TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ABS	American Bureau of Shipping
ac	acre
AC	alternating current
AIS	Automatic Identification System
APC	Area of Particular Concern
APE	Areas of Potential Effect
Applicants	Deepwater Wind Block Island, LLC and Deepwater Wind Block Island Transmission System, LLC
BIPCO	Block Island Power Company
BITS	Block Island Transmission System
BIWF	Block Island Wind Farm
BIWF/BITS ER	BIWF/BITS Environmental Report
BOEM	Bureau of Ocean Energy Management
CAD	Confined Aquatic Disposal
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO_2	carbon dioxide
Corps or Corps of Engineers	U.S. Army Corps of Engineers
CRMC	Rhode Island Coastal Resources Management Council
CZMA	Coastal Zone Management Act
dBA	A-weighted decibel
dB_{Peak}	peak sound level
dB_{cSEL}	cumulative sound exposure level
DP	dynamic positioning
DPS	distinct population segment
DPW	Department of Public Works
DWBI	Deepwater Wind Block Island, LLC
DWBIT	Deepwater Wind Block Island Transmission System, LLC
EA	Environmental Assessment
ECM	Environmental Compliance Monitor
EFH	essential fish habitat
EIS	Environmental Impact Statement
EMF	electromagnetic fields
EPA	U. S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
ft	feet
FONSI	Finding of No Significant Impact
FVTRs	Fishing Vessel Trip Reports
GPS	global positioning system

ha	hectare
HDD	horizontal directional drill
Hz	hertz
ICPC	International Cable Protection Committee
IHA	Incidental Harassment Authorization
IPCC	Intergovernmental Panel on Climate Change
ITS	Incidental Take Statement
JDA	Joint Development Agreement
kJ	kilojoule
km	kilometer
kV	kilovolt
LEDPA	least environmentally damaging practicable alternative
LNMs	Local Notices to Mariners
m	meter
m/s	meters per second
mG	milli-Gauss
mg/L	milligrams per liter
mi	mile
MHW	mean high water
MLLW	mean low low water
MLW	mean low water
MOA	Memorandum of Agreement
mph	miles per hour
MW	megawatt
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
nm	nautical mile
NMFS	National Maine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NVIC	Navigation Vessel Inspection Circular
O&M	operations and maintenance
OCS	Outer Continental Shelf
OER	Office of Energy Resources
Narragansett Bay OPAREA	US Navy Atlantic Fleet's Narragansett Bay Operating Area
OREIs	Offshore Renewable Energy Installations
PPA	power purchase agreement
ppm	parts per million
Project	Block Island Wind Farm and Block Island Transmission System
PSO	protected species observers
PUC	Public Utilities Commission
RES	renewable energy standard
REZ	Renewable Energy Zone

RFP	request for proposal
RI Ocean SAMP	Rhode Island Ocean Special Area Management Plan
RIDEM	Rhode Island Department of Environmental Management
RIDOT	Rhode Island Department of Transportation
RIEDC	Rhode Island Economic Development Corporation
RIHPHC	Rhode Island Historical Preservation and Heritage Commission
RIPDES	Rhode Island Pollutant Discharge Elimination System
RIWINDS	Rhode Island Winds Program
RMS	root mean square
RNA	Regulated Navigation Area
SAR	search and rescue
SAV	submerged aquatic vegetation
SCADA	supervisory control and data acquisition
SHPO	State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plans
THPO	Tribal Historic Preservation Office
TNEC	The Narragansett Electric Company d/b/a National Grid
TSS	Traffic Separation Schemes
URI	University of Rhode Island
USCG	United States Coast Guard
USFWS	U.S. Fish and Wildlife Service
USTs	underground storage tanks
VIA	Visual Impact Assessment
VRAP	Visual Resources Assessment Procedure
WEA	Wind Energy Area
WQC	Water Quality Certificate
WTGs	wind turbine generators

CENAE-R
Application Numbers: NAE-2009-789 and NAE-2012-2724

MEMORANDUM FOR RECORD

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Above-Numbered Permit Application

This document constitutes the Environmental Assessment, 404(b)(1) Guidelines Evaluation, Public Interest Review, and Statement of Findings for the following:

1. APPLICATION INFORMATION

APPLICANTS

Deepwater Wind Block Island, LLC (DWBI) and Deepwater Wind Block Island Transmission System, LLC (DWBIT; DWBI and DWBIT are each referred to herein as DWBI, DWBIT and together as Applicants).

APPLICATION/ORM NUMBER

NAE-2009-789 and NAE-2012-2724

WATERWAY & LOCATION

Rhode Island Sound; Block Island Sound; Trims Pond/Harbor Pond, Towns of New Shoreham and Narragansett, Rhode Island

LATITUDE & LONGITUDE

Five wind turbine generators (WTGs) are proposed to be built approximately 3 miles (mi) (4.8 kilometers [km]) off of the southeast coast of Block Island in Rhode Island Sound (Atlantic Ocean). The proposed coordinates for the five WTGs are listed in Table 1. The proposed location of the cable routes and ancillary terrestrial facilities are shown in Figures 1 through 3, Figure 5, and Figure 7. The figures are located at the back of this document.

Table 1. Coordinates for the Five BIWF Wind Turbine Generators

#	Coordinate Plane WGS 1984	
	Latitude	Longitude
WTG 1	41° 7' 32.596" N	71° 30' 27.230" W
WTG 2	41° 7' 11.770" N	71° 30' 50.208" W
WTG 3	41° 6' 53.060" N	71° 31' 16.183" W
WTG 4	41° 6' 36.710" N	71° 31' 44.810" W
WTG 5	41° 6' 23.050" N	71° 32' 15.540" W

PROPOSED WORK (Project purpose and need as stated by Applicants)

DWBI, a wholly owned indirect subsidiary of Deepwater Wind Holdings, LLC, proposes to develop the Block Island Wind Farm (BIWF), a 30-megawatt (MW) offshore wind farm located approximately 3 mi (4.8 km) southeast of Block Island, Rhode Island and 16 mi (25.8 km) south of the Rhode Island mainland. The BIWF will consist of five 6-MW WTGs, a submarine cable interconnecting the WTGs (Inter-Array Cable), and a 34.5-kilovolt (kV) transmission cable

approximately 7.2 mi (11.6 km) long from the northernmost WTG to an interconnection point on Block Island (Export Cable). In connection with the BIWF, DWBIT, also a wholly owned indirect subsidiary of Deepwater Wind Holdings, LLC, proposes to develop the Block Island Transmission System (BITS). The BITS is a 34.5-kV alternating current (AC) bi-directional submarine transmission cable that will run approximately 25.1 mi (40.4 km) from its interconnection on Block Island to the interconnection on the Rhode Island mainland. DWBI will construct, own, and operate the BIWF. DWBIT will develop the BITS and will likely transfer ownership of the BITS to The Narragansett Electric Company d/b/a National Grid (TNEC). BIWF and BITS are collectively referred to as the "Project" for the purpose of environmental analysis.

The Project will also include construction of one new substation at the site of an existing power generation facility on Block Island Power Company (BIPCO) property (Block Island Substation). The Block Island Substation will provide a point of interconnection for the power from the BIWF and will be the point of interconnection for BITS on Block Island. The Block Island Substation will consist of two adjoining switchyards: one dedicated to the BIWF (BIWF Generation Switchyard) and the other dedicated to the BITS (BITS Island Switchyard). The BITS will also include upgrades to the existing substation on the BIPCO property. The BITS will connect to the existing distribution system on the Rhode Island mainland that is operated by TNEC at the exiting Wakefield Substation in South Kingstown, Rhode Island via a new switchyard located on Rhode Island Department of Transportation (RIDOT) property in the Town of Narragansett, Rhode Island (Dillon's Corner Switchyard).

The purpose of the Project is to respond to the state of Rhode Island's expressed need for renewable energy as established by the Rhode Island Winds Program (RIWINDS), codified by Rhode Island State Legislation (RIGL §§ 39-26-1 et seq and 39-26.1-7); and as defined by the Joint Development Agreement (JDA) dated January 2, 2009. In combination, these actions called for:

- A renewable energy project that utilizes wind energy;
- A nameplate capacity of no more than 30 MWs and no more than eight turbines;
- A location in state waters;
- Cost-effectiveness;
- Enhancement of the electric reliability and environmental quality of the Town of New Shoreham, Rhode Island; and
- Interconnection between Block Island and the Rhode Island mainland.

According to DWBI, the BIWF is expected to generate approximately 125,500 MW-hours each year once it is fully operational, supplying enough energy to power approximately 17,200 Rhode Island households. Power from the BIWF will be delivered to the BITS at the Block Island substation. The BITS will export power from the BIWF to the Rhode Island mainland and will be capable of supplying power from the existing TNEC distribution system to Block Island. On June 30, 2010, DWBI and TNEC executed a power purchase agreement (PPA) for the sale of power from the BIWF to TNEC. The Rhode Island Public Utilities Commission (PUC) issued a written order on August 16, 2010 approving the PPA. The Rhode Island Supreme Court issued a written opinion on July 1, 2011 upholding the PUC order.

Block Island Wind Farm

The offshore portion of the BIWF is located entirely within Rhode Island state territorial waters (Figure 1). The BIWF WTGs, Inter-Array Cable, and a portion of the Export Cable are located

within the Rhode Island Renewable Energy Zone (REZ) established by the Rhode Island Coastal Resources Management Council (CRMC) (Figure 2). Onshore cables, the BIWF Generation Switchyard and other ancillary facilities associated with the BIWF will be located in the Town of New Shoreham (Block Island) in Washington County, Rhode Island (Figure 3). Construction staging and laydown for offshore construction is proposed to occur at the Quonset Point port facility in North Kingstown, also in Washington County, Rhode Island.

The WTGs will be attached to the seafloor using jacket foundations secured with four foundation piles or skirt piles driven to a depth of up to 250 feet (ft) (76.2 m) below the mudline. DWBI plans to install five WTGs with a hub height above mean low water (MLW) between 328 ft (100 m) and 387 ft (118 m) and a rotor diameter between 505 ft and 541 ft. (153.9 m and 164.9 m), for a total height between 581 ft and 659 ft (177.1 m and (201 m) above MLW (Figure 4). The blade clearance will range between 75 ft and 118 ft (22.9 m and 36 m) above MLW. In total, the WTG foundations and armoring of the Inter-Array Cable at the base of each foundation could result in up to 0.35 acre (ac) (0.15 hectare [ha]) of permanent seafloor disturbance. During construction, anchoring of the derrick barge, which is used during foundation installation, and spud cans from the jack-up barge, which is used during WTG installation, could result in up to 28.9 ac (11.7 ha) of temporary seafloor disturbance.

The Inter-Array Cable and submarine portion of the Export Cable will be installed using a jet plow to minimize sediment resuspension and seafloor disturbance during cable laying. The jet plow will be operated from a dynamic positioning (DP) cable-laying barge, which maintains its position with the use of thrusters instead of anchors. The jet plow may be a rubber-tired or skid-mounted plow with a width of approximately 15 ft (4.6 m) that will be pulled along the seafloor behind the cable-laying barge with assistance of a material barge. As the plow is pulled along the route behind the barge, the cable will be laid into the temporary, liquefied trench of up to 5 ft (1.5 m) in width through the back of the plow. The trench will be backfilled by the water current and the natural settlement of the suspended material. Prior to installation, DWBI will complete route clearance and pre-lay grapnel activities to identify and remove any obstructions in the cable route. In the event of snagging debris on the seabed, the grapnels shall be recovered to surface and the attached item examined and identified. If it is safe to bring the item (e.g., wires, chains, rope and other small items) inboard, it shall be detached from the grapnels and stored on the vessel for later disposal ashore. If the item is too large, then it shall be lowered back to the seabed, detached and its position logged for further investigation or recovery by other means.

The submarine cables will be buried to a target depth of 6 ft (1.8 meters [m]) below the seafloor. The actual burial depth will depend on the substrate encountered along the route and could vary from 4 ft to 8 ft (1.2 m to 2.4 m). DWBI will conduct a post-construction inspection using a multi-beam survey and shallow sub-bottom profiler (chirp) to document cable burial depth and to verify reconstitution of the trench. Based upon this post-construction inspection, DWBI will identify if there are areas where less than 4 ft (1.2 m) burial is achieved. In these areas, DWBI may elect to install additional protection such as concrete matting or rock piles. DWBI expects that no more than 1 percent of the Inter-Array and Export Cables will require additional protection, which will result in a maximum permanent impact of approximately 0.4 ac. Additional cable protection will be installed by anchored vessels. DWBI has committed to meeting with jurisdictional agencies, including the U.S. Army Corps of Engineers (Corps of Engineers or Corps), the Bureau of Ocean Energy Management (BOEM), the National Oceanic and Atmospheric Administration (NOAA), National Maine Fisheries Service (NMFS), the United States Coast Guard (USCG), the CRMC and the Rhode Island Department of Environmental Management (RIDEM), as well as the CRMC Fisheries Liaison prior to the installation of additional armoring.

The Export Cable will be brought ashore on Block Island at Crescent Beach using a short-distance horizontal directional drill (HDD) to install the cable conduit. The short-distance HDD will involve the excavation of a transition area trench for the Export Cable that will consist of an area approximately 6 ft to 10 ft (1.8 m to 3 m) wide, 12 ft (3.7 m) deep, and 60 ft long. The trench will be located between MLW and mean high water (MHW) within a 200-ft (61-m) permit corridor for the Export Cable shore landing. The final location for the excavated trench will be determined prior to construction, upon completion of final engineering design. DWBI will temporarily install steel sheet piling to stabilize the excavated trench. Spoils from trench excavation will be stored on the beach within the designated Work Area and returned to the trench after the cable is installed.

The HDD will enter through the shore side of the excavated trench and the cable conduit will be installed between the trench and the manhole. The cable will then be pulled from the excavated trench into the manhole through the conduit. A jet plow will be used to install the cables below the seabed at the landing location. To accomplish the necessary burial depth, the jet plow will be positioned over the trench at the MLW mark and be pulled from shore by the cable installation vessel. Once the vessel reaches a water depth of 20 ft (6.1 m) on the opposite shore, the plow lead lines will be detached from the vessel and transferred to a winch located within the temporary HDD Work Area. The winch will then be used to pull the jet plow the remaining distance up onto the beach and into the excavated trench.

The terrestrial BIWF facilities will not result in fill or discharge into wetlands and waters of the United States. The Export Cable will require one crossing of a navigable water attached to an existing bridge that spans Trims Pond and Harbor Pond on Beach Avenue for an approximately 45-foot span.

The design life of the BIWF is 25 years. The decommissioning of the BIWF WTGs and foundation will follow the same relative sequence as construction, but will occur in reverse. The Inter-Array Cable and the marine portion of the Export Cable will be cut below the mudline and abandoned in place.

Block Island Transmission System

The BITS is a proposed 34.5-kV AC bi-directional submarine transmission cable that will run approximately 25.1 mi (40.4 km) from the proposed BITS Island Switchyard on Block Island to its interconnection point with the TNEC distribution system in South Kingstown, Rhode Island (Figure 1). Of this total distance, approximately 19.8 mi (31.9 km) consists of the submarine cable from the shore landing on Block Island to the shore landing on the Rhode Island mainland. The BITS will be located within the state of Rhode Island, its territorial waters, and federal waters (approximately 9 mi on the Outer Continental Shelf [OCS]). The BITS will make landfall on Block Island at Crescent Beach adjacent to the BIWF Export Cable and will be collocated with the BIWF Export Cable within existing road rights-of-way to the BIPCO property (Figure 3). The BITS Cable route on the Rhode Island mainland will make landfall at Scarborough State Beach in the Town of Narragansett, Rhode Island and will follow existing state-owned rights-of-way to a new switchyard located on RIDOT property (Dillon's Corner Switchyard) and finally to the interconnection point at the existing TNEC Wakefield Substation in South Kingstown, Rhode Island (Figure 10).

Similar to the BIWF Export Cable, the BITS will be installed offshore using a jet plow to minimize sediment resuspension and seafloor disturbance. The submarine cable will be buried to a target depth of 6 ft (1.8 m) below the seafloor. The actual burial depth will depend on the substrate encountered along the route and could vary from 4 ft to 8 ft (1.2 m to 2.4 m). DWBIT will conduct a post-construction inspection using a multi-beam survey and shallow sub-bottom

profiler (chirp) to document cable burial depth and to verify reconstitution of the trench. Based upon this post-construction inspection, DWBI will identify if there are areas where less than 4 ft (1.2 m) burial is achieved. In these areas additional protection such as concrete matting or rock piles may be installed. DWBIT expects that no more than 1 percent of the submarine cable will require additional protection, which will result in an impact of 1 ac (0.4 ha) for additional cable armoring. Cable protection, will be installed from anchored vessels. DWBIT has committed to meeting with jurisdictional agencies, including the Corps, BOEM, NMFS, USCG, CRMC and RIDEM, as well as the CRMC Fisheries Liaison prior to the installation of additional armoring.

The offshore portion of the BITS will cross four existing telecommunications cables in federal waters (see Figure 6). According to the BIWF/BITS Environmental Report (BIWF/BITS ER), two of these cables are in service and two have been decommissioned. In addition, the BITS may cross a fifth abandoned cable that is identified on NOAA Chart 13218; however, DWBIT has been unable to verify the existence of this cable despite the screening level environmental and engineering surveys conducted in 2009 and the detailed geophysical, geotechnical, benthic habitat, and archaeological surveys completed in 2011. Where the BITS crosses each of the in-service cables, the BITS Cable will be installed directly on the seafloor and will be protected from external aggression using a combination of sand bags and concrete mattresses, resulting in up to 0.7 ac of permanent seafloor disturbance. Where DWBIT crosses inactive cables, the cables will be cut and cleared from the cable corridor during the pre-lay grapnel run. In the event of snagging debris on the seabed, the grapnels shall be recovered to surface and the attached item examined and identified. If it is safe to bring the item (e.g., wires, chains, rope and other small items) inboard, it shall be detached from the grapnels and stored on the vessel for later disposal ashore. If the item is too large, then it shall be lowered back to the seabed, detached and its position logged for further investigation or recovery by other means. As recommended by the International Cable Protection Committee (ICPC), DWBIT has committed to coordinate with the cable owners prior to crossing the operating cables and clearing the route of the inactive cables.

On Block Island, the BITS Cable will be brought ashore using a short-distance HDD as described for the BIWF Export Cable. The short-distance HDD for the BITS will require a separate trench from the Export Cable that will also be approximately 6 ft to 10 ft (1.8 m to 3 m) wide, 12 ft (3.7 m) deep, and 60 ft (18.3 m) long. The trench will be located between MLW and MHW within a 200-ft (61-m) permit corridor for the BITS shore landing. The final location for the excavated trench will be determined prior to construction, upon completion of final engineering design. DWBI will temporarily install steel sheet piling to stabilize the excavated trench. Spoils from trench excavation will be stored on the beach within the designated Work Area and returned to the trench after the cables are installed.

On the mainland, the BITS Cable will be brought ashore using a long-distance HDD. The long-distance HDD option will involve installation of the cable conduit via a long-distance HDD and require installation of a temporary cofferdam located between 2,250 ft and 3,650 ft (685.8 m and 1112.5 m) offshore from Scarborough State Beach within the BITS Permit Corridor (Figure 5). The cofferdam will be constructed using steel sheet piles to create an enclosed area approximately 20 ft by 50 ft (6.1 m by 15.2 m) that will result in removal and fill of approximately 333 cubic yards of sediment. In total, the footprint of the temporary cofferdam is expected be 0.02 ac (0.01 ha).

The terrestrial BITS facilities will not result in fill or discharge into wetlands and waters of the United States. On Block Island, the BITS will be collocated with the BIWF Export Cable attached to an existing bridge that spans Trims Pond and Harbor Pond on Beach Avenue.

DWBIT proposes to operate the BITS in perpetuity. BOEM regulation 30 Code of Federal Regulations (CFR) 585.910 requires that all facilities be decommissioned to 15 ft (4.6 m) below

the mudline. The decommissioning of the BITS Cable at the end of its useful life has been therefore included in this National Environmental Policy Act (NEPA) analysis. The decommissioning of the submarine BITS Cable will follow the same relative sequence as construction; the cable will be removed using a jet plow.

Applicants' Proposed Measures for Avoidance and Minimization

The Applicants have conducted an extensive analysis of alternatives, including alternative sites for the BIWF within the REZ; alternative locations for the marine and terrestrial portions of the BIWF Export Cable and BITS; alternative BIWF and BITS interconnection and switchyard locations; alternate technologies; and a no build alternative to avoid impacts on environmental resources to the extent possible.

