. at 6-2, fig. 6.2)). The Company indicated that the maximum magnetic field level would decline to 0.02 kV per meter at the nearest residence, located 70 feet from the edge of the MBTA ROW (id.).

76. The Company indicated that the G-18 and F-19 lines (lowest conductor) are aligned 23.5 feet and 41.5 feet, respectively, from the west edge of the ROW, and that the E-20 line (center conductor) is aligned 37.5 feet from the east edge of the ROW

(Exh. EFSB-EM-1S (att. at fig. 5-2)).

77. The Company indicated that the measured magnetic field was 3 mG at the east edge of the ROW along Vital Street, the location of the nearest residence (Exh. EFSB-EM-1S (att. at fig. 4.3)). The Company did not provide EMF measurements for the nearest residence to the west, located 15 feet from the ROW on Litchfield Terrace; however, the Company's measurements along Edson Street and Vital Street show that existing magnetic fields decline to approximately 10 mG and 13 mG, respectively, at a distance of 15 feet from the west edge of the ROW (id. at figs. 4.2 and 4.3).

78. Under the regional load, regional dispatch, and regional transmission scenarios analyzed in the interconnect study, the 278 MW output of the plant would be split, flowing in part along the northern section and in part along the southern section of the F-19 line (Exh. HO-RR-7S (att. at Appendix A)). The power flow on the northern segment of the F-19 line between the plant and Auburn Street substation would constitute the larger share of plant output, ranging from 144 MVA to 276 MVA under the analyzed scenarios (id.)

79. Tofias Trust noted Dr. Valberg's statement that the FIELDS model and other available software were checked to ensure correct implementation of the laws of physics (Tofias Trust Brief, citing, Exh. EFSB-EM-1S (att. at 5-1)).

80. Tofias Trust cited (1) a cost of $3.4 million for Boston Edison Company to construct two 1.3-mile long underground 115 kV lines along a common route in Milford and Hopkinton, and (2) an additional cost of $1 million per mile for NEPCo to substitute underground construction for overhead construction along part of a 115 kV transmission line route in Lawrence (Tofias Trust Brief at 18-19, citing, Boston Edison Company, EFSB 96-1, at 103 (1997) ("1997 BECo Decision"); New England Power Company, 21 DOMSC, 325, 395 (1991)("1991 NEPCo Decision")).

81. For example, construction of a double-circuit transmission line along the same alignment of transmission structures as proposed for the single-circuit line would require placing the second set of conductors on the side of the transmission structures away from the tracks. Where lines are located closer to abutting property, power flow may be redistributed such as to increase EMF in that direction. At the same time, redistribution of power flow may reduce EMF levels in other directions. Additionally, operation of a double-circuit line could provide opportunities for using conductor phase configurations that reduce magnetic fields.

82. The analysis showed a cost increase of $7.04 million to substitute 5.1 miles of underground construction for overhead construction between two substations. 1988 Commonwealth Decision, 17 DOMSC 249, at 297, 304.

83. As applicable based on any such change, the Company should provide additional, updated analysis of the associated EMF impacts, as well as the associated environmental impacts with respect to visual impacts, tree clearing, wetlands, or other affected concerns, and provide a description of any measures to mitigate added environmental impacts.

84. The facilities and businesses currently occupying properties adjacent to the proposed site are (starting from the south and going clockwise): Brockton AWRF; various commercial establishments along Route 28; ARM (commercial/industrial building); F. W. Webb industrial supply operation; Mullare News Agency, Inc. distribution and offices; Mihos realty and a truck repair facility, and a building housing several manufacturing facilities (Exh. BP-1 (fig. 1-4)).

85. In the project interconnect study, provided after the close of hearings, EUA recommends that Brockton Power install two new interconnect lines on double circuit poles along the proposed route, rather than a single interconnect line as proposed by Brockton Power in this review (Exh. HO-RR-7S (att. at 3, 10-12, 15). If there is a significant change in the Company's proposed interconnect line, including the possible change of using a double-circuit interconnect line configuration as recommended in EUA's interconnect study, Brockton Power must inform the Siting Board of such change in order that the Siting Board may determine whether to inquire further into the matter (see Section III.J, above).

86. Brockton Power stated that it contacted Massachusetts Department of Public Health and the Brockton Department of Health and determined that no public health studies of the Brockton area are currently being performed (Exh. BP-1, at 4.3-2).

87. The term statistically significant at p 0.001 means that there is at most one chance in 1000 that the excess of observed cancer cases is due to chance alone (Exh. EFSB-H-2, at 5). Similarly, the term statistically significant at p 0.05 means that there is at most one chance in 20 that the excess of observed cancer cases is due to chance alone (id.). No statistical excesses at the p 0.01 were observed for Brockton (id.).

88. As noted above the EPA has promulgated regulations that also would set standards for emissions of PM-2.5 and that would revise the current standard for emissions of PM-10; however, these regulations are not currently in effect (Exh. HO-RR-4 (att. at 3-3)).

89. In a recent case, the Siting Board has independently reviewed the NRC Report and briefly summarized its findings with regard to epidemiological studies, in vitro studies, and animal studies. Sithe Mystic Decision, EFSB 98-8, at 87-88. The report concludes that the current body of evidence does not show that exposure to power frequency electric and magnetic fields presents a human health hazard. Id. at 87. The report also concludes that the aggregate epidemiological evidence does not support an association between magnetic field exposure and adult cancer, pregnancy outcome, neurobehavioral disorders, and childhood cancers other than leukemia. Id. at 87-88.

90. The Siting Board notes that its Technology Performance Standards at 980 CMR 12.00 could be construed as an energy policy of the Commonwealth adopted for the purpose of guiding the decisions of the Siting Board. The proposed project's compliance with 980 CMR 12.00 is discussed in Section I.C and III. B, above. The Commonwealth has not adopted any other energy policies pertaining to the Siting Board's review of generating facilities since G.L. c. 164, §69 J¼ was enacted.

91. Brockton Power correctly notes that many of the Commonwealth's environmental policies, including its policies promoting clear air and water, have health-related implications, and that in complying with these policies it also complies with health policies of the Commonwealth (Company Brief at 84).