The state of Rhode Island has invested considerable resources in conducting scientific studies necessary to determine which areas of coastal waters near Block Island are suitable for offshore wind development through the Rhode Island Ocean Special Area Management Plan (RI Ocean SAMP), a multi-year marine spatial planning process led by the CRMC with input from many marine stakeholders, including NMFS, Corps of Engineers, USCG, the Narragansett Indian Tribe, the University of Rhode Island (URI), RIDEM, commercial and recreational fishermen and the public. These studies led to the identification of the REZ within which DWBI was required to site the WTGs. The identification of the REZ reflects substantial efforts undertaken with the involvement of agencies and stakeholders to choose a location for offshore WTGs that minimizes the potential impact on natural resources (benthic ecology, birds, marine mammals, sea turtles, fisheries resources, and habitat) and existing human uses (commercial and recreational fishing, cultural and historic sites, recreation and tourism, marine transportation, navigation and infrastructure).

DWBI conducted a WTG array alternatives analysis within the REZ to further avoid, minimize and mitigate effects to environmental resources. The original project plan in 2009 included the installation of eight 3.6-MW WTGs. DWBI refined its plan and is now proposing five 6-MW direct-drive WTGs, which are the next generation of turbine technology. This reduction in the number of WTGs minimizes the visual impacts, bottom disturbance, and other potential environmental effects. The proposed jacket foundation technology allows for placement of WTGs in the deeper regions of Rhode Island state waters, which allows the BIWF to be located as far as possible offshore while still providing the state of Rhode Island with the benefits of a project located in state territorial waters. In addition, DWBI has conducted over four years of studies throughout the REZ, including extensive federal and state agency consultations and public outreach to select a location that minimizes impacts to the maximum extent possible. As proposed, the WTGs avoid significant, direct, and otherwise unavoidable impacts on important sea duck foraging habitat and important benthic habitat, specifically glacial moraine. See Section 5, Alternatives Analysis, for a full discussion of alternatives considered for the Project.

Regarding avoidance and minimization of impacts on terrestrial resources, the Applicants have specifically sited the onshore portions of the BIWF and BITS along existing road rights-of-way and within currently developed areas to the maximum extent practicable. Consequently, the onshore portions of the Project will not result in discharge or fill of wetlands or waters of the United States.

The following is a bulleted list of the proposed measures for avoidance and minimization (refer also to Section 7 for more detailed discussion of avoidance and minimization measures, as well as mitigation, for impacts on these resources):

- **Geologic Resources and Shallow Hazards** – The Applicants have sited the Project facilities to avoid shallow hazards. Jet plowing, HDD techniques, and use of DP vessels to install the cables will minimize sediment disturbance and alteration. DWBIT has also designed cable crossings to avoid impacts on the operating telecommunication cables. Terrestrial facilities have been primarily located along existing rights-of-way and in currently developed areas.

- **Water Quality** – The Applicants have sited onshore facilities primarily along existing rights-of-way and in currently developed areas. The Applicants will require all construction and operation vessels to comply with regulatory requirements related to the prevention and control of spills and discharges. The Applicants will prepare a Project-specific Spill Control and Response Plan prior to construction and operation to further minimize risk and will develop an HDD Contingency Plan prior to construction for the inadvertent releases of drilling fluid to further minimize the risk associated with a frac-out.

- **Benthic Resources** – DWBI has sited the WTGs within the REZ to minimize potential impacts on natural resources. Both the BIWF and BITS marine facilities have been sited to avoid impacts on potentially sensitive benthic communities, including eelgrass beds and hard bottom habitats. Only one area of hard bottom habitat will be temporarily disturbed by anchor placement during installation of WTG 5 by DWBI. DWBI will develop an anchor plan to minimize impacts on this hard bottom area during construction.

- **Finfish Resources and Essential Fish Habitat** – The Applicants have sited the cable routes and WTGs to avoid direct impacts on sensitive habitats such as eelgrass known to be used by some finfish species throughout various lifestages. As stated above, DWBIT has also avoided other potentially sensitive habitat such as hard bottom substrates to the maximum extent practicable. Additionally, the Applicants will implement techniques such as soft-starts to minimize impacts on finfish resources during impact and vibratory pile driving of the WTG foundations and cofferdam.

- **Marine Mammals and Sea Turtles** – All Project vessels will follow NOAA guidelines for marine mammal strike avoidance. The Applicants will employ visual monitoring and mitigation measures as directed by NMFS permits for pile driving and during DP vessel use during construction. Impact avoidance and minimization measures will include shut-down procedures, marine mammal monitoring protocols, and use of soft-starts during impact and vibratory pile driving. The Applicants will prepare a Project-specific Spill Control and Response Plan prior to construction and operation to further minimize risk.

- **Avian and Bat Species** – The Applicants completed 3 years of pre-application avian and bat surveys under a protocol reviewed and approved by the U.S. Fish and Wildlife Service (USFWS) and the Corps. Results of the surveys indicated that the proposed WTG location, southeast of Block Island, has the least potential for interaction with avian and bat species of any location within the REZ. DWBI has reduced the number of WTGs from eight to five, which also minimizes the potential for interaction between WTGs and avian and bat species. Onshore facilities have been primarily buried and located along existing rights-of-way and in currently developed areas to minimize interaction with avian and bat species.

- **Acoustic Environment** – Pile driving will occur during daylight hours starting approximately 30 minutes after dawn and 30 minutes prior to dusk unless a situation arises where ceasing the pile-driving activity would compromise safety (both human

health and environmental) and/or the integrity of the Project. In-air noise from onshore HDD activities will be minimized, as necessary.

- **Marine Cultural Resources** – The Applicants have engaged the Narragansett Indian Tribe and the Wampanoag Tribe of Gay Head (Aquinnah) in marine survey protocol design, execution of the surveys, and interpretation of the results. The Applicants sited the WTGs, Inter-Array Cable, and Export Cable outside of known submerged cultural resources, and the site-specific investigation did not identify any evidence of archaeologically sensitive paleosols or pre- and post-contact period cultural materials within the footprint of the Project components.
- **Terrestrial Archaeological Resources** – The Applicants have engaged the Narragansett Indian Tribe and the Wampanoag Tribe of Gay Head (Aquinnah) in terrestrial survey protocol design, execution of the surveys, and interpretation of the results. The Applicants have sited the terrestrial components of the Project within previously disturbed areas to the extent practicable and have taken into consideration the results of terrestrial archaeological studies and agency and tribal input during development of the proposed Project.
- **Aboveground Historic Resources and Aesthetics** – DWBI has sited the WTGs as far as possible offshore, while still remaining in state territorial waters and the REZ. DWBI has reduced the number of turbines from eight to five and will install them with a uniform design, speed, height, and rotor diameter. The white or light-grey color (less than 5 percent grey tone) of the turbines generally blends well with the sky and eliminates the need for daytime Federal Aviation Administration (FAA) warning lights or red paint marking of the blade tips.
- **Marine Uses** – DWBI has not proposed operational phase vessel exclusions around the WTGs or other areas of the Project. Cables will be buried at a target depth of 6 ft (1.8 m) below the seafloor to avoid interactions with fishing gear and/or anchors to the maximum extent practicable. The Applicants will implement communication plans during construction to inform commercial and recreational fishermen, mariners, and recreational boaters of construction activities and vessel movements facilitated through a Project website, public notices to mariners and vessel float plans, and a fisheries liaison. The Applicants will submit information to the USCG to issue Local Notices to Mariners (LNMs) during offshore installation activities and has established designated construction vessel traffic routes, construction standby areas, and Work Areas. WTGs will be marked and lit with both USCG and FAA approved navigational aids. The WTG located in the center of the WTG Array will also include a sound signal.
- **Land Use** – The Applicants have sited onshore facilities primarily along existing rights-of-way and in currently developed areas. HDD will help to avoid disturbance to shoreland areas and tidal wetlands. Construction associated with cable landings and onshore facilities will not be completed in the summer months to avoid the peak tourist season.
- **Transportation** – The Applicants will prepare Traffic and Transportation Plans to minimize vehicle traffic impacts during construction. Designated construction vessel traffic routes, construction standby areas, and Work Areas will be utilized to minimize potential impacts on mariners. The Applicants will implement communication plans during construction to inform commercial and recreational fishermen, mariners, and recreational boaters of construction activities and vessel movements facilitated through a Project website, public notices to mariners and vessel float plans, and a fisheries liaison.

- **Human Health and Safety** – The Applicants have designed the BIWF and BITS facilities to account for site-specific environmental conditions. They will develop an overall health and safety plan prior to construction and ensure that all contractors and third parties perform their work in accordance with the overall plan and their own specific health and safety plans. Workers will receive training in health, safety, and emergency response prior to commencing work on the Project. The Applicants will each prepare Project-specific Spill Control and Response Plans prior to construction and operation to further minimize risk.

Applicants' Proposed Compensatory Mitigation

The BIWF and BITS will not result in unavoidable adverse impacts on wetlands, streams and other aquatic resources that require compensatory mitigation as defined in regulations (40 CFR 230.92) and implementing guidance.

Applicants' Proposed Mitigation for Impacts not Regulated under 40 CFR 230.92 but subject to review under NEPA:
The Corps, in consultation with federal, tribal, and state agencies, has been working with the Applicants to identify appropriate mitigation and monitoring measures for impacts on environmental resources such as terrestrial archaeology and historic properties. Mitigation measure are discussed further in Section 7 of this document and specified in special conditions to permit authorization in Section 11.

PROJECT PURPOSE DETERMINED BY CORPS

Basic Project Purpose[1]

The basic Project purpose is to develop and construct an offshore wind farm and to sell electricity into the wholesale market and to construct a bi-directional submerged transmission cable to provide electricity to the residents of Block Island.

Overall Project Purpose[2]

The overall purpose of the BIWF and BITS is to construct an offshore wind energy project consistent with the state of Rhode Island's expressed need for offshore wind energy as established by the RIWINDS, codified by Rhode Island law (RIGL §§ 39-26-1 et seq and 39-26.1-7); and as defined by the JDA.

Water Dependency Determination

As an offshore wind energy project, the BIWF and BITS need to be situated offshore in the water. Consequently, the fill activities associated with the Project, which consist of the Inter-Array Cable armoring at the base of the WTG foundations, protective cable armoring for submarine Export Cable and BITS, and construction of a temporary cofferdam, are water-dependent.

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[1] The basic project purpose is the fundamental or irreducible reason for the project that is used by the Corps to determine if the project action is water dependent for the purposes of the Section 404(b) Guidelines.
[2] The overall project purpose is a more detailed, comprehensive, and specific statement of the project's purpose that takes into account the needs of the public and the Applicants. The overall project purpose is used by the Corps in evaluating practicable alternatives in accordance with Section 404(b) Guidelines, and in some instances, like here, in developing a reasonable range of alternatives considered under NEPA.

BOEM PURPOSE AND NEED

BOEM received an application from DWBIT requesting a Right-of-Way Grant for an 8-nautical mile (nm)-long (14.8-km), 200-ft (61-m)-wide corridor in federal waters on the OCS to connect their proposed offshore wind farm, located in Rhode Island state waters approximately 2.5 nm southeast of Block Island, to the Rhode Island mainland. BOEM determined there was no overlapping competitive interest in the proposed Right-of-Way Grant area off Rhode Island and published a "Notice of Determination of No Competitive Interest" in the *Federal Register* on August 7, 2012 under Docket ID: BOEM-2012-0068. More information on BOEM's process can be found at: http://www.boem.gov/Renewable-Energy-Program/State-Activities/RI/Block-Island-Transmission-System.aspx.

SITE DESCRIPTION

Block Island Wind Farm

The BIWF will be located an average of approximately 3 mi (4.8 km) southeast of Block Island, and approximately 16 mi (25.7 km) south of the Rhode Island mainland. The WTGs, Inter-Array Cable, and a portion of the Export Cable will be located within the REZ established by the CRMC through the RI Ocean SAMP. The WTGs will be arranged in a radial configuration spaced approximately 0.5 mi (0.8 km) apart in waters 75 ft to 95 ft (22.9 m to 29 m) deep at mean low low water (MLLW). The Inter-Array Cable will connect the five WTGs for a total length of 2 mi (3.2 km) from the northernmost WTG to the southernmost WTG.

The submarine Export Cable will originate at the northernmost WTG and travel 6.2 mi (10 km) to a manhole at the parking lot of Crescent Beach on Block Island. Water depths along the Export Cable submarine route range up to approximately 121 ft (36.9 m) in the deepest areas of the route. The manhole will serve as the transition point where the submarine portion of the Export Cable will be anchored and spliced with the buried terrestrial portion of the cable. The manhole will be located within the boundary defined by the temporary HDD Work Area in the parking lot of Crescent Beach off of Corn Neck Road. From the manhole at the Town Beach parking lot, the Export Cable will follow an upland route along existing public road rights-of-way for 0.8 mi (1.3 km) to the BIPCO property. The cable will be buried underground except where the cable crosses the bridge between Trims Pond and Harbor Pond for a distance of approximately 45 ft (14 m). The buried terrestrial portion of the Export Cable will be collocated in the same concrete-encased duct bank as the buried terrestrial portion of the BITS Cable. At the BIPCO property, the Export Cable will transition to overhead poles and will be collocated with the BITS Cable for a distance of up to 0.2 mi (0.3 km). The Export Cable will terminate at the BIWF Generation Switchyard, which is part of the Block Island Substation. In total, the Export Cable will be approximately 7.2 mi (11.6 km) from the northernmost WTG to the interconnection on the BIPCO property.

Block Island Transmission System

The BITS will originate on Block Island at the BITS Island Switchyard located within the Block Island Substation on the BIPCO property. As part of the BITS, the existing BIPCO Substation will be expanded and upgraded to interconnect the BITS with BIPCO's facilities.

The facilities associated with the Block Island Substation and the BIPCO Substation expansion will require development of up to 0.5 ac (0.2 ha) on the BIPCO property. Up to an additional 0.6 ac (0.2 ha) will be utilized during construction to support staging, stormwater management measures, and other temporary construction activities. The terrestrial portion of the BITS Cable on Block Island will follow the same cable route as the terrestrial portion of the BIWF Export

Cable to a second, separate BITS manhole in the parking lot of Crescent Beach. Similar to the BIWF Export Cable, the manhole will serve as a transition point where the buried terrestrial portion of the BITS Cable will be spliced with the submarine cable. The BITS manhole will be located adjacent to the BIWF manhole within the boundary defined by the temporary HDD Work Area in the parking lot of Crescent Beach.

From the Block Island manhole, the BITS will traverse federal and state submerged lands in Rhode Island Sound from Block Island to Narragansett. The portion of BITS through federal waters consists of approximately 9 mi (14.5 km) on OCS Official Protraction Diagram Blocks 6711, 6761, 6810, and 6811. DWBIT will obtain a Right-of-Way Grant from BOEM for a BITS route corridor on the OCS.

The BITS will make landfall in southern Narragansett, Rhode Island at Scarborough State Beach. The submarine cable will be buried beneath the beach and Ocean Road to a transition vault beneath the RIDEM parking lot behind Scarborough State Beach. From the transition vault at the RIDEM parking lot, the cable continues as a buried terrestrial cable within state-owned roadways for approximately 3.4 mi to a new switchyard on RIDOT property used for salt storage between Point Judith Road/Route 108 and the on-ramp to Route 1 North. The route then continues as a buried cable within state roads for another 0.9 mi to the interconnection point at the existing TNEC Wakefield Substation in South Kingstown, Rhode Island. In total, the BITS Cable will be approximately 25.1 mi (40.4 km) from the Block Island Substation to its interconnection with the TNEC system in South Kingstown, Rhode Island. Of this total, approximately 19.8 mi (31.9 km) is submarine from the transition vault on Block Island to the transition vault on Scarborough State Beach. Water depths along the BITS submarine cable route range up to approximately 129 ft (39 m) in the deepest areas of the route.

Construction and Operation Facilities

An affiliate of the Applicants has executed an agreement for the rights to acreage at the Quonset Point Business Park port facility, which will serve as a logistics hub for the development of the Project. The Quonset Point Business Park port facility is located in North Kingstown, Rhode Island approximately 32.2 mi (51.9 km) from the WTG Array (Figure 7). DWBI has also proposed a designated Work Area around the WTGs and standby areas for marine construction vessels. The boundaries of these areas will be communicated to the marine vessel public through LNMs and the DWBI's website. The Applicants will not impose any restrictions on other vessels transiting through these stand-by areas or the rest of the Project Area during construction.

DWBI expects to locate an operations and maintenance (O&M) facility, which will include a shore operations center and a control room on an existing waterfront parcel in the Point Judith area. The facility will be a combination of office, maintenance shop, and a small dockside facility.

2. AUTHORITY

☒ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §403).
☒ Section 404 of the Clean Water Act (33 U.S.C. §1344).
☐ Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C.1413).

3. SCOPE OF ANALYSIS

(1) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §403)

The Corps regulates work and structures that are located in, or that affect navigable waters of the United States under Section 10 of the Rivers and Harbors Act of 1899. Navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce (33 CFR 329). The Corps's definition of navigable waters extends shoreward up to the MHW line. The high tide line represents the intersection of the land with the water's surface at the maximum height reached by a rising tide.

(2) Section 404 of the Clean Water Act (33 U.S.C. §1344)

The Corps regulates discharge of dredged or fill material into waters of the United States under Section 404 of the Clean Water Act. Waters of the United States, as defined in Corps regulations (33 CFR 328), is a broader term than navigable waters. This term includes navigable waters and all their tributaries, adjacent wetlands, and other waters or wetlands where degradation or destruction could affect interstate or foreign commerce. Discharge of dredged material means any addition of material excavated or dredged from waters of the United States, including redeposit of dredged material other than incidental fallback (33 CFR 323.2). Corps regulations define fill to be material placed in waters of the United States. where the material has the effect of either replacing any portion of a water of the United States with dry land or changing the bottom elevation of any portion of water (33 CFR 323.2). Discharge of fill material includes the building of any structure, infrastructure, or impoundment requiring rock, sand, dirt, or other material for its construction and placement of fill that is necessary for the construction of any structure or infrastructure in a water of the United States.

Tables 2 and 3 provide a list of the components of the BIWF and BITS, respectively, that are considered as work or structures in navigable waters requiring permit authorization under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.

Table 2. BIWF Components Requiring Permit under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act

Activity	Jurisdiction	Construction (Temporary)	Operation (Permanent)
WTG foundations [a]	Section 10/ Section 404	0.07 ac per WTG/ 0.35 ac total	0.07 ac per WTG/ 0.35 ac total 355.6 cubic yards total
WTG foundation cable armoring	Section 10/ Section 404	n/a	71.1 cubic yards per WTG/ 355.5 cubic yards total
Inter-Array Cable	Section 10	n/a	2 linear mi
Inter-Array Cable armoring [b]	Section 10/ Section 404	n/a	314.1 cubic yards/ 0.1 ac
Export-Cable (up to MHW)	Section 10	n/a	6.2 linear mi
Export Cable crossing at Trims Pond on Block Island	Section 10	n/a	45 linear ft
Export Cable armoring [b]	Section 10/ Section 404	n/a	968.9 cubic yards/ 0.3 ac

Activity	Jurisdiction	Construction (Temporary)	Operation (Permanent)
Temporary trench between MLW and MHW for Export Cable landfall (short-HDD option) [c]	Section 10/ Section 404	266.7 cubic yards/ 0.01 ac	n/a

[a] The pilings associated with the WTG foundations are not considered fill in accordance with 33 CFR 323.3(c)(2); however, all pilings placed in navigable waters of the U.S. require authorization under Section 10.
[b] Additional cable protection consisting of concrete matting, rock, or comparable material estimated for up to 1 percent of cable.
[c] Temporary trench on Block Island with estimated dimensions of up to 10 ft (3 m) wide, 60 ft (18.3) long, and 12 ft (3.7 m) deep.

Table 3. BITS Components Requiring Permit under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act

Activity	Jurisdiction	Construction (Temporary)	Operation (Permanent)
BITS Cable (Block Island to Rhode Island mainland)	Section 10	n/a	19.8 linear mi
BITS Cable crossing at Trims Pond on Block Island	Section 10	n/a	45 linear ft
BITS Cable armoring [a]	Section 10/ Section 404	n/a	5,262.2 cubic yards/ 1.7 ac
Sediment excavation and refill for temporary trench between MLW and MHW for BITS landfall on Block Island via short-HDD [b]	Section 10/ Section 404	266.7 cubic yards/ 0.01 ac	n/a
Sediment excavation and refill and sheet piles for an offshore cofferdam for BITS landfall on the mainland (long-HDD option) [c]	Section 10/ Section 404	333.3 cubic yards/ 0.02 ac	n/a

[a] Includes proposed cable armoring at two known active cable crossings and additional cable protection consisting of concrete matting, rock, or comparable material estimated for up to 1 percent of BITS Cable.
[b] Temporary trench on Block Island with estimated dimensions of up to 10 ft (3 m) wide, 60 ft (18.3) long, and 12 ft (3.7 m) deep.
[c] Cofferdam itself will consist of sheet piles enclosing an area 20 ft.(6 m) by 50 ft (15.2 m) to a depth of up to 9 ft. (2.7 m).

(3) National Environmental Policy Act (NEPA)

i. Factors to be considered in determining scope of analysis for NEPA: Determine whether or not the regulated activity comprises "merely a link" in a corridor type project; whether there are aspects of the upland facility in the immediate vicinity of the regulated activity which affect the location and configuration of the regulated activity; the extent to which the entire project will be within the Corps jurisdiction; and the extent of cumulative federal control and responsibility.

ii. Determined scope. As stated previously, the majority of the facilities associated with the BIWF and BITS are located within waters of the United States and, therefore, require Section 10/404 approval. Additionally, because all of the BIWF and a portion of the BITS are located within state territorial waters, the Corps has served as the federal Lead Agency responsible for the NEPA analysis for the BIWF and BITS.

Consequently, the NEPA analysis on this application encompasses the entire proposed BIWF and BITS, including all submarine and terrestrial facilities inland beyond the MHW line that represents the physical limit of the Corps permit jurisdiction under Section 10. For the purposes of this Environmental Assessment (EA), "Project Area" refers to the location of the BIWF and BITS facilities.

Because a portion of the BITS requires a Right-of-Way Grant from the BOEM, BOEM has participated in the NEPA analysis and federal inter-agency consultations as a Cooperating Agency.

This document presents the Corps NEPA analysis, as the lead Federal Agency with BOEM as the Cooperating Agency, of the BIWF and BITS in an EA as specified by Council on Environmental Quality (CEQ) regulations (40 CFR 1508.9) and Corps implementing NEPA regulations (33 CFR 325 Appendix B). Section 1 of this document addresses the need for the proposed action, Section 4 addresses public involvement, Section 5 addresses alternatives, Section 6 evaluates the Project against the 404(b)(1) guidelines, Section 7 addresses impacts and benefits on the affected environment, and Section 8 addresses cumulative impacts and agencies consulted.

This EA considers construction and operation of the BIWF and BITS, as well as the proposed decommissioning concept for the BIWF marine and terrestrial Project facilities. As stated previously, the decommissioning concept for the BIWF WTGs and foundations will follow the same relative sequence as construction, but will occur in reverse. The Inter-Array Cable and the marine portion of the Export Cable will be cut below the mudline and abandoned in place. Onshore, the Export Cable will be removed and recycled. A detailed Decommissioning Plan will be required for Corps review and approval prior to the commencement of decommissioning activities at the end of the Project's useful life.

DWBIT proposes to operate the BITS in perpetuity; however, the removal of the BITS Cable at the end of its useful life is considered as part of this EA. As stated previously, the decommissioning of the submarine BITS Cable will follow the same relative sequence as construction; the cable will be removed using a jet plow. A detailed Decommissioning Plan will be required for Corps and BOEM review and approval prior to the commencement of decommissioning activities at the end of the Project's useful life.

The Applicants submitted a detailed BIWF/BITS ER with corresponding site-specific resource studies to the Corps for review of the BIWF and BITS in their entirety, including all marine and terrestrial components. This BIWF/BITS ER and appendices dated September 2012, the modification to the BIWF/BITS ER dated September 2013, and other relevant supplemental reports and filings, as well as the Applicants' responses to agency and public comments, are considered part of the administrative record and are collectively referred to as the BIWF/BITS ER. The Corps has considered the information presented in this BIWF/BITS ER and has consulted with federal, tribal, and state resource agencies and representatives in completing the evaluation of both the BIWF and BITS. The Corps has used these site-specific studies and agency consultations, along with the information presented in the RI Ocean SAMP and public comments received in response to the Corps public notice on the Project and comments heard at the state public hearings to evaluate the benefits and impacts of the BIWF and BITS. The Statement of Findings is based on the evaluation as presented in

these sections, as well as the inter-agency consultations completed for the BIWF and BITS. Refer to Section 11 for the Statement of Findings.

(4) National Historic Preservation Act (NHPA) "Permit Area"

i. Factors to be considered in determining permit area for NHPA: Determine whether activities outside waters of the United States are included based on the following (see 33 CFR 325 Appendix C): 1) The activity would or would not occur *but for* the authorization of the work or structures within the waters of the United States; 2) Whether the activity is integrally related to the work or structures to be authorized within waters of the United States (or, conversely, the work or structures to be authorized must be essential to the completeness of the overall project or program); and 3) Whether the activity is directly associated (first order impact) with the work or structures to be authorized.

ii. Determined scope: The Corps coordinated with the Rhode Island Historical Preservation and Heritage Commission (RIHPHC) and other consulting parties to identify the Areas of Potential Effect (APE) for evaluating effects to historic cultural resources with respect to compliance with the requirements of Section 106 of the NHPA. The APE was subdivided into the following major categories for the BIWF and BITS:

- BIWF Submerged Archaeology APE, which consisted of a 9,843-ft (3,000-m) area centered on the Inter-Array Cable where anchoring will occur during WTG foundation installation and a 984-ft (300-m) cable corridor;
- BIWF Terrestrial Archaeology APE, which consisted of the overland portions of the BIWF Export Cable, including new switchyards, drill pits, staging areas, and any other temporary or permanent workspaces where ground disturbances will occur;
- BIWF Terrestrial Components APE (for aboveground historic resources), which consisted of a 30-mi area, including locations on Block Island and the Rhode Island mainland with potential views of one or more of the BIWF WTGs and a one half-mile radius around the location of the proposed Block Island Substation;
- BITS Submerged Archaeology APE, which consisted of a 984-ft (300-m) cable corridor;
- BITS Terrestrial Archaeology APE on Block Island and Narragansett, which consisted of the overland portions of the BITS Cable, including new switchyards, drill pits, staging areas, and any other temporary or permanent workspaces where ground disturbance will occur; and
- BITS Terrestrial Components APE (for aboveground historic resources), which consisted of a one half-mile radius around the location of aboveground facilities on Block Island and in Narragansett.

The Rhode Island State Historic Preservation Officer (SHPO) concurred with the APE for the marine and terrestrial archaeological assessments and for the historic properties assessment in their review of the survey protocols. Upon review of the study reports, the RIHPHC concluded in a letter to the Corps dated November 7, 2012, that the APEs for the BIWF and BITS as described in the BIWF/BITS ER are appropriately drawn.

(5) Endangered Species Act (ESA) "Action Area"

i. Action Area means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.

ii. Determined scope: The Action Area in this case is the area where marine and terrestrial facilities are proposed to be located. The marine and terrestrial wildlife in Rhode Island Sound and Block Island Sound and coastal areas were considered in the evaluation of potential effects.

4. PUBLIC INVOLVEMENT

a. A pre-application meeting was held on May 5, 2009 with the Applicants and their consultants plus representatives from NMFS, USFWS, U.S. Environmental Protection Agency (EPA), CRMC and RIDEM. The Corps received permit applications for the BIWF and the BITS on June 1, 2012 and deemed the applications complete on September 27, 2012. The Corps issued a public notice on October 2, 2012 to initiate a 45-day public comment period on the BIWF and BITS applications. The public comment period was later extended to December 31, 2012. The public notice was further extended to February 10, 2013 when the public comment period was officially closed.

Subsequently, the Corps received permit application modifications from the Applicants dated September 26, 2013 for an alternative cable landfall on the mainland and withdrawal of the long-distance HDD landing option off of Block Island. The Corps issued a new public notice on November 26, 2013 to initiate a 30-day public comment period for the revised cable landfall location.

b. **Comments and issues raised.** Prior to and in response to the Corps' public notice, we received a total of 129 agency and public comments. The Corps received 30 letters, emails, and petitions expressing positive benefits of the Project and/or general support for the Project. Those in favor expressed the following general comments:

1. The Project provides high quality, consistent, affordable energy and will add to the local economy through ecotourism.
2. Moving towards green energy solutions outweighs the dependency on diesel power.
3. The BIWF will help reduce carbon emissions.
4. The Project will support job creation.
5. The Project is good for the country's clean energy future, is renewable and reliable; it represents a move towards the nation's energy security.
6. Reduced electricity rates will benefit business owners on Block Island.
7. Views of the BIWF WTGs are positive.

In addition, a number of questions and concerns were raised by commenters regarding environmental impacts and/or general opposition to the Project. The substantive issues and concerns that were raised are captured and listed in Section 4.g. The Corps has considered these comments in our review and has provided responses in Section 4.g.

c. **Additional issues identified by the Corps.** There were no other issues identified by the Corps that were not raised during the public notice period.

d. **Issues/comments forwarded to the Applicants and Applicants' response.** A letter dated March 21, 2013 was sent to the Applicants summarizing the comments and giving them an opportunity to respond. The Applicants provided detailed responses in letters dated May 22, 2013 and February 13, 2014, which are contained in the administrative record.

e. **Has a request for a public hearing been made?** Yes, public hearing requests were received in response to the public notice.

Requests for public hearings shall be granted, pursuant to 33 CFR 327.4 (b), "unless the district engineer determines that the issues raised are insubstantial or there is otherwise no valid interest to be served by a hearing." The Corps conducts hearings on an as-needed basis, depending on the extent of information available, and whether there have already been opportunities for public participation in the review of the proposed Project.

Issues raised regarding the proposed activity were clearly stated in response to the Corps public notice, and these issues are 1) readily addressed through existing or obtainable information; 2) have been or will be more appropriately addressed by other federal agencies; and/or 3) have been or will be more appropriately addressed at the state and municipal level.

The public has had ample opportunity to express their interest in the Project in response to not only the Corps' October 2, 2013 public notice and two subsequent public notice time extensions, but also during public hearings hosted by the RIDEM. The Corps attended a public hearing held by RIDEM on April 24, 2013 in the Town of Narragansett and another public hearing on May 8, 2013 in the Town of New Shoreham (Block Island). Comments expressed at the public hearings were similar to comments received by the Corps in comment letters during the public comment period, with comments both expressing support for the Project, particularly on Block Island, and opposition to the Project, particularly in Narragansett. Comments heard during the Narragansett public hearing expressed concerns regarding visual impacts on Block Island, potential damage to the Narragansett Town Beach from the cable crossing, financial motives of the project proponent, and general lack of trust about the Project and wind power. Comments heard during the Block Island public hearing mainly expressed support for the Project due to decreased energy costs for those living on the island. CRMC held public hearings on February 4, 2014, February 24, 2014, and February 27, 2014, which the Corps attended. Comments were similar to those expressed at the RIDEM public hearings and the responses received from the Corps public notices. It is unlikely that heretofore unknown issues would be identified in a Corps public hearing. A memo was signed by Colonel Barron on August 29, 2014 with the determination that a Corps public hearing was not needed because it was unlikely that new information would be obtained.

Additionally, the Applicants have provided opportunities for the public to directly engage DWBI and DWBIT in discussion about the Project. The Applicants invited the general public to a series of public outreach meetings during the period of January to March 2009. The public outreach meetings included discussions on the Project and monitoring equipment that would be deployed on Block Island, including a meteorological tower and other wind, bird, and bat monitoring equipment. Each of these meetings and their summaries were published in The Block Island Times. The Applicants also invited the general public to a series of open houses during the late spring and summer 2010 and 2011 when Block Island's seasonal population peaks. The meetings were held at public venues and community centers, including the Atlantic Inn, Spring House, Dead Eye Dick's, St. Andrew's Parish Center, and the Hotel Manisses. The Applicants also held meetings targeted towards specific interest

groups, including Real Estate Brokers on March 3, 2010 and the Chamber of Commerce and Tourism Council on September 27, 2010. In December 2011, the Applicants hosted an open house in Narragansett, Rhode Island that focused on the proposed mainland route for the BITS. The open house was advertised in the local and regional newspapers.

In accordance with 33 CFR 327.4, the Corps determined that it was not necessary to conduct a public hearing through the Corps public comment process because we have sufficient information to adequately evaluate the issues relating to the proposed activity.

f. **The following comments are not discussed further in this document as they are outside the Corps purview or are considered editorial commentary rather than substantive concerns.**

1. The project may impact the weather on Block Island.
2. Project will impact land quality for priority edible food sources. An increase in salt air on land will add to damp molds and spores.
3. The government funded project and permit process is a corrupt process.
4. It's totally counterproductive, exorbitant and ludicrous with no redeeming benefit and attempts to justify it have all been debunked, discredited and are fraudulent. It's a Rhode Island Boondoggle.

g. **Consideration and evaluation of comments.** The public concerns/comments referenced in Section 4.b are listed and addressed below and/or as noted in Section 7, Public Interest Review.

1. The wind turbine generators will have a detrimental impact on the view from Block Island.

   Response: Research and public attitude surveys have shown that WTGs are not necessarily considered an aesthetic liability by the viewing public even when clearly visible. However, in response to these concerns, DWBI submitted to the Corps a detailed Visual Impact Assessment (VIA) for the BIWF that included viewshed analyses and visual simulations and has designed the BIWF WTG Array and proposed mitigation measures to minimize visual effects to Block Island to the maximum extent possible. Based on the results of the VIA, the Corps has determined that the visual impacts are not unacceptable. Refer to Section 7.c for additional information.

2. Place the WTGs farther offshore to reduce impacts on viewshed and other factors such as noise and light.

   Response: Under state law, the BIWF WTG Array is required to be located in state territorial waters (see R.I. General Laws § 39-26.1-7(c) [outlining "the state's policy intention to facilitate the development of a small offshore wind project in Rhode Island waters"]). As dictated by the RI Ocean SAMP, DWBI was required to site the BIWF within the designated REZ. DWBI has proposed various measures to minimize visual effects of the WTGs, including impacts from lighting to the maximum extent possible. Specific measures include:

   - Locating the WTGs as far as possible offshore, while still remaining in state territorial waters and the REZ.

- Reducing the number of turbines from eight to five and installing the WTGs with a uniform design, speed, height, and rotor diameter.
- Utilizing a white or light grey color (less than 5 percent grey tone) for the WTGs to generally blend well with the sky and water and eliminate the need for daytime FAA warning lights or red paint marking of the blade tips.
- Consideration of the technical and financial feasibility of radar-controlled/aircraft-activated FAA lights to reduce nighttime visual impacts.

Refer to Section 7.c and 7.d for additional discussion of aesthetics, noise, and light.

3. Need a better alternatives analysis for siting the WTGs.

Response: DWBI was required to site the BIWF WTGs within the REZ established by the CRMC through the RI Ocean SAMP. DWBI conducted a detailed WTG Array alternative analysis that considered over four years of studies within the REZ, including extensive federal and state agency consultations and public outreach to select a location that minimizes impacts to the maximum extent possible. The proposed WTG Array results in the avoidance of significant, direct, and otherwise unavoidable impacts on important sea duck foraging habitat and important benthic habitat, specifically glacial moraine. In addition, according to a representative of Narragansett Tribal Historic Preservation Office (THPO), the proposed WTG Array also avoids the location of an important tribal area, Cautantowwit's house, which is located to the southwest of Block Island.

The Corps has reviewed the Applicants WTG Array alternative analysis and concurs that the preferred alternative represents the least environmental damaging practicable alternative. Refer also to Section 5 of this document for further detail on the alternatives analysis completed for both the BIWF and BITS marine and terrestrial facilities.

4. The power produced will cost Rhode Island ratepayers more than electricity that could be purchased on the open power market.

Response: Corps regulations direct that when private enterprise makes an application for a permit, it will generally be assumed that appropriate economic evaluations have been completed, the proposal is economically viable, and is needed in the market place (33 CFR 320.4(q)). In January 2010, the Rhode Island General Assembly amended R.I. Gen. Laws § 39-26.1-7 to establish the BIWF as a project in the public interest for the state of Rhode Island and authorized the costs of its associated PPA, subject to approval of the Rhode Island PUC. The PPA was submitted to the PUC for approval. In August 2010, following a public hearing, which included testimony, cross-examination and public comment, the PUC issued its Report and Order for Docket No. 4185 approving the PPA and finding that the PPA met the intent and requirements of R.I. Gen. Laws § 39-26.1-7 and, specifically, that the PPA was commercially reasonable as defined in such law. In July 2011, the Rhode Island Supreme Court affirmed the PUC's Order, finding that the PUC accurately interpreted R.I. Gen. Laws § 39-26.1-7 and properly applied such law by making findings that are lawful and reasonable, fairly and substantially supported by legal evidence, and sufficiently specific.

Refer also to Section 7.b for public interest review of economic benefits to the state of Rhode Island from the Project.

5. High costs to almost all Rhode Island ratepayers, but no benefits to Rhode Islanders except possibly to Block Island ratepayers.

   Response: Refer to Section 7.b for public interest review of economic benefits to the state of Rhode Island from the Project.

6. Electromagnetic fields (EMF) from the buried cable could impact marine life. At what depths will it be buried and what happens if it can't be placed at safe depths.

   Response: The BIWF Inter-Array and Export Cables and the BITS submarine cable will be buried to a target depth of 6 ft (1.8 m) beneath the seafloor. The Applicants have stated that the actual burial depth will depend on the substrate encountered along the route and could vary from 4 ft to 8 ft (1.2 m to 2.4 m). If less than 4 ft (1.2 m) burial is achieved, additional protection, such as concrete matting or rock piles, may be installed as shown on the typical drawings included in Appendix A to the October 2012 Public Notice. Where the BITS crosses two in-service cables, the BITS Cable will be installed directly on the seafloor and will be protected using a combination of sand bags and concrete mattresses. DWBIT has stated that the minimum depth of cover over the BITS Cable at these crossing locations will be 2 ft (0.6 m).

   The Applicants submitted a detailed EMF modeling analysis of the BIWF and BITS Cable routes with the BIWF/BITS ER. The results indicate that EMF from the cable design and burial depth will not impact marine life. EMF modeling for the proposed BIWF and BITS submarine cables was conservative and assumed no cable sheathing (which the cables will actually have), a maximum load on the cables, and a target burial depth of 6 ft. (1.8 m) beneath the seafloor. Even under these assumptions, EMF was determined to be below the 50 milli-Gauss (mG) theoretical detection level for magnetite-based marine species (e.g., mammals, turtles, fish, and invertebrates) and diminishes rapidly with distance from the cable (Normandeau et al. 2011).

   At locations where less than the target depth of burial is achieved, the model results, assuming 2 ft (0.6 m) of cover over the submarine cable, no cable sheathing, and maximum load on the cables, indicate that EMF will be highest (approximately 152.2 mG) directly over the cable at the surface of the protective armoring. EMF levels drop quickly to below 50 mG approximately 3.5 ft (1.1 m) on either side of the cable center line and 2 ft (0.6 m) above the armored surface. While EMF has the potential to be detectible where no more than 2 ft (0.6 m) of armoring is used, this represents a spatially limited area of less than 1 percent of the entire cable length. EMF diminishes rapidly with radial distance from the cable. As such, due to the limited distance of EMF from the source and small area of potential effect at sites where additional armoring may be used or where less than 4 ft (1.2 m) of cable burial depth is achieved, the Corps has concluded that EMF is not expected to be of sufficient range or strength to create a linear barrier to fish movement.

   Reference:
   Normandeau, Exponent, T. Tricas, and A. Gill. 2011. Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region, Camarillo, CA. OCS Study BOEMRE 2011-09.

7. How/where provide extra protection/armoring for cable. Will cable be left under ocean when project is complete? Have a plan and money to remove it.

Response: The Applicants have stated that protective armoring would be installed by an anchored vessel at the two proposed cable crossings and may be installed in those areas where less than 4 ft (1.2 m) of burial is achieved. The area where additional armoring may be required represents a maximum of approximately 1 percent of the BIWF and BITS marine cable routes. The Applicants have committed to meeting with jurisdictional agencies including the Corps, BOEM, NMFS, USCG, CRMC, RIDEM, and the CRMC Fisheries Liaison prior to the installation of additional armoring. The submarine BIWF cables will remain in place at decommissioning, as is standard industry practice, which will avoid the disruption to resources that would occur from removal. DWBIT proposes to operate the BITS in perpetuity. The submarine cables will not contain oil, and therefore, will not pose a risk of release to the environment.

8. Possible Deepwater bankruptcy? Who pays to remove the WTGs? Hurricanes could damage or destroy them. Prove they can withstand a hurricane.

Response:

Bankruptcy and WTG removal:

In accordance with the requirements of Chapter 8 of the RI Ocean SAMP, prior to construction, DWBI will provide an appropriate performance bond or other CRMC approved security to secure the obligation as assent holder to remove structures and to restore the site at the end of the term of the CRMC-issued Submerged Lands Lease.

Hurricanes:

DWBI has conducted extensive meteorological and oceanographic research within the BIWF Project Area to ensure that a long-term, worst-case environmental design basis is used for the BIWF. Based on these studies, technologies and turbines have been selected that are suited to the climatic conditions of the BIWF. The shortlisted BIWF WTG design specifications allow for maximum sustained winds of 112 miles per hour (mph) (50 meters per second [m/s]) and maximum wind gusts of 157 mph (70 m/s). This not only exceeds all historical site conditions and the statistically-generated "100-Year" storm, but also exceeds the worst storms experienced in the Northeast over the past 70 years, including the recent 2012 Superstorm Sandy.

The WTGs themselves have internal controls to ensure safety and survivability during large storms. When wind speeds reach 67 mph (30 m/s) or more, the WTGs will stop producing power, the blades will automatically pitch to minimize drag, and the hub will rotate to face into the wind. Each WTG will include a battery backup to provide communications in case of a power outage and to control the pitch of the blades and the direction of the hub.

The WTGs will sit atop jacket type foundations, which will be designed in accordance with the latest international and American codes and standards. Specifically, the American Bureau of Shipping (ABS) Guide for Building and Classing Bottom Founded Offshore Wind Turbine Installations (edition January 2013) will be applied for the design of the wind farm. Superstorm Sandy and 1991's Hurricane Bob and Perfect Storm events had maximum wave heights between 30 ft and 35 ft (9.1 m and 10.7 m). The design criteria for the foundations will result in design waves well above these wave heights.

Additionally, through the review and approval process required by the CRMC, design criteria will be verified by an independent, certified verification agent to ensure that the WTGs and foundations are designed to meet appropriate standards and that they will

resume power production when wind and sea conditions return to safe operating conditions.

9. Deepwater must have a fund to cover eventual decommissioning costs after the useful life of the WTGs.

   Response: In accordance with the requirements of Chapter 8 of the RI Ocean SAMP, prior to construction, DWBI will provide an appropriate performance bond or other CRMC-approved security to secure the obligation as assent holder to remove structures and to restore the site at the end of the term of the CRMC-issued Submerged Lands Lease.

10. Impacts to property values.

    Response: There may be an impact but it is difficult to quantify or to know how long an impact could last. DWBI has submitted evidence showing little or no impact on properties adjacent to upland wind farms. A U.S. Government-funded study published in 2003 entitled "The Effect of Wind Development on Local Property Values" examined 25,000 real estate transactions within 5 mi (8.0 km) of 10 of the larger wind farms built in the United States between 1998 and 2001. The study found no adverse effect to nearby property values caused by views of WTGs. Similarly, in 2006 a study entitled "Impacts of Windmill Visibility on Property Values in Madison County, New York" found no negative impact on real estate values from a wind farm there.

    Thus, because there is no evidence of loss to property values caused by the visual impact of BIWF, the Corps does not anticipate that the Project would significantly affect property values.

11. Noise pollution and light pollution from the WTGs.

    Response: The WTGs will be lit and marked in accordance with FAA and USCG requirements for aviation and navigation obstruction lighting. Refer to Section 7.c for further discussion of nighttime simulations and measures taken by the DWBI to avoid and minimize impacts from WTG lighting. Refer to Section 7.d for a discussion of noise impacts.

12. Navigation dangers to boats in the area. Hazard to navigation especially during foggy weather.

    Response: Refer to Section 7.k, Navigation.

13. Dangers to small planes flying in the vicinity.

    Response: Refer to Section 7.k, Navigation.

14. Project will impair the views from the Southeast Lighthouse, which is a National Historic Landmark. It will also adversely affect National Register listed sites on Block Island.

    Response: Refer to Section 7.f, Historic Properties.

15. Impacts to bird populations, marine mammals and overall ecology.

    Response: Refer to Section 7g, Fish and Wildlife Values.

16. Underwater noise impacts on marine life.

Response: The Applicants submitted an underwater acoustic analysis with the BIWF/BITS ER. The analysis supported the evaluation of noise impacts on marine life and was submitted as part of the Biological Assessment to NMFS for review. NMFS concluded in their Biological Opinion that the proposed Project may adversely affect but is not likely to jeopardize the continued existence of ESA-listed North Atlantic right, humpback, or fin whales or any distinct population segments of Atlantic sturgeon. The Biological Opinion also includes an incidental take exemption for loggerhead, leather back, Kemp's ridley, and green sea turtles, as well as the Atlantic sturgeon due to exposure to disturbing levels of noise due to impact pile driving.

Additionally, on March 11, 2013, DWBI and DWBIT each submitted individual requests to NMFS for Incidental Harassment Authorizations (IHA) for the BIWF and BITS, respectively. Through this request, the Applicants will work with NMFS to develop the mitigation and monitoring strategy for construction-related acoustic impacts. NMFS has indicated that they will amend the Biological Opinion to include the incidental take exception for the ESA-listed North Atlantic right, humpback, or fin whales following the issuance of the IHAs. Refer also to Section 7g, Fish and Wildlife Values.

17. Post-construction monitoring is needed to document impacts on marine life and birds.

Response: DWBI has committed to conduct the following construction and post-construction monitoring to determine potential effects from the BIWF:

- Demersal fish surveys (Trawl Surveys) (2 years pre-construction and 3 years post-construction)
- Lobster surveys (2 years pre-construction, 1 year during construction, 1 year post-construction)
- Beached bird surveys (1 year pre-construction and 2 years post-construction)
- Avian and bat surveys including:
  - bat acoustic monitoring during construction
  - ship-based bird monitoring (2 years during operation)
  - nocturnal migrant collision monitoring (3 non-consecutive years during operation)
  - avian radar monitoring (3 non-consecutive years during operation)

18. Spinning turbine blades could kill many birds/bats.

Response: DWBI conducted a comprehensive 3-year, site-specific pre-construction avian and bat survey to support the siting, construction, and operation of the BIWF WTGs. Results of this multi-year study were submitted to the Corps with the permit application and were provided to the USFWS, CRMC, and the RIDEM Division of Fish and Wildlife for review and consultation. Refer to Section 7.g and 8.a for agency determinations.

DWBI has incorporated a number of measures into the design of the BIWF to avoid and/or further minimize the potential collision impacts to avian species:

- DWBI decreased the number of proposed WTGs from eight 3.6-MW turbines to five 6-MW turbines.

- The WTG Array has been sited away from areas known to concentrate birds, such as coastal shallow areas and mudflats.
- The use of flashing red FAA lights (rather than white) on each WTG reduces the potential for the WTGs to act as an attractant to migrant avian species.
- The WTG foundation design incorporates anti-perching devices and design measures to avoid attracting avifauna, thereby reducing the potential for collisions with habituated birds that may occur in the area of the WTG Array.

19. May impact endangered marine mammals like Northern Atlantic right whale. Mitigation measures to reduce risk such as collisions or noise impacts.

Response: The Applicants have taken a number of measures to avoid impacts on marine mammals, such as proposing a construction schedule that mitigates impacts on the North Atlantic right whale. The Applicants have also conducted detailed underwater acoustic assessments under both worst and base-case construction and operational conditions to support the development of appropriate mitigation and monitoring strategies and has submitted requests for IHAs and Incidental Take Statements (ITS) to NMFS, which contain mitigations and best practices to minimize the potential for impacts on marine mammals. Refer to Section 7.g, Fish and Wildlife Values.

20. Project compatibility and coordination with fishing and other marine uses.

Response: The WTG Array has been located within the REZ that was identified as a result of the RI Ocean SAMP and which included input from a number of stakeholders, including fishing and other users of the marine environment around Block Island. The CRMC chose the REZ as a site that minimizes the potential impact on natural resources (benthic ecology, birds, marine mammals, sea turtles, fisheries resources, and habitat) and existing human uses (commercial and recreational fishing, cultural and historic sites, recreation and tourism, marine transportation, navigation and infrastructure).

Additionally, the Applicants have been engaging in ongoing stakeholder outreach with various marine stakeholders, including the commercial and recreational fishing industry. The Applicants have committed to the following measures to minimize impacts on marine users and to support both compatibility and coordination:

- The Applicants do not propose any operational phase vessel exclusions around the WTGs or other areas of the Project.
- Cables will be buried at a target depth of 6 ft (1.8 m) below the seafloor to avoid interactions with fishing gear and/or anchors.
- The Applicants will implement a comprehensive communication plan during construction to inform commercial and recreational fishermen, mariners, and recreational boaters of construction activities and vessel movements. Communication will be facilitated through a Project website, public notices to mariners and vessel float plans, and the CRMC Fishery Liaison.
- The Applicants will submit information to the USCG to issue LNMs during offshore installation activities.
- The Applicants have established designated construction vessel traffic routes, construction standby areas, and Work Areas.

- WTGs will be marked and lit with both USCG and FAA-approved navigational aids. A sound signal will be installed on the WTG located in the center of the Array.
- The Applicants began funding a liaison to facilitate communication with the fishing industry in 2012.
- The Applicants will provide mariner information sheets on its website with details on location of Project facilities and specifics such as blade clearance above sea level.

Refer also to Section 7.j, Land Use: Marine Uses.

21. Project construction will impact tourism and recreation.

Response: Refer to Section 7.b and Section 7.m.

22. Build a stand-alone cable and the WTGs aren't needed.

Response: The purpose of the BIWF is to respond to the state of Rhode Island's expressed need for renewable energy as established by the RIWINDS, codified by Rhode Island law (RIGL §§ 39-26-1 et seq and 39-26.1-7), and as defined by the JDA. A stand-alone cable would not satisfy such purpose. It would also be expensive and no entity has committed to installing a stand-alone cable.

23. Cable crossings at Crescent Beach on Block Island and Narragansett Town Beach could impact beaches and public safety.

Response: The submarine cable is armored with metal sheathing and installed in a conduit, and as such, the Corps does not expect it to have an impact on beaches or public safety. Many beaches have cables underneath them without problems. Additionally, DWBIT has relocated the cable landfall on the mainland from Narragansett Town Beach to Scarborough State Beach. The cable will be buried beneath the less active recreational part of the beach currently used for utility purposes (stormwater outflow).

24. No Environmental Impact Statement (EIS) done so the true impacts aren't known. Do an EIS.

Response: Extensive research has been performed by the state of Rhode Island in support of the RI Ocean SAMP to identify and designate the preferred location for the REZ based on careful consideration of the types of impacts anticipated from offshore wind energy projects. In addition, the Applicants have completed a robust suite of site-specific surveys, agency consultation, and stakeholder outreach to further refine the location and design of the BIWF within the REZ and the BITS. The Applicants submitted the results of these studies in a comprehensive report (BIWF/BITS ER) accompanying the permit applications to support the environmental review of the Project under the NEPA, as well as the environmental analysis required as part of other federal, state, and local approvals and consultations for the Project. The Corps, as Lead Federal Agency, working with BOEM as a Cooperating Agency, has reviewed the submitted reports and consulted with federal and state resource agencies to evaluate potential impacts on environmental resources resulting from the Project. Based on this review, the Corps has determined that an EA is sufficient to evaluate potential impacts and to satisfy the requirements of NEPA. Refer to Section 11 for the agency determinations and Statement of Findings.

25. Project will destroy the pristine tranquility of an unspoiled area.

Response: The BIWF is proposed to be located within the REZ established through the RI Ocean SAMP, which considered the several existing uses of the marine environment off of the Rhode Island coast. Refer to Section 7.j for a discussion of existing marine uses.

26. Cumulative impacts. What about other future wind farms or additional WTGs in the same REZ.

Response: As stated previously, the purpose of the BIWF is to respond to the state of Rhode Island's expressed need for renewable energy as established by the RIWINDS, codified by Rhode Island law (RIGL §§ 39-26-1 et seq and 39-26.1-7). Rhode Island law limits the nameplate capacity of the Project in the REZ to no more than 30 MW. Therefore, it is not possible for DWBI to expand the BIWF. No additional offshore wind projects have been proposed for the REZ.

27. Maintenance and repair of WTGs and cable could cause environmental effects. Damaged WTGs could leak oils and lubricants into the marine environment.

Response: DWBI has stated that the WTGs will require approximately 3 to 5 days of planned maintenance per year. The jacket foundations will be inspected annually. WTG maintenance will be conducted from a standard vessel and is not expected to interfere with marine uses or result in impacts on the environment. The Applicants have further stated that the BIWF Inter-Array Cable and submarine portions of the Export Cable and the BITS Cable have no maintenance needs unless a fault or failure occurs. These cable routes will be inspected using a sub-bottom profiler at least once every five years. As standard practice, maintenance vessels will operate in compliance with oil spill prevention and response plans that meet USCG requirements. While the WTGs will not contain significant amounts of lubricating oil or other materials that may affect water quality if released into the marine environment, DWBI will maintain a Project-specific Spill Prevention and Response Plan to address the limited, low quantity of such materials.

28. General damage to the water quality from the Project.

Response: Refer to Section 7.o.

29. Deepwater Wind will make too much money at the expense of the Rhode Island electric ratepayers.

Response: Refer to Section 7.b for a discussion of economic benefits to the state of Rhode Island from the Project.

30. Terrestrial and marine archaeology. All the excavating could destroy important archaeological sites and cultural resources.

Response: Refer to Section 7.f.

31. Anchor chains from barges and work boats dragging on the bottom can destroy benthic habitat and damage fisheries.

Response: The impacts from anchoring will be temporary, limited in spatial extent and minor. In terms of avoidance, the Applicants have sited the Project to avoid important hard bottom benthic habitats to the maximum extent possible. Refer also to Section 7.g, Fish and Wildlife Values.

5. ALTERNATIVES ANALYSIS

The analysis of alternatives is an important requirement of both NEPA and EPA's 404(b) Guidelines, 40 CFR Part 230. However, there is an important distinction between the alternatives analysis under each legal framework. NEPA is a procedural statute, and the alternatives analysis under NEPA is a procedural requirement that does not mandate a substantive result. Unlike NEPA, however, the alternatives analysis of Section 404 does serve a substantive role in several ways, most notably in the identification of the least environmentally damaging practicable alternative (LEDPA), 40 CFR § 230.10(a). Here, the Corps regulates the majority of the proposed Project under Section 10 of the Rivers and Harbors Act of 1899, and a smaller piece of the Project under Section 404 of the Clean Water Act. As such, the NEPA analysis—and its consideration of alternatives—must address the entire Project, but the 404(b) alternatives analysis is much more narrow because the 404 fill associated with the Project is limited to armoring at each of the WTG foundations, armoring in certain areas along the submarine transmission route, and the landfall of the BIWF and BITS Cables at Crescent Beach on Block Island. As such, the 404(b) and LEDPA analysis focuses only on alternatives to the fill associated with these regulated activities, not the entire Project. This is consistent with the 404(b) Guidelines, which contemplate situations where "NEPA documents may address a broader range of alternatives than required to be considered under" the 404(b) alternatives analysis. 40 CFR § 230.10(a)(4).

Applicants' Preferred Alternative Site and Site Configuration

The Applicants' preferred site and site configuration for the BIWF and BITS is as described in Section 1 and depicted on Figures 1 through 3, Figure 5, and Figure 7. This configuration was selected based on several years of environmental studies, agency consultation, stakeholder outreach, and the requirements of the RI Ocean SAMP.

Off-Site Locations

The Applicants have evaluated alternative off-site locations for locating the BIWF and BITS facilities. Each of the alternatives evaluated are discussed below.

1. WTG Array Alternative Locations. The policy of the state of Rhode Island, principally the RI Ocean SAMP, dictated the viable alternative locations for the WTG Array. Through the RI Ocean SAMP process, the state of Rhode Island evaluated existing environmental conditions and marine uses to designate an area for renewable energy development within state territorial waters that would minimize the potential impact on natural resources (benthic ecology, birds, marine mammals, sea turtles, fisheries resources, and habitat) and existing human uses (commercial and recreational fishing, cultural and historic sites, recreation and tourism, marine transportation, navigation, and infrastructure). This designated area is referred to as the "Renewable Energy Zone" or REZ. Given the requirement for the Project to be located within the REZ established by the RI Ocean SAMP and within state waters of Rhode Island, all potential locations for the proposed WTG Array outside of the REZ are not feasible. Refer to Section 5.c.1 and Figure 8 for discussion of alternative WTG Array configurations within the REZ.

2. BIWF Collection System Alternatives. The BIWF Collection System comprises the following components: submarine Inter-Array Cable, submarine and terrestrial Export Cable, and BIWF Generation Switchyard (part of the Block Island Substation). The location of the Inter-Array Cable is dictated by the location of both the WTG Array and WTG configuration, which are detailed further in this section (refer to discussion in Section 5.b.1 and 5.c.1). The BIPCO property represents the only electrical distribution facility on Block Island to which the Project could interconnect, and therefore the preferred location where the BIWF Generation Switchyard could be located (refer to

discussion in Section 5.c.2 for on-site configurations for the BIWF Generation Switchyard).

i. Submarine Export Cable Alternatives. DWBI identified viable locations for the submarine portion of the Export Cable and its associated landing locations by completing a series of analysis beginning with a detailed desktop analysis that identified generally viable areas. Next, a screening level field survey was completed. Based on the results of this analysis, a preferred route corridor was identified and was subject to thorough marine route surveys. DWBI further applied the following environmental and engineering/construction routing criteria for evaluating alternative routes for the Export Cable:

- Minimize the total length of Export Cable including:
  - reducing the total length of the marine cable route to minimize impacts on the surrounding marine environment; and
  - selecting a shore landing location that allows for minimal impact and minimal terrestrial distance to the Block Island Substation;
- Avoid impacting sensitive biological habitat (e.g., eelgrass) and cultural marine resource sites (pre- and post-contact);
- Avoid hard substrates (e.g., cobble, boulders, bedrock) that could adversely affect power costs and make use of the jet plow infeasible or increase the duration and impact of cable installation;
- Minimize impact on existing marine uses (e.g., vessel traffic lanes); and
- Select a site that will minimize impacts to other sensitive environmental receptors in surrounding area.

To identify potential landfall locations for the Export Cable on Block Island, DWBI considered the following:

- Avoidance or minimization of disturbance to sensitive coastal areas, habitat, and resources (e.g., eelgrass, beach dunes);
- Avoidance of hard substrates (e.g., cobble, boulders, bedrock) that could adversely affect power costs and make use of the jet plow infeasible or increase the duration and impact of cable installation;
- Availability of a cable shore landing location with sufficient construction workspace; and
- Avoidance or minimization of impacts on the local community on Block Island.

Using these criteria, DWBI identified three potential Export Cable Alternatives from the northernmost WTG to three potential landing locations on Block Island (Figure 9). Each of the three alternatives (Export Cable Alternatives 1, 2 and 3) is located on the eastern side of Block Island, near Old Harbor. Given the preferred location of the WTG Array to the southeast of the island (refer to discussion in Section 5.c.1) and the Block Island Substation on the BIPCO property (refer to discussion in Section 5.c.2), any other landfall location would have resulted in a longer cable route, which would increase impacts and cost-effectiveness.

Each of the three alternatives identified by DWBI was considered comparable in the following ways:

- The submarine portions of the cable are not significantly different in length and would therefore not result in a substantial difference in Project cost.
- Each alternative landfall location allows for a short terrestrial cable route installation to the preferred Block Island Substation.
- The geophysical conditions along the alternative routes and on the eastern side of Block Island are conducive to employing environmentally preferable construction methodologies, including both jet plow and HDD.

Despite these advantages, Export Cable Alternative 2 would result in the direct impact of a confirmed eelgrass bed that provides important habitat for marine species. Export Cable Alternative 3 would result in a number of advantages over Export Cable Alternative 1. Specifically, the proposed landing location for Export Cable Alternative 3 would be on publicly owned land, which would avoid impacts on private property. Alternative 3 also occurs in softer substrate material that facilitates the environmentally preferable shore landing by jet plow and HDD. The proposed landfall location also meets the spatial needs of HDD and jet plow construction activities without impacting sensitive environmental features on Block Island (e.g., beach dunes) and offers sufficient space for additional construction staging, minimizes the need for additional construction staging locations on Block Island, and improves the cost-effectiveness of the Project. Lastly, the Alternative 3 shore landing allows for a marine cable route alignment that avoids impacts on offshore sensitive environmental features (e.g., eelgrass).

For these reasons, Export Cable Alternative 3 is the preferred alternative.

ii. Terrestrial Export Cable Alternatives. DWBI identified viable off-site locations for the terrestrial portion of the Export Cable using the following environmental and engineering/construction routing criteria for evaluating the alternatives:

- Minimize the distance between the preferred landfall location and the preferred substation location.
- Maximize the use of existing rights-of-way to avoid and/or minimize potential impacts on existing utilities, infrastructure, vegetation and the local community.
- Avoid or minimize potential impacts on environmental, archaeological, and cultural resources.

Based on these criteria, DWBI identified two viable Export Cable terrestrial route alignments on Block Island to the BIPCO property (Figure 9). Terrestrial Alignment 1 runs south from the preferred landfall location within an existing right-of-way on Corn Neck Road, turns west along the existing right-of-way on Beach Avenue, and then turns southeast onto an existing access road to the BIPCO property. Terrestrial Alignment 2 follows existing rights-of-way from the preferred landfall location south along Corn Neck Road, west on Beach Avenue, and turns south onto Ocean Avenue within an existing right-of-way, before turning southwest onto an existing access road to the BIPCO property.

An evaluation of the two alternative alignments found them both comparable in linear distance and use of existing right-of-way. However, Terrestrial Alignment 1 offers a distinct advantage over Terrestrial Alignment 2 by avoiding historic underground contamination that extends north from the BIPCO property under Ocean Avenue.

For these reasons, Terrestrial Alignment 1 is the preferred alternative.

iii. BIWF Generation Switchyard Alternatives. See discussion in Section 5.c.2.

3. BITS Alternatives. The BITS comprises the following components: submarine and terrestrial cable; the BITS Island Switchyard (part of the Block Island Substation); and the Rhode Island mainland switchyard. Because the BITS facilities on Block Island will be collocated with the BIWF facilities along the terrestrial cable route and at the Block Island Substation, the alternatives analysis for the BITS on Block Island was encompassed within the analysis for the BIWF (see Section 5.b.2.ii).

   i. BITS Mainland Interconnection Alternatives. In 2007, BIPCO completed an Electric Resource Planning Study that included an economic analysis of new supply and demand-side management options for BIPCO (HDR 2007). One of the new supply options considered by this analysis was a submarine cable connecting Block Island to the mainland. The study, which did not contain engineering details, identified two potential routes and points of interconnection owned by TNEC at:

      - Langworthy Substation near Westerly, Rhode Island (Langworthy Alternative)
      - Wood River Substation near Wood River Junction, Rhode Island (Wood River Alternative)

   Based on the BIPCO Study, the Langworthy Alternative results in a 14.5-mi (23.3-km) submarine cable route from Block Island to a landing location on the Rhode Island mainland near the Weekapaug Breachway and a 2-mi (3.2-km) terrestrial cable to make the final connection to the existing Langworthy Substation.

   The Wood River Alternative results in a 13.3-mi (21.4-km) submarine cable route from Block Island to a landing location on the Rhode Island mainland near Quonochontany Pond and a 9.5-mi (15.3-km) terrestrial cable route to make the final connection to the existing Wood River Substation.

   In 2009, the DWBIT conducted a preliminary engineering and environmental analysis to identify one or more viable points of interconnection with the existing TNEC distribution system on the Rhode Island mainland, including a detailed review of the 2007 BIPCO study (HDR 2007). Preliminary analysis conducted by the DWBIT regarding these potential interconnection alternatives indicated that both interconnection alternatives would be cost prohibitive due to environmental factors, including an area of cobble-gravel pavement extending up to 2 mi offshore that coincides with high quality benthic phase lobster habitat; the presence of submerged aquatic vegetation that substantially limited the viable options for cable landfall; the presence of ecologically sensitive salt pond areas near the shore; terrestrial routes that would traverse both densely populated areas and areas of high sensitivity for traditional cultural properties, and the need for significant facility upgrades required to support the additional power produced by the BIWF. As a result, the DWBIT

conducted further analyses in coordination with TNEC from 2009 through 2012. Results of this coordination and analysis identified three potential points of interconnection that could successfully accept power from the BIWF (Figure 10). These locations included the following:

- Interconnection with TNEC's Feeder 3307 at the end of Albro Lane in South Kingston, Rhode Island (Albro Lane Alternative).
- Interconnection with TNEC's Feeder 3302 near the Narragansett Department of Public Works (DPW) maintenance facility in Narragansett, Rhode Island (Narragansett Alternative).
- Interconnection with TNEC's existing Bonnet Substation in Narragansett, Rhode Island (Bonnet Alternative).

The Albro Lane Alternative would require constructing a new switchyard—the Albro Lane Switchyard—on private property in South Kingston, Rhode Island, proximate to TNEC's existing 3307 right-of-way and other existing commercial uses. Interconnecting with Feeder 3307 would not require any material system upgrades. The Albro Lane Alternative would require a combination of overhead and buried cable along existing and private rights-of-way for a distance of 2.1 mi (3.4 km), including crossing of a major road–Route 1 resulting in both cost and engineering challenges.

The Narragansett Alternative would require construction of a new switchyard—the Narragansett Switchyard—on public property in Narragansett, Rhode Island, proximate to TNEC's existing 3302 right-of-way and the Narragansett DPW garage. Interconnecting with Feeder 3302 would require replacing approximately 1 mi (1.6 km) of the existing Feeder 3302 between the new Narragansett Switchyard and the existing Wakefield Substation with new overhead wire in the same location as the existing wire. Additionally, interconnection with Feeder 3302 is expected to require certain protection upgrades at the Wakefield Substation.

The Bonnet Alternative would include the expansion of the existing TNEC Bonnet Substation near the URI Bay Campus in Narragansett, Rhode Island. Interconnecting at the Bonnet Substation would require replacing approximately 9 mi (14.5 km) of the existing Feeder 3302 between the existing Bonnet Substation and the existing Wakefield Substation in South Kingston, Rhode Island with new overhead wire in the same location as the existing wire. Additionally, interconnection at the Bonnet Substation would require certain protection upgrades at the Wakefield and Bonnet Substations.

Consideration of these alternatives eliminated the Albro Lane Alternative as not practicable due to inability to secure property access to the site. Based on site-specific studies for the remaining alternatives, DWBIT determined that both the Narragansett and Bonnet Alternatives would be feasible for development because of their location close to the proposed TNEC point-of-interconnection, proximity to shore, and compatible surrounding land uses. However, the Narragansett Alternative was found to be more attractive than the Bonnet Alternative for the following reasons:

- the Bonnet Alternative is a longer and more expensive submarine cable route;

- the Bonnet Alternative is technically a more complicated landfall, and therefore more costly; and
- upgrade of Feeder 3302 will be expensive and has potential adverse environmental impacts to both wetlands and residences.

Subsequent to this analysis and filing of the BITS permit application, DWBIT, in response to public and agency concerns related to the Narragansett Alternative, identified another alternative terrestrial cable route associated with the Scarborough State Beach landing (Scarborough Beach Alternative) for the BITS to interconnect directly with the existing Wakefield Substation rather than at Feeder 3302 (Figure 10). Interconnection directly with the existing Wakefield Substation will involve (1) the removal of an existing capacitor bank currently located in the Wakefield Substation; (2) the installation of a replacement capacitor bank in the Dillon's Corner Switchyard; and (3) the installation of a new circuit breaker and bus connector riser in the Wakefield Substation in the area currently occupied by the capacitor bank. Connecting directly at the Wakefield Substation via the Scarborough Beach Alternative route allows for a buried cable entirely within state-owned rights-of-way that does not result in wetland disturbance and does not result in changes to the overall visual character of the existing substation.

For these reasons, the direct interconnection at the existing Wakefield Substation associated with the Scarborough Beach Alternative is the preferred Alternative.

Reference:

HDR. 2007. Electric Resource Planning Study, prepared by HDR Engineering, Inc. for the Block Island Power Company, New Shoreham, Rhode Island, September.

ii. BITS Submarine Cable Route Alternatives. DWBIT applied the same environmental and engineering/construction routing criteria that were used in evaluating the alternative routes for the Export Cable (see Section 5. b.2.i). Based upon these selection criteria and in response to public and agency comments on the proposed Project, DWBIT identified six potential submarine cable alignments from Block Island to the Rhode Island mainland (Figure 11). These alternatives include the following:

- BITS Alternative 1 runs northeasterly from the preferred Block Island landing location before turning north and terminating at the preferred landfall location in Narragansett, Rhode Island near the Narragansett Town Beach. The total length of BITS Alternative 1 is approximately 23.9 mi (38.5 km).
- BITS Alternative 2 would follow the same route as the BITS Alternative 1 route from Block Island to the area west of Point Judith, Rhode Island, where the BITS Alternative 2 would proceed farther north toward the URI Bay Campus. The total length of BITS Alternative 2 is approximately 25.9 mi (41.7 km).
- BITS Alternative 3 runs northeasterly from Old Harbor before turning north and then northwest and terminating at the preferred landfall location in Narragansett, Rhode Island. The total length is 20.6 mi (33.1 km).

- BITS Alternative 4 runs northeasterly from Old Harbor, to the west of Alternative 2 before turning north and then northwest and terminating at the preferred landfall location in Narragansett, Rhode Island. The total length is 18.9 mi (30.4 km).

- BITS Alternative 5 follows the path of Alignment 1 when it leaves Old Harbor. Alternative 5 leaves the path of Alternative 1 when it turns to the northeast to circumvent an area of rocky substrate–Point Judith shoal that extends southward from Point Judith. The path then turns north and then northwest before terminating the preferred landfall location in Narragansett, Rhode Island. The total length is 20.9 mi (33.6 km).

- BITS Scarborough Beach Alternative follows the same route from Block Island through state and federal waters as BITS Alternative 1 up to a point approximately 17.4 mi (28 km) from the shore landing on Block Island. At this point, the Scarborough Beach Alternative cable corridor diverges to the west from the BITS Alternative 1 route and traverses state submerged lands for a distance of approximately 2.4 mi (3.9 km) to make landfall beneath Scarborough State Beach. The total length is 25.1 mi (40.4 km).

Based on the detailed site-specific sediment profile imaging survey conducted by DWBIT along the proposed cable routes in the fall of 2009, BITS Alternatives 3 and 4 were found to pass through an area with hard substrates. These harder substrates presented an engineering challenge, potentially limiting the burial depth of the cable and the potential use of the environmentally preferred jet plow to install the cable, which would collectively result in increased installation costs and environmental effects. In addition, hard bottom substrates are considered important habitat for fish and other marine species. Based on the criteria to avoid these substrates to the extent practicable for these reasons, Alternatives 3 and 4 were eliminated from further consideration.

BITS Alternatives 1, 2, and 5 were found to be comparable in both technical feasibility and environmental impacts; however, BITS Alternative 5 would cross into the Traffic Separation Zone that coincides with the Torpedo Testing Area. Alternative 5 was eliminated from further consideration to avoid siting the BITS submarine cable within the Torpedo Testing Area.

DWBIT conducted additional site-specific geophysical and geotechnical, marine benthic and marine archaeological investigations along BITS Alternatives 1 and 2 in the fall 2011/winter 2012. Based on the route selection criteria and the results of the site-specific environmental and engineering surveys, although feasible, DWBIT determined that BITS Alternative 2 would be technically more complicated and costly due to a longer submarine cable route and a steep embankment near the landfall location, which would have prevented a cost-effective cable landing. In addition, the proposed BITS Alternative 2 landfall location would occur in proximity to a known historic eelgrass bed, which would require additional survey and protection/avoidance measures prior to construction. Onshore, the BITS Alternative 2 would also require additional upgrades to connect with TNEC's existing Bonnet Substation.

For these reasons, DWBIT initially determined BITS Alternative 1 to be the Preferred Alternative. Subsequent to submitting the permit application, the DWBIT submitted a modification to introduce the Scarborough Beach Alternative in response to public and agency comments. The Scarborough Beach Alternative provides the same advantages

as the BITS Alternative 1 where they coincide up to a point approximately 17.4 mi (28 km) from Block Island. However, the Scarborough Beach Alternative also allows for a shorter marine cable route, thereby reducing the potential impacts for marine resources, and instead, utilizes a longer terrestrial route on well-developed state roads.

For these reasons, the BITS Scarborough Beach Alternative is the Preferred Alternative.

iii. BITS Mainland Landfall Alternatives. DWBIT initially evaluated several potential landing locations on the Rhode Island mainland for BITS Alternative 1 in the vicinity of Narragansett Town Beach. The prospective landfall locations were evaluated using the same screening criteria to identify the potential landfall locations for the Export Cable on Block Island (Section 5. b.2.i). Based upon these criteria, DWBIT identified three potential landfall locations for the BITS Cable in Narragansett (Figure 12).

Mainland Landfall Alternative 1 would bring the BITS Cable ashore on state-owned land at State Pier #5. Mainland Landfall Alternative 2 would bring the cable to shore on town-owned land at Gazebo Park, and Mainland Landfall Alternative 3 would result in the BITS Cable coming to shore in the parking lot of Narragansett Town Beach.

Evaluation of Mainland Landfall Alternative 1 revealed several disadvantages. Namely, this alternative would land the BITS Cable at a rock pier. This alternative landing location is in an area comprising large gravel, boulders, and exposed bedrock which is high-quality benthic habitat. The presence of the high-quality benthic habitat and the bedrock in the area would necessitate the use of HDD to bring the cable ashore. There is insufficient workspace onshore to support the necessary HDD construction equipment and therefore this alternative is not viable.

Evaluation of Mainland Landfall Alternative 2 revealed that the area contains large gravel, boulders, and exposed bedrock, which is high-quality benthic habitat. Although physical space for an HDD construction workspace would be available, the lack of as-built drawings for the seawall construction at this landfall location and the requirement to drill through bedrock under the seawall would add both significant time to the construction schedule and cost. The only other alternative landing methodology would be the use of a rock saw that would cut through the gravel, boulders, and bedrock, resulting in disturbance to the high-quality benthic habitat and sedimentation in the water column. Additionally, Mainland Landfall Alternative 2 is located proximate to a number of new housing units, which might be disturbed.

In contrast to Mainland Landfall Alternatives 1 and 2, Mainland Landfall Alternative 3 offered a number of advantages. Specifically, Mainland Landfall Alternative 3 would be located on publicly owned land. The BITS Cable route to this landfall location is through predominantly soft sandy substrate making the use of both the HDD and jet plow methodologies technically feasible and cost-effective. The soft sandy substrate is not considered to be of special benthic value. In addition, the proposed landfall location meets the spatial needs of HDD construction activities and offers sufficient space for additional construction staging.

Subsequent to filing the application, BITS Mainland Landfall Alternative 3 was deemed to be impracticable due to public and agency concerns. In response to these

concerns, DWBIT identified the Scarborough Beach Alternative for the cable landfall beneath Scarborough State Beach (Figure 5). The Scarborough Beach Alternative cable landing offered several advantages to the BITS Mainland Landfall Alternative 3 at Narragansett Town Beach, including the following:

- Provides for cable landfall on a state beach that currently supports public utility infrastructure (i.e., stormwater outflow facilities) on an area of the beach that is outside of the guarded swimming area;
- Provides for cable landfall on a state beach that does not contain sand dunes or other sensitive environmental areas that are present at other alternative beach landing locations; and
- Provides the option for a direct installation method, which will shorten installation time and minimize construction noise.

For these reasons, the Scarborough Beach Alternative is the Preferred Alternative.

iii. BITS Island Switchyard Alternatives. See discussion in Section 5.c.2.

On-Site Configurations

DWBI evaluated the following on-site Project facility configurations: alternative locations of the WTG within the REZ; alternative locations of the Block Island Substation within the BIPCO property; alternative WTG and foundation technologies.

1. WTG Array Alternatives. As stated above, DWBI was required to site the BIWF WTG Array within the REZ; however, they did evaluate potential locations for the WTG Array within the REZ based on a variety of factors. Specifically, the following BIWF-specific siting criteria were applied by DWBI to identify a location of the WTG Array that would both minimize environmental impacts and ensure the economic and technical feasibility of the Project:

   - Avoid hard substrates (e.g., cobble, boulders, bedrock) that could adversely affect cost and feasibility.
   - Locate the WTGs in areas of the greatest wind energy potential with a minimum spacing of not less than 5 rotor-diameters (approximately 0.5 mi [805 m]) to maximize productivity and cost-effectiveness to enable the BIWF to maximize the "Wind Outperformance Adjustment Credit" provided for in the PPA, which benefits Rhode Island ratepayers.
   - Locate the WTGs as far as possible from shore while still remaining with the state waters and the REZ to minimize potential visual impact to the maximum extent possible.
   - Avoid the crossing of navigation features such as vessel traffic lanes, ferry routes, and boat racing routes to minimize potential impacts on marine uses.
   - Avoid important marine habitats including hard bottom complexes (e.g., cobble, boulders) to minimize potential impacts on marine species.
   - Avoid avian migration routes and foraging areas to minimize potential impact on avian species.

- Avoid cultural marine resource sites (pre-contact and post-contact).

These criteria were then evaluated against applicable federal and state guidance, agency consultation, and public outreach. Based upon the results of this analysis, DWBI identified two potential WTG Array locations within the REZ. WTG Array Alternative 1, located approximately 3 mi (4.8 km) southwest of Block Island; and WTG Array Alternative 2 located approximately 3 mi (4.8 km) southeast of Block Island (Figure 8).

Both WTG Array Alternatives 1 and 2 were determined to be comparable in terms of visual and wind resources selection criteria; however, WTG Array Alternative 1 was found to have several disadvantages. Specifically, WTG Array Alternative 1 would be located near a potential sea duck foraging area and thus could have a greater impact on avian species. Alternative 1 would also require that the Inter-Array Cable pass through the ridge of a terminal moraine that extends south from Block Island's southern shore. Installation of cables through this area of moraine would therefore likely require cutting techniques that will have more significant environmental impacts than installation via jet plow. Additionally, Alternative 1 would require the Export Cable to traverse an area of undisturbed cobble, which poses both a potential geophysical obstruction to cable installation and impacts on important benthic habitat. Lastly, a representative of the Narragansett Indian THPO informed DWBI that locating the WTG Array to the southwest of Block Island would place the Project within a tribally sensitive area, the location of Cautantowwit's house. Cautantowwit is the Narragansett god of the southwest and the souls of the dead travel to his house in the southwest sky and remain there for eternity.

In contrast, WTG Array Alternative 2 would occur in primarily soft bottom substrate and would avoid areas of hard bottom, which would minimize potential impacts on important marine habitats and obstructions to WTG and cable installation. In addition, Alternative 2 would create a shorter route for the Export Cable to Block Island and would allow for the use of jet plowing for installation, which would reduce both environmental impacts and costs.

For these reasons, the WTG Array Alternative 2 is the Preferred Alternative within the REZ.

2. Block Island Substation Alternatives. As stated above, the Block Island Substation is comprised of the BIWF Generation Switchyard and the BITS Island Switchyard. As the BIPCO property represents the only electrical distribution facility on Block Island to which the Project could interconnect, any other site on Block Island would require that additional cable be constructed on Block Island and would result in potential impacts on the local community. Accordingly, this site represents the only location for the Block Island Substation, and other potential locations on Block Island were excluded from consideration. The Applicants did, however, evaluate potential locations for the Block Island Substation within the BIPCO property (Figure 13) based on the following environmental and engineering/construction criteria:

   - Avoid the use of locations with potential contamination;
   - Avoid or minimize impacts on wetlands and associated buffers;
   - Avoid or minimize disturbance to previously undisturbed areas within the BIPCO property;

- Select a site that will minimize visual impacts on surrounding areas; and
- Select a site that will minimize impacts on other sensitive environmental receptors in surrounding areas.

Based on these criteria, the Applicants identified three potential substation locations for the new Block Island Substation within the existing BIPCO property complex:

- Substation Alternative A, located on the eastern side of the BIPCO property, west of the RIDOT garage;
- Substation Alternative B, located on the southwestern side of the BIPCO property complex on land that is currently owned by the estate of Marjorie McGinnes, and currently contains one existing residential structure and one existing light industrial structure; and
- Substation Alternative C located at the northern corner of the BIPCO complex at the intersection of Beach and Ocean Avenues.

Based on the interconnection and substation location selection criteria and results of the site-specific environmental and engineering surveys, the Applicants determined that all three alternatives on the BIPCO property complex would be feasible for development. However, based on feedback from the BIPCO property owner, Alternative C was removed from further consideration. On April 3, 2012, the Town of New Shoreham Zoning Board of Review unanimously approved a Special Use Permit for the Block Island Substation. The Special Use Permit allows for construction of the Block Island Substation at either the Alternative A or B, but indicates a preference for Alternative A (a copy of the decision is included as part of the administrative record). Given the viability of both Substation Alternatives A and B and the Town's approval of either alternative, each of these locations are considered viable by the Corps for development by the Applicants. In response to the preference expressed by the Zoning Board of Review for Alternative A, the Applicants eliminated Alternative B from consideration and the final proposal is for development of Alternative A.

For these reasons, Alternative A is the Preferred Alternative.

3. Alternative WTG Technology. DWBI considered multiple currently available offshore wind turbine technologies in designing the preferred WTG Array. Specifically, DWBI considered the environmental, technical, and financial consequences of the following WTGs and associated combinations to fulfill the purpose and need of the Project:

   - Eight 2.5-MW WTGs = 20-MW BIWF capacity;
   - Eight 3.6-MW WTGs = 28.8-MW BIWF capacity;
   - Six 5-MW WTGs = 30-MW BIWF capacity; and
   - Five 6-MW WTGs = 30-MW BIWF capacity.

   Due to economies of scale, a 30-MW project was determined to be materially more cost effective than smaller project sizes. Therefore, based on the need for cost-effectiveness, project sizes smaller than 30 MW were excluded from consideration. The configuration consisting of five 6-MW WTGs has the ability to achieve the 30-MW target Project size with the fewest number of WTGs. The use of fewer turbines improves the cost-effectiveness of the Project by expediting installation and minimizing environmental impacts, particularly visual impacts and bottom disturbances. As well, use of the 6-MW WTGs has the potential for increasing the Wind Outperformance Adjustment Credit, thereby increasing benefits to Rhode Island ratepayers.

For these reasons, a project configuration consisting of five 6-MW WTGs is the Preferred Alternative.

4. Alternative Foundation Technology. DWBI considered various currently available foundation technologies in designing the preferred WTG Array. Specifically, DWBI considered the environmental, technical, and financial consequences of the following foundation technologies to fulfill the purpose and need of the Project:

   - Monopiles;
   - Steel-piled jackets;
   - Gravity-based structures; and
   - Floating foundations.

   DWBI specifically evaluated each foundation type based on suitability for the bottom type and water depths for the preferred WTG Array, cost-effectiveness, demonstrated success in similar commercial applications, and the supply chain available to support their cost-effective fabrication and installation. Monopile WTG foundations have been cost-ffectively installed in water depths of up to 60 ft (18.3 m). A suitability assessment of monopile foundations found that the weight of the monopiles would be significantly heavier than jackets at this water depth and thus more costly. However, water depths within the REZ are deeper than the monopiles' cost-effective range of approximately 80 ft (24.4 m) (Det Norske Veritas 2010).

   Steel-piled jacket foundations allow WTGs to be installed in deeper waters compared to monopile foundations using currently available technology. The waters in the REZ are of a suitable depth to successfully install WTGs using jacket foundations. Jacket foundations have been used in the offshore oil and gas industry for many years, and their application to WTGs has been proven in commercial European offshore wind projects. Additionally, there is a robust U.S.-based supply chain for the construction and installation of steel-piled jackets. In addition, pile driving during installation of steel-piled jacket foundations results in a smaller acoustic footprint than pile driving during the installation of monopile foundations, therefore minimizing potential impacts on marine mammals and sea turtles. The footprint of disturbance on the seafloor associated with monopiles is larger than for steel-piled jacket foundations.

   Gravity-based structures were assumed to be technically feasible given the conditions within the REZ, but were not cost-effective when compared with steel-piled jackets. Additionally, supply chain issues were identified in setting up for only five foundations.

   Because floating platforms are still in the developmental stage, are generally aimed at cost-effective installations at much deeper water depths, and have not been deployed in commercial offshore wind applications, they are not currently considered technically feasible for the Project.

   Due to their cost-effectiveness, proven application in numerous offshore wind installations, their ability to meet the Project site conditions, the existence of an established supply chain in the United States, and environmental considerations, the jacket foundation is the preferred foundation alternative.

Reference:

Det Norske Veritas, October 2010. Offshore Standard DNV-OS-J101 Design of Offshore Wind Turbine Structures.

No Action Alternative

The no action alternative would be to not issue the requested permits for the BIWF and BITS. The no action alternative would avoid the direct and indirect environmental impacts that would be associated with the proposed Project, but would not achieve the Project purpose to deliver renewable, clean energy to Rhode Island, including Block Island residents, and would frustrate the intent of the state of Rhode Island's expressed need for renewable energy as established by the RIWINDS, codified by Rhode Island State Legislation (RIGL §§ 39-26-1 et seq and 39-26.1-7). The diesel-fired generators that are currently used to power the island would continue to be the only commercial source of electricity on Block Island.

NEPA Alternatives Analysis

The Corps has reviewed the alternatives presented by the Applicants and has determined that the Project configuration presented is the preferred alternative.

Least environmentally damaging practicable alternative ("LEDPA")

The LEDPA is limited to consideration of the Project components resulting in fill. Corps guidance (Regulatory Guidance Letter 93-2) states that "the amount of information needed to make [a determination that a project represents the LEDPA] is commensurate with the severity of the environmental impacts (as determined by the functions of the aquatic resources and the nature of the proposed activity) and the scope/cost of the project. Based on the limited impacts on aquatic and terrestrial resources that will result from the Project, the Corps has determined, and the federal resource agencies do not disagree, that the proposed location and layout of the BIWF and BITS represents the LEDPA to accomplish the Projects' overall purpose.

6. EVALUATION OF THE 404(B)(1) GUIDELINES

(see 40 CFR 230.11 and Subparts C-F)

The proposed Project involves the redeposit of sediments excavated during installation of up to one cofferdam for the long-distance HDD cable landfall installation option off of Scarborough State Beach, cable armoring material at the WTG foundations and along segments of the offshore cables, and redeposit of excavated material to support trenches for the short-distance HDD cable landfall option. As discussed in Section 3, these activities are considered discharge of dredged or fill material into waters of the United States and, therefore, require authorization under Section 404 of the Clean Water Act. This section evaluates the resulting discharge into waters of the United States from these specific Project activities in accordance with the 404(b)(1) Guidelines. The final locations of necessary cable protection and the cofferdam will be determined upon final engineering and installation and will be submitted to the Corps for review. This evaluation considers the length of the proposed submarine cable routes and resulting potential locations for cable armoring and the cofferdam along these routes. Consideration is given to the short-term and long-term effects of proposed discharge on physical, chemical, and biological components of the aquatic environment in light of the following:

a. Physical Substrate Determinations [40 CFR 230.11(a)]:

Substrate impacts [Subpart C, Sec. 230.20]. The substrate around the five WTGs and Export Cable is characterized by unconsolidated sediments within the upper 10 ft to 15 ft (3 m to

4.6 m) of the stratigraphic column with course sediments (sand and gravel with scattered cobbles and boulders) dominant throughout, based on site-specific geophysical and geotechnical surveys conducted by DWBI. One approximately 0.8-mi (1.3-km) section of the Export Cable contains finer sediments that infill a relict depression in that area. Sediments become courser farther west beyond the offshore end of the WTG Array, where boulders are abundant.

The site-specific evaluation of the BITS Cable route indicated that, overall, the area was comprised of unconsolidated sediments within the upper 10 ft to 15 ft (3 m to 4.6 m) of the stratigraphic column with finer sediments (silt, clay, fine sand) found to be more common on shoals and in nearshore areas. Studies also revealed localized areas of coarse material at a number of locations along the BITS routes and the possibility of isolated boulders. More specifically, the route proposed for the BITS consists of mobile sand closest to the Block Island coastline, with pockets of undisturbed cobble present. Moving into the deeper waters along the route between Block Island and Point Judith, Rhode Island, the bottom sediments turn to mostly silty sand and soft silt. The shallow region just south of Point Judith is composed of a mix of mobile sand, gravel, undisturbed cobble, and some silty sand. At the mouth of Narragansett Bay, the sediment type is consistently composed of soft silt.

As stated in Section 5.c, DWBI selected the site for the WTG Array in an area that is predominantly soft bottom substrate to specifically avoid hard substrates that could adversely affect Project costs and feasibility and to avoid impacts to hard bottom marine habitats. DWBIT also selected a cable route for the BITS to avoid hard substrate to the extent possible.

Based on site-specific sediment transport analyses completed by the Applicants and included as Appendix H of the BIWF/BITS ER, impacts associated with the construction and excavation of a cofferdam are expected to be minor and short-term. Modeling of cofferdam construction activities under the worst-case (cofferdam backfilling if required) showed little to no impact on the surrounding environment, as the sheet-piling installed to form the cofferdam would help to prevent sediment from traveling outside the immediate vicinity of the construction area. Excavated sediments placed in the immediate vicinity of the cofferdam will allow for the area to return to pre-construction condition through natural movement (transport) and sorting by waves and currents using materials of similar geologic composition, grain size and biological characteristics. The rate of discharge of material and the potential need for the backfilling of the cofferdam with additional material prior to removal will be determined by the DWBIT during final engineering design and will be submitted to the Corps for review.

During operation, the area needed for cable armoring is small compared to the greater Block Island Sound and Rhode Island Sound; therefore, the Corps has determined that long-term impacts are negligible.

Water Circulation, Fluctuation, and Salinity Determinations [40 CFR 230.11(b)]:

1. Water column impacts [Subpart C, Sec. 230.22]. Refer to Section 6.c.
2. Alteration of current patterns and water circulation [Subpart C, Sec. 230.23]. Long-term alteration of current patterns and water circulation are not anticipated, except for the localized and minor effects from the foundations of the five WTGs.
3. Alteration of normal water fluctuations/hydroperiod [Subpart C, Sec. 230.24]. The Project is not anticipated to alter normal water fluctuations/hydroperiod.

4. Salinity Gradients [Subpart C, Sec. 230.25]. The Project is not anticipated to result in change to salinity gradients.

Suspended Particulate/Turbidity Determinations. [40 CFR 230.11(c)]

Temporary minor turbidity may occur during construction of the BIWF and BITS due to sediment resuspension. The Applicants provided sediment transport modeling analysis in Appendix H of the BIWF/BITS ER. Based on results of this sediment transport analyses, the Corps expects that concentrations of suspended sediment of 100 milligrams per liter (mg/L) would settle within 10 minutes or less.

Contaminant Determinations [40 CFR 230.11(d)]

No introduction of contaminants or increase in contaminant discharge is expected. The Applicants completed a sediment survey and analysis as part of the geophysical and geotechnical investigation for the BIWF and BITS. The data collected was compared to CRMC criteria for beach nourishment and Confined Aquatic Disposal (CAD) cell capping to assess the purity of area sediments. All chemical parameters were below the CRMC-dredged material suitability limits for subaqueous CAD capping purposes and also were below the biological extraneous residue limit concentrations. Therefore, Project Area sediments are considered to be of sufficient quality to be used for marine capping applications in Rhode Island waters.

Aquatic Ecosystem and Organism Determinations [40 CFR 230.11(e)]:

1. Effect to threatened/endangered species and their habitat [Subpart D, Sec 230.30]. The WTGs and submarine cables were sited to avoid protected species habitat. As a result, cable and WTG armoring and cofferdam installation will not affect threatened or endangered species and their habitat. Refer also to Section 8.a., Other Laws, Policies & Effects: Endangered Species Act.

    i. Effect on Fish, Crustaceans, Mollusks and other aquatic organisms in the food web [Subpart D, Sec. 230.31]. DWBIT and DWBI have sited the Project facilities and/or selected construction techniques (e.g., jet plowing and DP vessels for cable installation) to avoid and/or minimize impacts on sensitive marine habitats to the maximum extent possible. As such, the proposed Project cables and WTGs inclusive of armoring and cofferdam installation are expected to have no more than minimal impacts on aquatic resources (see Tables 2 and 3 for acreages of impact from construction and operation). The Applicants intend to install all marine cables to a target depth of 6 ft (1.8 m) beneath the seafloor, although the actual burial depth could vary from 4 ft to 8 ft (1.2 m to 2.4 m) depending on substrate conditions. DWBIT and DWBI will conduct a post-construction inspection using a multi-beam survey and shallow sub-bottom profiler (chirp) to document cable burial depth and to verify reconstitution of the trench. Based upon this post-construction inspection, DWBIT and DWBI will identify if there are areas where less than 4 ft (1.2 m) burial is achieved. In those areas, the Applicants may elect to install additional protection such as concrete matting or rock piles over the buried cable to ensure it is kept in place. Installation of this extra protection will also result in minor temporary impacts from the 8-point anchored barge necessary to support this activity. Results of the benthic resource studies conducted by the Applicants and provided to the Corps (see Appendix R of the BIWF/BITS ER and Attachment 5 of the ER Modification) indicate that the Project Area is dominated by species adapted to a dynamic environment, a factor that enhances the ability of the benthic community to

recover from disturbances. Recolonization of disturbed habitats generally occurs as a result of both larval settlement and migration of individuals from nearby areas. Given the small areas to be affected by Project activities and the widespread distribution of dominant species in Block Island and Rhode Island Sounds, it is reasonable to suggest that either mechanism could occur here. It is also expected that once installation of additional protective armoring is complete, these areas will be suitable for colonization by sessile benthic species characteristic of natural hard substrate. Studies have found that recovery to a mature community can take from several months to several years depending on the nature of the disturbance and the baseline characteristics of the habitat. Therefore, given the limited areas to be affected, the Corps expects that recovery to pre-construction conditions shall be relatively rapid. Refer also to Section 7.g, Fish and Wildlife Values.

ii. Effect on other wildlife (mammals, birds, reptiles and amphibians) [Subpart D, Sec 230.32]. Armoring at WTG foundations and along submarine cables, cofferdam installation, and trench excavation is not expected to affect other wildlife. Refer also to Section 7.g, Fish and Wildlife Values.

Potential Impacts on Special Aquatic Sites (Subpart E):

1. **Sanctuaries and refuges.** Not applicable. There are no federal or state sanctuaries or refuges in the Project Area.
2. **Wetlands**. The Project does not result in fill of wetlands under Corps jurisdiction.
3. **Mudflats**. Not applicable. There are no mudflats in the Project Area.
4. **Vegetated Shallows.** Eelgrass beds are known to occur in isolated shallow coastal water habitats of Narragansett Bay, coastal salt ponds, and the protected harbors of southern Rhode Island and Block Island. The Applicants consulted published data on eelgrass locations near the BIWF and BITS Cable landfalls and conducted an eelgrass and seafloor conditions survey to identify potential eelgrass areas in the Project Area. No eelgrass was identified at the proposed BITS Cable landfall location off of Scarborough State Beach. An existing eelgrass bed was confirmed along the southern margin of Old Harbor, Block Island. To avoid impacts, the Applicants adjusted the proposed landing location for the BIWF Export Cable and BITS Cable to a location approximately 2,000 ft (610 m) north of this confirmed bed. As a result, the submarine cable routes avoid eelgrass beds and, consequently, any necessary cable armoring will not affect eelgrass.
5. **Coral reefs.** Not applicable. There are no coral reefs in the Project Area.
6. **Riffle and pool complexes.** Not applicable. There are no riffle and pool complexes in the Project Area.

Human Use Characteristics (Subpart F).

1. **Effects on municipal and private water supplies.** The discharge of fill material associated with the Project will not affect municipal or private water supplies. Refer also to Section 7.n, Water Supply and Conservation.
2. **Recreational and commercial fisheries impacts**. The areas potentially requiring cable armoring are small in comparison to the area of Rhode Island Sound and Block Island Sound, and as such are not expected to have a measurable impact on recreational or commercial fisheries. Refer also to Section 7.j, Land Use: Marine Uses and Section 7.m, Recreation.
3. **Effects on water-related recreation.** Refer to Section 7.m, Recreation.

i. **Aesthetic impacts.** The BIWF and BITS marine cables will be buried below the seabed and will not result in aesthetic impacts. A portion of the WTG foundation will be submerged. The WTG tower, nacelle and blades will be visible. The cofferdam would be a temporary structure that will primarily also be submerged and not result in visual impact. Refer also to Section 7.c, Aesthetics.

ii. **Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves.** The discharge of dredged or fill material will not occur within any of these types of sensitive areas.

Disposal Site Determination [40 CFR 230.11(f)]

DWBIT will determine the rate of discharge of material and the potential need for the backfilling of the cofferdams with additional material prior to removal during final engineering design and will submit this information to the Corps for review prior to commencing cofferdam installation activities.

Determination of Cumulative Effects on Aquatic Ecosystem [40 CFR 230.11(g)]

The Project is not expected to have any cumulative effect to the aquatic ecosystem. Cumulative impacts are discussed in greater detail in Section 8.d. of this document.

Determination of secondary effects on aquatic ecosystem [40 CFR 230.11(h)]

Secondary effects to an aquatic ecosystem that are associated with discharge of dredged or fill material are effects to an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material. No effects of the authorized discharge of fill material are expected to occur on the site beyond the specific location of the fill, with the possible exception of minor and temporary sediment resuspension and turbidity impacts in the localized area along the submarine cable routes.

Restrictions on Discharges (230.10)

1. Are there available, practicable alternatives to the proposed discharge that would have less adverse impact on the aquatic ecosystem, and that do not have other significant adverse environmental consequences? No. See Section 5; Alternatives Analysis.

   If the project is in a special aquatic site and is not water-dependent, have the Applicants clearly demonstrated that there are no practicable alternative sites available? Not applicable.

2. Will the discharge:
   i. Violate applicable State water quality standards or Section 307 prohibitions or effluent standards? No. State Water Quality Certificates (WQC) were issued by the RIDEM for the BIWF and BITS on May 7, 2014.
   ii. Jeopardize the continued existence of federally listed threatened or endangered species or affects their critical habitat? No. See Section 8.a., Other Laws, Policies & Effects; Endangered Species Act.
   iii. Violate the requirements of a federally designated marine sanctuary? No. There is no federally designated marine sanctuary in the Project Area.

3. Will the activity cause or contribute to significant degradation of waters of the United States, including adverse effects to human health; lifestages of aquatic organisms' ecosystem diversity, productivity and stability; and recreation, aesthetic, and economic

values? No, State WQCs were issued on May 7, 2014. See also Sections 6.a. through d., e.2, g.3 and k.2.i, and Sections 7.b. and c.

4. Have appropriate and practicable steps been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem? Yes. See Section 7.g, Fish and Wildlife Values.

7. PUBLIC INTEREST REVIEW FACTORS (33 CFR 320.4(A)(1))

a. Conservation

The Project will not result in the conservation of additional land or the use of lands conserved for other purposes. Neither the BIWF nor the BITS terrestrial cable landfall activities or facilities cross any conservation lands. The offshore portions of the BIWF and BITS do not traverse any marine sanctuaries or other such marine conservation areas. Additionally, the BIWF is located entirely within the REZ established by the RI Ocean SAMP.

b. Economics

A review of the U.S. Census Bureau data (2010b), as well as data from the American Community Survey five-year estimates (2006-2010) and three-year estimates (2008-2010), as available for each community, were used to evaluate existing economic conditions within Washington County and the associated communities for which Project activities are proposed (New Shoreham, Narragansett and South Kingstown). Each of the affected communities in Washington County offer a wide range of public services and facilities, including hospitals, full-service law enforcement, paid and volunteer fire departments, and schools. The top three industries identified for Washington County are educational services, health care and social assistance; retail trade; and arts, entertainment, recreation, accommodation and food services (U.S. Census Bureau 2010a, 2010b). Of these three industries, services supporting tourism and hospitality within the state of Rhode Island contributed $6.8 billion in spending and generated 12 percent of all state and local tax revenue in 2007 (RI Ocean SAMP 2012). The RI Ocean SAMP further reports that according to the National Ocean Economics Program, in 2004 the recreation and tourism in two coastal counties (Washington County and Newport County) adjacent to the RI Ocean SAMP area where the proposed Project facilities and activities will be located, included 779 different establishments and 10,086 employees. The industry was also calculated to have paid over $161 million in wages and produced $393 million in gross domestic product in 2004. Overall Rhode Island tourism is centered on marine recreational activity like boating, sailing, diving, and wildlife viewing, as well as seaside travel destinations and shore-based activities such as surfing or beach-going. Recreation and tourism in the state of Rhode Island are largely seasonal, with coastal communities doubling and tripling in population during the summer months.

Housing statistics for Washington County, Rhode Island, and the communities affected by the BIWF and BITS were also assessed. Median value of owner-occupied units in 2010 ranged from $343,500 in South Kingstown to $1,000,000+ in New Shoreham; median value for owner-occupied units for the state was $254,500 (U.S. Census Bureau 2010a, 2010b).

Demographics within Washington County indicate that the minority populations in the communities surrounding the Project Area do not exceed 50 percent, and the percentage of minorities and people with income below poverty level are not significantly higher than for the state of Rhode Island (U.S. Census Bureau 2010a, 2010b). As such, none of the communities surrounding the Project Area are considered environmental justice communities.

Direct and indirect economic benefits are expected from construction and operation of the BIWF and BITS. Construction of the BIWF will require a workforce, both in Rhode Island and out of state, for WTG pile fabrication, Project management and construction. Additional construction

personnel hired from outside the state of Rhode Island will typically include mariners, cable manufacturing personnel, and other specialists who may temporarily relocate to the communities surrounding the Project Area during the construction period. Operation of the BIWF will require a full-time, onshore staff of approximately two employees over the life of the BIWF and the marine and landside resources required to maintain and service the facilities. In addition to these direct economic benefits associated with jobs and wages resulting from the development of the BIWF, DWBI anticipates that the BIWF will also likely facilitate new and existing business expansion opportunities. According to a study commissioned by the Rhode Island Economic Development Corporation (RIEDC), the estimated economic benefit attributable to the BIWF is $129 million in constant 2010 dollar terms as of January 1, 2013 (RIEDC 2010 as amended).

DWBIT estimates that construction of the BITS, including the onshore and offshore portion of the BITS line and the associated onshore facilities, will require a workforce of approximately 150 personnel during the anticipated eight-month construction period. Local personnel could account for up to 50 percent of the total BITS construction workforce. Additional construction personnel hired from outside the state of Rhode Island will typically include mariners, cable manufacturing personnel, and other specialists who may temporarily relocate to the communities near the Project Area during the construction period. Operation of the BITS is anticipated to be managed by TNEC and therefore performed by existing TNEC workforce throughout the operational life of the BITS.

Overall, the Applicants expect that the employment of both local and non-local workers associated with the construction and operation of the BIWF and BITS would benefit the local economy by providing a beneficial economic impact on local communities through employment opportunities, construction payroll expenditures, purchases of construction goods and materials, and local expenditures by workers.

Impacts on tourism and recreation from the construction and operation of the BIWF and BITS could temporarily affect coastal and marine recreational activities such as boating, sailboat racing, wildlife viewing and recreational fishing within the proposed construction area for the WTGs and along the cable corridors associated with the Inter-Array Cable, Export Cable, and BITS. However, given the short marine construction schedule for the BIWF and the BITS, these impacts are expected to be short-term and minor. In addition, construction within the Project Area will only affect discrete portions of the Rhode Island Sound and will not preclude recreational activities from occurring in the surrounding portions of the Sound. As described previously, DWBIT and DWBI will implement a communication plan during construction to inform the public and associated businesses of construction activities and vessel movement. During operation of the BIWF, no navigation exclusion areas would be implemented for any vessels. The wind farm itself may become a tourist attraction, contributing additional revenues to state and local economies. Refer to Section 7.m for further discussion of impacts on both recreation and tourism. Refer also to the marine uses discussion in Section 7.j for a discussion of the fishing industry.

Along the onshore portions of the BIWF and BITS Cable routes, construction may cause temporary disruptions to activities such as wildlife viewing, seaside travel, and beach-going. These disruptions will be from the temporary increased traffic within the Project Area from construction activities along and within existing roadways and the use of local roadways by construction vehicles and associated personnel. However, given the Applicants' intent to concentrate onshore construction activities between winter and early spring and outside of the tourist season, these impacts are expected to be short-term and minor. Additionally, because the Project cables on shore will be buried and will follow existing road rights-of-way through seaside recreational areas and Project interconnection facilities will be located on previously disturbed

properties, operation of the onshore portions of the BIWF and BITS will have no long-term effect to tourism and recreation. Refer to Section 7.m for further discussion of impacts on both recreation and tourism. Refer also to the marine uses discussion in Section 7.j for a discussion of the fishing industry.

With regard to impacts on public services, construction of the BIWF and BITS is not expected to affect public services or infrastructure, particularly given the relatively small number of non-local workers anticipated to relocate temporarily to the Project Area. The influx of non-local workers associated with the Project will be small relative to the current populations in the Project Area. Washington County and the communities in the Project Area have adequate infrastructure and services to meet the needs of the non-local workers. During operations, DWBIT and DWBI O&M personnel will be trained to perform their jobs properly and safely, including proper training in the operations of all equipment, workplace safety, and incident response. The Applicants have prepared a Draft Emergency Response Plan for the Project (included in Appendix U to the BIWF/BITS ER) in the event of an emergency situation. This plan will be reviewed with the USCG and state and local emergency response agencies prior to the construction and operation of the Project. In addition, prior to the commencement of construction, operation, and decommissioning activities, a facility-specific environmental compliance manual will be prepared for the Project outlining specific construction and operating obligations. This manual, in conjunction with an Emergency Response Plan for construction and operation, will ensure that no adverse impacts on public services in area communities result throughout the Project life cycle. Refer to Section 7.q for further discussion of safety.

References:

RIEDC. 2010. Advisory Opinion of the Economic Development Benefits of the Proposed Block Island Wind Farm. Prepared by Levitan & Associates, Inc. as amended on July 26, 2010.

RI Ocean SAMP (Rhode Island Ocean Special Area Management Plan). 2012. Rhode Island Coastal Resources Management Council. Final, January 11, 2012.

U.S. Census Bureau. 2010a. FactFinder2 - 2010 Demographic Profile Data: DP-1, Profile of General Population and Housing Characteristics for the Towns of New Shoreham, Narragansett, South Kingstown, and North Kingstown in Washington County, Rhode Island; Washington County; and the State of Rhode Island. Accessed December 2011 at http://factfinder2.census.gov/faces/ nav/jsf/pages/index.xhtml.

U.S. Census Bureau. 2010b. FactFinder2 – DP03, Selected Economic Characteristics: American Community Service 5-Year Estimates (2006-2010) and 3-Year Estimates (2008-2010) for the Towns of New Shoreham, Narragansett, South Kingstown, and North Kingstown in Washington County, Rhode Island; Washington County; and the State of Rhode Island. Accessed December 2011 at http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

c. Aesthetics

The visual landscape surrounding the WTGs consists of open ocean and coastal features present in southeastern Block Island, such as cliffs and beaches. The three distinct viewer groups in this area are local residents, through travelers, and tourists/vacationers. On Block Island, the landscape within the visual study area consists of shoreline bluffs, low-density residential development, beaches, and commercial development associated with the tourist center of Old Harbor. In the immediate vicinity of the Block Island Substation, the visual landscape is dominated by the existing BIPCO power generation facility. The visual landscape on the

mainland along the BITS Scarborough Beach Alternative route consists primarily of beaches, seasonal and permanent residential development, and commercial and industrial development.

During construction, marine vessel traffic will increase in Narragansett Bay, off of Block Island, and in the open ocean. The construction vessels will not represent a significant increase over the existing vessel traffic in the area and accordingly will not have appreciable visual impacts (see also Sections 7.k. Navigation). Installation of the terrestrial cables and construction of the switchyards on Block Island and in Narragansett will result in minor and temporary visual impacts typically associated with the presence of construction equipment and workspace signage on local roads and in the local landscape. Construction activity will result in some visible site disturbance, such as tree clearing, earth moving, and facility installation. Construction impacts are anticipated to be short-term and localized. DWBI and DWBIT will construct onshore facilities during fall, winter or spring to avoid impacts on the summer tourist season, which will mitigate construction phase visual impacts on seasonal residents and recreational and tourist/vacationers.

The Applicants submitted a VIA to the Corps as part of the BIWF/BITS ER (Appendix S and Attachment 11 to the ER Modification) to support agency evaluation of aesthetics and visual impacts resulting from operation of the BIWF and BITS. The VIA included a viewshed analysis and visual simulations for both the BIWF and BITS, specifically the WTGs and the aboveground terrestrial facilities on Block Island and the Dillon's Corner Switchyard in Narragansett. The VIA study area considered a 30-mi (48.3-km) radius for the WTGs and a 0.5-mi (0.8 km) radius for the terrestrial facilities and included evaluation of impacts on views to local residents, through travelers, and tourists/vacationers associated with both landscape and seascapes found within the VIA study area. Sites identified as having historic significance (e.g., Southeast Light) that are within the VIA study area were also included in the VIA. The Inter-Array Cable, Export Cable, and submerged portion of the BITS Cable are submarine cables and will not result in visual impacts during operation.

The viewshed mapping, which considered screening from topography and mapped forest vegetation, demonstrated that the WTG Array has the potential to be visible from a relatively small portion of the 30-mi (48.3-km) WTG visual study area. Topography alone will screen the WTG Array from view in over 55 percent of the land area. The majority of visually sensitive resources with potential views of the WTG Array are located on Block Island, within 1 mi (1.6 km) of the Rhode Island mainland coast, and directly on the coast of Connecticut. Visually sensitive resources on Block Island are at least 3 mi (4.8 km) from the WTG Array, the Rhode Island mainland coast is at least 15 mi (24.1 km) from the WTG Array, and the Connecticut coast is at least 20 mi (32.2 km) from the WTG Array.

The results of the viewshed analysis likely overestimate potential visibility because the effects of screening by buildings, street/yard trees, weather conditions, or curvature of the earth were not included in the assessment. Field review revealed that open views toward the WTGs were concentrated along the shoreline, and largely restricted to beaches, bluffs, dunes, salt ponds, small open fields, and residential yards where lack of foreground trees allowed for unscreened views of the ocean.

Visual simulations of the BIWF indicate that the visibility and visual contrast of the WTGs will vary greatly based on the character of the surrounding landscape and distance of the viewer from the WTGs. In general, all land-based views will be beyond 3 mi (4.8 km), and the closest mainland viewpoints will be over 15 mi (24.1 km) away. The majority of the visual simulations indicated relatively minor impacts from more distant viewpoints on the mainland, which consistently demonstrated that the WTGs appear as an extremely small cluster or vertical white lines on the horizon that cannot be clearly identified as WTGs and under most weather/sky conditions would be difficult to perceive. The more appreciable impacts were concentrated on

the southern shoreline of Block Island, where visual impact was mostly attributable to the WTGs contrast with water resources (open ocean), user activity (residential and tourist-related), and land use (undeveloped land and ocean).

Nighttime viewshed analyses and visual simulations were also conducted for the WTG Array based on the assumption that all of the WTGs will include FAA obstruction warning lights at a height of 410 ft (125 m) above MLW. Viewshed analysis indicated that the FAA warning lights on the WTGs could potentially be viewed from 37.5 percent of the land within the WTG Array visual study area. Visual simulations showed that the red FAA warning lights contrast with their dark setting and the flashing of these lights could draw viewer attention and differentiate them from other existing light sources. However, the visual impact of these lights is minimized by their small number, moderate intensity, and perceived occurrence among other existing lights.

The terrestrial portion of the Export Cable will be buried up to the BIPCO property, except where it crosses the bridge between Trims Pond and Harbor Pond, and therefore, is not anticipated to result in visual impacts during operation. The overhead segment of the Export Cable and the BIWF Generation Switchyard will be located on the BIPCO property and, as a result, will not introduce a new type of visual element into the existing landscape. According to the VIA conducted for this portion of the BIWF, views of the proposed Block Island Substation and associated overhead lines will be limited, and their appearance generally compatible with the existing facilities/landscape components on and adjacent to the BIPCO property.

On Block Island, the BITS terrestrial cable will be collocated with the BIWF Export Cable, and the BITS Island Switchyard will be part of the Block Island Substation, and therefore operation phase impacts are the same as discussed for the BIWF facilities on Block Island. In Narragansett and South Kingstown, the BITS Cable will be entirely buried in developed roadways up to the Dillon's Corner Switchyard and between the Switchyard and the exiting Wakefield Substation and, therefore, will not result in visual impacts during operation. A viewshed analysis, visual simulations and field review for the Scarborough Beach Alternative were presented in the supplemental BITS VIA submitted to the Corps by the Applicants in the BIWF/BITS ER Modification in Attachment 11. The VIA determined that the Switchyard will result in only minor impact on visual quality. The Switchyard will be located at the site of an existing salt storage yard between two roadways and will be screened by vegetation in accordance with a landscaping to be determined by DWBIT and the RIDOT. Additionally, based on the limited visibility of the Wakefield Substation from sensitive visual receptors documented during field review, and the fact that the new riser structure will replace an existing riser structure of the same or larger dimensions, in the same location, this component of the Scarborough Beach Alternative will be difficult to perceive and will not change the appearance/visual character of the existing substation.

The five WTGs will be visible from locations on the southeast coast of Block Island. The Applicants completed a VIA using the Corps Visual Resources Assessment Procedure (VRAP), which was included as Appendix S of the BIWF/BITS ER. The VIA determined that with the proposed Project in place, the threshold of acceptable visual impact was not exceeded for any of the landscape similarity zones identified within the visual study area. This finding also reflects the fact that DWBI has incorporated several measures that reduce or mitigate visual impact into the design of the BIWF, including placement of turbines as far offshore as possible while remaining within the REZ, reducing the number of WTGs from eight to five, the uniform design and white or light grey color of the WTGs, and utilization of FAA warning lights with a narrow beam bath and the longest off-cycle permitted by the FAA. Refer to Section 7.f for a determination specifically related to visual impacts on historic properties.

d. General Environmental Concerns

Potential adverse impacts of the Project overall are relatively minor and are outweighed by the positive impacts on the local, regional, and state economy and the positive impacts associated with energy production from a renewable, non-combustible source. More specific potential impacts on the public interest are noted elsewhere in this section. Three additional considerations not specified in regulations but relevant to an offshore wind energy project are addressed below:

1. Noise. The Project will generate noise during construction and operation, and since the BIWF and BITS have both onshore and offshore components, the potential effects of both in-air and underwater sound were considered. The Applicants submitted in-air and underwater acoustic modeling studies to the Corps as part of the BIWF/BITS ER (Appendix N and Attachment 6 of the ER Modification). The analysis considered in-air acoustic impacts during construction from pile driving for WTG foundation installation, the HDD drill rig, and vibratory pile driving for the proposed cofferdam associated with the long-distance HDD for the BITS off of Scarborough State Beach.

   Results of the in-air noise analyses provided by the Applicants, indicate that individual noise producing elements (impact pile driving, vibratory pile driving, HDD construction) and other construction activities may result in acoustic impacts from the BITS and BIWF throughout the construction period. Construction will generate short-term temporary in-air noise levels that will not be continuous, but will vary as equipment usage and distance to noise-sensitive receptors change throughout the construction period. Results of the in-air pile driving modeling analysis revealed that all pile driving activities will be well below the Town of New Shoreham noise ordinance for construction activities. However, DWBI and DWBIT have committed to not initiating pile-driving activities at night. Although construction will generate high intermittent in-air noise, it will cease upon completion of construction.

   Operational in-air acoustic impacts would be associated with the WTGs, fog horn, and switchyards. Sound generated by WTGs comprises both aerodynamic and mechanical sound, the former being the dominant sound component from utility-scale WTGs. DWBI submitted a modeling analysis for sound propagation under downwind and anomalous conditions using historic meteorological data for the site. Under all modeled scenarios, received sound levels at identified shoreline noise sensitive receptors are expected to be below 25 A-weighted decibel (dBA), which is well below the Town of New Shoreham 55 dBA nighttime limit.

   During operation, the primary noise-generating activity will be from the BIWF nautical hazard prevention device (i.e., foghorn). The proposed foghorn is expected to periodically result in low-level sound at shoreline noise-sensitive receptors; however, the operation of foghorns is exempt from restriction under 33 CFR 67. The foghorn will be centrally located within the WTG Array at WTG 3, and operation of the foghorn will only occur when necessary during periods of poor visibility or inclement weather.

   Modeling results show that the BIWF and BITS switchyards on Block Island may be periodically audible off-site, but will be in compliance with the Town of New Shoreham requirements. Additionally, the facilities on Block Island will be located at the site of an existing operating power generation facility.

   In-air noise associated with the eventual decommissioning of the on and offshore portions of the Project will involve comparable types of activities and will be less than or equivalent to those associated with construction.

   An underwater acoustic assessment was also prepared by the Applicants to support consultation with NMFS regarding potential harassment to marine mammals (BIWF/BITS

ER (Appendix N and Attachment 6 of the ER Modification). The underwater acoustic analysis considered noise from construction activities, including impact pile driving of the WTG foundations, vibratory pile driving of the cofferdam, and DP vessel thruster use during the BIWF and BITS marine cable installation. Refer to Section 7.g. for discussion of potential underwater acoustic impacts on marine wildlife.

2. Air Quality. The latest air quality concentration trends published by the RIDEM show that concentrations of criteria pollutants and selected "toxic" or "hazardous" air pollutants (i.e., those that have been tracked for multiple years) have shown decreasing trends over the last several years or decades (with the exception of formaldehyde and acetaldehyde, which showed no obvious trend) (RIDEM 2009). With regard to the NAAQS, the only "nonattainment" classification in the entire state of Rhode Island is for ozone, and EPA determined that the state met the 1997 ozone standard of 0.08 parts per million (ppm) by the June 2010 statutory deadline (EPA 2010). EPA has classified the entire state as "attainment/unclassifiable" with respect to the new ozone standard of 0.075 ppm (EPA 2012) and has proposed to rescind the older ozone standard.

   An offshore wind energy project generates energy without by-product emissions such as carbon dioxide (CO_2) or sulfur-containing compounds. Air emissions associated with Project activities are the result of marine vessels and machinery (e.g. cranes and compressors) needed to construct the Project and perform O&M activities. The Applicants completed emissions calculations for construction and operation, including activities at the Quonset Point port, as well as for vessels traversing state and federal waters and at the BIWF and BITS facilities. This analysis was submitted to the Corps as Appendix K of the BIWF/BITS ER. Air emissions associated with construction are anticipated to be short-term and minor. Emissions associated with the eventual decommissioning of the on and offshore portions of the Project will involve comparable types of equipment and will be less than or equivalent to those associated with construction. The Corps consulted the EPA Region 1 office regarding these emissions. Refer to Section 11.a for a discussion of the applicability of a conformity determination for the BIWF and BITS, respectively.

   References:

   EPA. 2010. Approval and Promulgation of Air Quality Implementation Plans; Rhode Island; Determination of Attainment of the 1997 Ozone Standard for the Providence, RI Area. Federal Register Volume 75, page 64949, October 21.

   EPA. 2012. Air Quality Designations for the 2008 Ozone National Ambient Air Quality Standards. Federal Register Volume 77, page 30088 et seq., May 21.

   RIDEM. 2009. Air Quality Summary 2009, State of Rhode Island. Prepared by the Rhode Island Department of Environmental Management, Office of Air Resources, and the Rhode Island Department of Health, Air Pollution Laboratory. Available from http://www.dem.ri.gov/ programs/benviron/air/pdf/aqds2009.pdf.

3. Shadow Flicker. DWBI submitted a shadow flicker analysis to the Corps as Appendix M of the BIWF/BITS ER to support the evaluation for potential impacts from the WTGs with the ER. The analysis indicated that shadow flicker will not impact the Block Island shoreline. Shadow flicker impacts will be restricted to overwater areas surrounding the WTGs. Boaters traversing the area near the WTGs may experience periods of shadow flicker. However, due to the temporary and intermittent nature of shadow flicker and boat traffic, impacts are expected to be minor and short-term.

e. Wetlands

The Applicants have avoided the need for permanent fill or discharge to federal jurisdictional tidal and non-tidal wetlands by design of the BIWF and BITS Cable routes and the proposed switchyard locations. The Export Cable will be collocated with the BITS terrestrial cable within existing road rights-of-way from the manhole at the Town Beach Parking Lot to the BIPCO property. Construction of the Export Cable and BITS Cable on Block Island will result in the aerial crossing of a tidal estuarine wetland at the location between Trims Pond and Harbor Pond. For this crossing, the cable will be suspended on the north side of the Beach Avenue Bridge for an approximately 45-foot span. Work will be completed from Beach Avenue. The Applicants are working with the CRMC and RIDEM to obtain the necessary permit authorizations for work affecting wetlands under state buffer zone jurisdiction.

f. Historic Properties

The Applicants have submitted several desktop and field surveys of the marine and terrestrial environments to identify and avoid impacts on marine and terrestrial cultural resources to the extent practicable. Specifically, the Applicants conducted detailed marine and terrestrial cultural resource surveys, including both Phase I Marine and Terrestrial Archaeological Surveys and a Phase II Terrestrial Archaeological Survey at the Harbor Pond Site on Block Island.

1. Marine archaeological resources. The Applicants sited the Project components outside of known submerged cultural resources, and the site-specific investigations did not identify any evidence of archaeologically sensitive paleosols or pre- and post-contact period cultural materials within the footprint of the Project components. Disturbance to potential submerged cultural resources may occur as a result of anchor drop and anchor sweep from the derrick barge associated with the installation of the WTGs. Additionally, during the site-specific marine archaeological survey for the BITS, a cluster of magnetic anomalies was identified within 100 ft (30.5 m) of the surveyed centerline, referred to as BITS Cluster 1. The Corps has specified avoidance buffers, additional surveys, construction monitoring, unanticipated discovery procedures, and other measures to protect cultural resources during construction and operation of the BIWF and BITS in individual Memorandums of Agreement (MOAs) with BOEM and the RIHPHC as signatories. Compliance with the BIWF and BITS MOAs has been included as a Special Conditions to the BIWF and BITS permits, respectively (refer to Section 11.f).

2. Terrestrial archaeological resources. The Applicants sited the terrestrial components of the BIWF and BITS within previously disturbed areas to the extent practicable and has taken into consideration the results of terrestrial archaeological studies and agency and tribal input during development of the proposed Project. The Corps has determined that the Project, specifically the terrestrial component of the BIWF Export Cable and BITS on Block Island, has the potential to adversely affect one site, the Harbor Pond Archaeological Site, which has been determined eligible for listing in the National Register. The Corps has specified avoidance buffers, additional surveys, construction monitoring, unanticipated discovery procedures, and other measures to protect cultural resources during construction and operation of the BIWF and BITS in individual MOAs with BOEM and the RIHPHC as signatories. Compliance with the BIWF and BITS MOAs has been included as a Special Conditions to the BIWF and BITS permits, respectively (refer to Section 11.f).

3. Aboveground historic properties. The Corps has determined, in consultation with the RIHPHC, that construction of the BIWF will have an adverse effect under 36 CFR 800.5(a) on National Register-listed and National Register-eligible sites because the BIWF may result in visual alteration and physical disturbance to these sites. Consequently, the BIWF MOA requires DWBI to protect historic properties, including measures to mitigate visual impacts.

The Corps has included compliance with the BIWF MOA as a Special Conditions to the BIWF permit (refer to Section 11.f).

The Corps has determined that the BITS will not have an adverse effect on aboveground historic properties.

g. Fish and Wildlife Values

The Applicants completed several studies to characterize benthic and shellfish resources, finfish resources, essential fish habitat (EFH), marine mammals, terrestrial habitats, and avian and bat resources near the Project since 2009 and has designed the BIWF and BITS to avoid and minimize impacts on these resources to the extent practicable. The results of these studies have been provided to several federal and state fish and wildlife resource management agencies for their review (refer also to Sections 8.a and 8.b for findings resulting from inter-agency consultation regarding endangered species and EFH, respectively).

1. Benthic and shellfish resources. Benthic and shellfish resources, including those with early life history stages (e.g., eggs and larvae) that are restricted to the benthic environment (e.g., long fin squid eggs, juvenile scallops, quahogs, and surf clams), will have the greatest potential for impact from Project activities. Impacts will be the result of bottom disturbing activities associated with cable installation and vessel anchoring, as well as cofferdam installation and removal. The Applicants have minimized impacts on these resources to the extent possible by siting the BIWF within the designated REZ and avoiding direct impacts on important habitats such as eelgrass and hard bottom substrates throughout the Project Area. While construction activities could potentially occur during seasons associated with spawning and larval recruitment (spring through fall), the Applicants have selected construction techniques and equipment, such as a jet plow and use of a DP vessel to minimize benthic disturbances. These construction best practices minimize the impacts of increased turbidity and subsequent sedimentation as well as the alteration of substrate to the maximum extent possible during construction. A sediment dispersion modelling analysis was provided to the Corps as Appendix H of the BIWF/BITS ER. Construction activities themselves will result in a small combined total area of approximately 89.5 ac (36.2 ha) across the entire Project Area (44.2 ac [17.9 ha] associated with the BIWF and 45.3 ac (18.3 ha) associated with the BITS). Of the total area disturbed, all areas are expected to return to pre-construction conditions except for approximately 0.7 ac (0.3 ha) of habitat that would be permanently converted to hard substrate. These new hard bottom areas will be suitable for colonization by sessile benthic species characteristic of natural hard substrate communities.

   During operations, effects to benthic resources are not likely. Decommissioning activities associated with the Project similar to construction activities, would result in temporary disturbances to benthic resources, but effects and recovery rates are expected to be similar as described for construction with no long-term effects. When considered together with the existing resources in the Project Area of the BIWF and BITS, the combined impacts associated with the construction, operation, and decommissioning will be minor and short-term. Additionally, DWBI has voluntarily committed to and already begun conducting a 4-year Lobster Survey (2 years pre-construction, 1 year during construction, and 1 year post-construction) to provide a site-specific assessment of the impacts from construction of the BIWF on the local lobster community.

2. Finfish resources. As discussed for benthic and shellfish resources, DWBI has minimized impacts on benthic habitats and species and lifestages that are restricted to the benthic environment by siting the BIWF within the designated REZ; avoiding direct impacts from the BIWF and BITS on important habitats, such as eelgrass and hard bottom substrates known to be used by finfish species throughout various lifestages; and selecting construction techniques

and equipment, such as a jet plow and a DP vessel, to minimize disturbance and alteration of substrate to the maximum extent possible during construction activities for the BIWF and BITS. The species and associated lifestage most susceptible to impact from construction activities are likely winter flounder eggs. EFH for winter flounder has been defined as water less than 16 ft (5 m) deep in areas where hydrodynamics will prevent dispersal of larvae (NOAA 2014). Although the preferred habitat for winter flounder eggs is shallow water, recent studies have documented the deposition of eggs in waters deeper than 16 ft (5 m). Specifically, winter flounder in the southern Gulf of Maine and the New York Bight may use nearshore or inner continental shelf habitat for spawning to a greater degree than originally thought (Wuenschel et al. 2009; DeCelles and Cadrin 2010; Fairchild et al. 2012). However, the results of BIWF and BITS geophysical and sediment surveys indicate the presence of both sand waves and trawl scarring throughout much of the Project Area, which is a strong indicator of both an active and high-energy environment with bottom currents and other external factors regularly moving surface sediments. Winter flounder spawning adults have been shown to prefer areas where eggs would be minimally displaced by tidal currents to retain larvae in suitable nursery areas (Crawford and Carey 1985; Monteleone 1992). In such a high energy environment, demersal adhesive winter flounder eggs will likely be swept into the water column from their original deposition area or possibly buried.

The Corps does not expect the construction and operation of the BIWF or the BITS or the decommissioning of the BIWF or the BITS to result in long-term impacts on finfish resources identified within and in the vicinity of the Project Area. Construction activities may, however, result in minor, short-term impacts from disturbance or alteration of habitat, increased suspension of sediments, and increased noise. DWBI has voluntarily committed to and already began conducting a 5-year trawl survey (2 years pre-construction and 3 years during operation) in the area of the BIWF to assess impacts on the local finfish community from construction.

Additionally, the Applicants submitted an EMF assessment to the Corps as Appendix M of the BIWF/BITS ER. The EMF assessment was conducted in response to agency concerns regarding potential impacts of EMF from submarine cables on species with magnetite-based sensory systems. The analysis was also submitted as part of the Biological Assessment to NMFS for review. NMFS concluded in their Biological Opinion that the grounded metallic shielding that encases the three-core conductors associated with the BIWF Inter-Array, Export, and BITS Cables will effectively block any electric fields generated during operation. The containment of all three phases of each circuit within the submarine cables will also result in the significant cancellation of the magnetic fields produced by the circuits as a whole. Additionally, frequency of the magnetic field to be produced by the BIWF Inter-Array, Export and BITS Cables will be 60-hertz (Hz). 60-Hz alternating powerline EMF fields, such as those generated by the proposed marine cables, have not been reported to disrupt marine organism behavior, orientation, or migration. Based on the results of the Applicants' EMF assessment and the body of scientific evidence reviewed, NMFS concluded that there would be no anticipated adverse impacts expected from the BIWF and BITS Cables or other components of the Project on the behavior, orientation, or navigation of marine organisms.

References:

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DeCelles, G.R. and S.X. Cadrin. 2010. Movement pattern of winter flounder (Pseudopleuronectes americanus) in the southern Gulf of Maine: observations with the use of passive acoustic telemetry. Fishery Bulletin 108:408-419.

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NOAA (National Oceanographic and Atmospheric Administration) 2014. Essential Fish Habitat Description Winter Flounder (Pseudopleuronectes americanus). http://www.nero.noaa.gov/hcd/winter.pdf. Accessed June 2014.

Wuenschel, M.J., K.W. Able, and D Byrne. 2009. Seasonal patterns of winter flounder Pseudopleuronectes americanus abundance and reproductive condition on the New York Bight continental shelf. Journal of Fish Biology. 74, 1508-1524.

3. Marine Mammals and Sea Turtles. Construction, operation, and decommissioning activities have the potential to impact marine mammals and sea turtles through reductions in prey availability, loss of habitat, entanglement, acoustic harassment, vessel strike, and degradation of water quality from fuel spills and marine debris. Reductions in prey species availability are unlikely, as impacts on benthic and finfish resources from substrate disturbance and sediment suspension will be local and short-term, resulting in no significant impacts on marine species that would be targeted for consumption by whales and/or turtles. Impacts from loss of habitat will also be negligible, and would be limited to the area of the WTGs and cable armoring. Entanglement is also highly unlikely because the only lines deployed in support of the Project will be associated with the marine vessel anchor cables and jet-plow towing cable. The Corps has consulted with the NMFS regarding potential impacts on marine mammals and sea turtles, particularly regarding impacts from noise, increased vessel activity, accidental fuel spills, and marine trash/debris during construction of the BIWF and BITS and understands that the Applicants have limited impact pile driving during the months of May to October, which avoids the migratory period for critically endangered species such as the North Atlantic right whale. The Applicants have also applied for IHA from NMFS that will result in the implementation of mitigation and monitoring measures to avoid and minimize impacts on marine mammals and sea turtles.

4. Terrestrial Habitat and Wildlife. On Block Island, impacts on the beach are expected to be minor and short-term due to the short-distance HDD construction methodology that will avoid disturbance to sand dunes and result in a buried cable during operation. On the mainland, the use of a long-distance HDD will avoid disturbance to the beach. The BIWF and BITS terrestrial facilities have been sited in previously disturbed and developed areas to the extent possible. Therefore, disturbance or displacement impacts from the Project during construction and operation, as well as decommissioning, are expected to be minor. Minimal vegetation clearing will be required for the overhead line on the BIPCO property and for the BITS Dillon's Corner Switchyard on RIDOT property. Resource area field delineations and site-inspections were conducted by the Applicants and submitted to the Corps with the BIWF/BITS ER as Appendix J and Attachments 7 and 12 of the ER Modification. Results of these field analyses and associated literature reviews revealed minimal natural or valuable

habitat; therefore, natural habitats for wildlife species are not anticipated to be affected by the Project.

5. Avian and Bat Species. The Applicants completed 3 years of pre-application avian and bat surveys under a protocol reviewed and approved by the USFWS and the Corps. Results of the surveys indicated that the proposed WTG location, southeast of Block Island, has the least potential for interaction with avian and bat species of any location within the REZ. DWBI has reduced the number of WTGs from eight to five, which also minimizes the potential for interaction between WTGs and avian and bat species. DWBI has committed to additional avian and bat surveys, which will occur pre-construction, during construction and post-construction. These surveys were developed in consultation with the USFWS and are described in the Avian and Bat Post-Construction Monitoring Plan dated February 28, 2014. Potential environmental effects from collecting post-construction monitoring data on birds in the BIWF Project Area would be limited to impacts from the operations of the survey vessel (a maximum of 200 vessel hours). No wildlife will be handled, captured, or restrained during wildlife assessment surveys for the BIWF. Onshore facilities have been primarily located along existing rights-of-way and in currently developed areas to minimize interaction with avian and bat species. The BITS Cable will be a submarine cable offshore and buried onshore, with the exception of 0.2 mi on the BIPCO property and a 45-foot span along the bridge across Trims Pond, and therefore, is not expected to impact avian and bat species.

h. Flood Hazards

The majority of the Project infrastructure is located within the marine environment. Terrestrial components are primarily buried cables from the shore inland. None of the aboveground switchyards and associated interconnection facilities are located within 100-year floodplains, as defined by the Federal Emergency Management Agency.

i. Floodplain Values

The Applicants will each prepare a stormwater management plan that will be approved by RIDEM. Implementation of the stormwater management plans will ensure that the BIWF and BITS do not cause or increase flooding or flood hazards or otherwise impede any floodplain values.

j. Land Use

1. Land Use and Zoning. The terrestrial Project facilities will be located in the Towns of New Shoreham and Narragansett in Washington County, Rhode Island. Construction staging and laydown for the WTGs is proposed to occur out of the Quonset Point port facility in North Kingstown, Washington County, Rhode Island.

   Existing land use on Block Island consists primarily of open space, seasonal and permanent residences, beaches and other recreational areas, and municipal facilities that provide utility and other services to the island. Development consisting of commercial, municipal, and higher density residential areas is concentrated at the center of Block Island near the Old Harbor, New Harbor, and Block Island State Airport. The Export Cable and BITS Cable will make landfall at manholes located in the parking lot of Crescent Beach (also known as Fred Benson Town Beach) on Corn Neck Road and will be collocated in the same underground concrete duct bank under existing RIDOT roadway rights-of-way to the BIPCO property.

   The Town of New Shoreham manages land use and development on Block Island through the Town of New Shoreham Zoning Ordinance, adopted 1994, amended August 17, 2011. The Applicants obtained a special use permit and variance for pole height and setbacks from the Town of New Shoreham Zoning Board in April 2012 for the Block Island Substation and BIPCO Substation upgrades on the BIPCO property. A special use permit is not required for

the cable from the landfall at Crescent Beach to the BIPCO property. The Applicants obtained an option for an easement from the Town of New Shoreham for the cable landfall at Crescent Beach in August 2012.

The Scarborough Beach Alternative is located exclusively on, over, and under state-owned and controlled property and will be compatible with existing land uses. The cable landfall will occur on Scarborough State Beach, a state-owned recreational beach that currently supports public utility infrastructure (i.e., stormwater outflow facilities). The terrestrial cable will be located entirely within state-owned road rights-of-way through generally developed, commercial areas to an interconnection at the existing Wakefield Substation. The Switchyard will be located between major roadways on RIDOT property used for salt storage. DWBIT has received easements for the facilities on RIDEM and RIDOT property.

The BIWF and BITS are also subject to the coastal zoning program administered by the CRMC through the Rhode Island Coastal Resources Management Program. Through the RI Ocean SAMP, the CRMC also designated a subcategory for an offshore REZ southeast of Block Island. DWBI has sited the WTGs, the primary component of the BIWF, within the designated REZ. The CRMC voted to approve the applications for Category B Assents for the BIWF and BITS on May 13, 2014 and issued their written order on June 13, 2014. The CRMC issued a determination of consistency with Rhode Island's Coastal Zone Management Program on June 17, 2014.

The Applicants have minimized impacts on land uses from the BIWF and BITS by selecting cable routes along existing rights-of-way in areas of compatible use to the maximum extent practical, and conducting terrestrial construction activities outside of the peak tourist season. During construction, the Applicants have committed to avoid impacts on dune areas on Block Island with the use of a short-distance HDD during cable installation. The Applicants have committed to a long-distance HDD at Scarborough Beach, which will avoid direct impacts on the beach during cable installation. Residences along the cable routes and recreational users walking, jogging, or surfing during the spring months may experience some temporary disturbance from construction activities and noise; however, this will be minor and limited to the construction period only. No impacts to terrestrial land use are expected from routine operation and maintenance of the BIWF or BITS. Land-use disturbance associated with the eventual decommissioning of the onshore components of the BIWF on Block Island will involve comparable types of activities and will result in temporary disturbances that will be less than or equivalent to those associated with construction. The onshore components of the BITS will operate in perpetuity.

2. Marine Uses. The BIWF is located in the REZ. In assessing the natural resources and existing human uses present in state waters, the CRMC found that this area is the most suitable area for offshore renewable energy development in state waters.

   Commercial fishing, including ground fish, pelagic, and invertebrate fisheries, is an important economic activity within the state and federal waters off the coast of Rhode Island. Rhode Island has two major commercial fishing ports, Point Judith and Newport, as well as several smaller fishing ports throughout the state, including Block Island, used by both commercial and recreational fishermen (RI Ocean SAMP 2011). These Rhode Island fishing ports serve commercial fishermen and fishing vessels from Rhode Island and other states along the East Coast. Out-of-state vessels from as far away as North Carolina and Florida make use of the infrastructure present in the state to unload and sell fish (RI Ocean SAMP 2011).

   Construction of the BIWF will result in minor, temporary impacts on commercial fishing as a result of the temporary displacement of fishing activities from within the BIWF Project Area,

including the proposed temporary Work Area and Export Cable route. DWBI anticipates that construction of the BIWF will take place over a 13- to 15-week construction period, which will coincide with periods of active commercial and recreational fishing. To ensure the safety of the public, work crews, and equipment, DWBI will temporarily restrict access to the proposed BIWF Work Area during construction, requiring that both mobile (trawl and rod and reel) and fixed (gillnets and traps/pots) fisheries to temporarily relocate outside of the area. Data derived from the RI Ocean SAMP and NOAA Fishing Vessel Trip Reports (FVTRs) show that mobile and fixed gear activity within the BIWF Project Area as compared to other locations throughout the Rhode Island and Block Island Sounds is low. Along the BITS Cable route, these data show that mobile and fixed-gear fishing activities are also low with concentrations of activity in proximity to the proposed cable landfall location near Scarborough State Beach. Restrictions associated with the proposed BIWF and BITS construction areas will result in the temporary displacement of fishing activities. Impacts from this displacement are expected to be short-term and minor as the period of restricted access will be limited to construction, with no restrictions during operations. DWBI will not restrict fishing activity in the proposed construction vessel standby areas.

DWBI is funding a fisheries liaison to support communication with the local fishing community. Open dialog and coordination between DWBI and the local fishing industry during the planning and construction phase will assist in minimizing impacts. As required by the CRMC, the Applicants will fund a Fisheries Liaison Officer to support communications throughout the duration of offshore construction. In addition, DWBI will implement a communication plan during construction to inform the public and the fishing community of construction activities and vessel movement. The establishment of designated construction vessel traffic routes and construction standby areas will also assist in further minimizing unanticipated interactions with the commercial fishing industry. For these reasons, the construction of the BIWF is not anticipated to have a significant long-term effect to commercial fisheries.

Operation of the BIWF will result in the loss of 0.35 ac (0.15 ha) of potential mobile fishing ground and introduce a potential obstacle to traditional navigation routes. However, per CRMC requirements, DWBI has spaced the turbines to allow access both through and around the WTG Array, and does not propose any operational phase vessel exclusions within the Project Area. Additionally, DWBI has designed a cable burial depth that is sufficient to allow continued use of mobile gear in the Project Area. Routine maintenance of the BIWF will not restrict commercial or recreational fishing. For these reasons, operation of the BIWF is not anticipated to have a significant adverse effect to commercial fisheries traditionally known to occur in the Project Area.

It is possible that the WTGs will develop into areas of reef habitat as they become an established part of the marine environment and covered by algae and sessile invertebrates. It is likely that marine organisms will settle in and around the new WTG foundation structures as has been observed within the Gulf of Mexico and on the Pacific Coast around fixed oil rigs (BOEM 2010). The arrival of settled organisms on the WTGs will likely lead to increased densities of commercially targeted mobile species in the Project Area.

Decommissioning of the Project will involve comparable types of activities and will result in temporary disturbances and displacements that will be less than or equivalent to those associated with construction.

Impacts on commercial and recreational fishing and proposed mitigation measures associated with the construction of the BITS will be as described for the BIWF. No navigation exclusion areas will be implemented for any vessels along the proposed BITS route during

operations. The cable will be buried such that the operational depth below surface features will have a target depth of 6 ft (1.8 m). Two short crossings of existing cables will require cable laying on the seafloor and the installation of protective concrete mats and sand bags; however, these areas represent a minute area compared to the area available for trawl fishing in the Rhode Island Sound. Therefore, no impacts on commercial and recreational fishing during operation of the BITS are expected. No routine maintenance of the BITS submarine cable is planned. Unlike the BIWF the BITS is expected to remain in operation in perpetuity.

The US Navy Atlantic Fleet's Narragansett Bay Operating Area (OPAREA), a surface and subsurface exercise/operating area, extends approximately 100 nm (185.2 km) south and 220 nm (407.4 km) west off the coasts of Massachusetts, Rhode Island, and New York. Training exercises generally occur in deeper waters offshore. Submarines may remain in shallower portions of the Narragansett Bay OPAREA to prepare for formal voyages.

There are two restricted areas near the Project Area: a Torpedo Testing Area and a Mine Laying Area. The US Navy practice area used as a Torpedo Testing Area is a 2-nm (3.7-km) wide corridor that begins at the precautionary area at the approach to the Narragansett Bay and extends south within the Narragansett Traffic Separation Schemes (TSS) for approximately 11.5 nm (21.3 km). The Torpedo Testing Area is located within 1 nm (1.9 km) of BITS Alternative 1. The Naval Undersea Warfare Center in Newport oversees and directs use of this area as a torpedo range.

The Mine Laying Area is a 1-nm by 1.5-nm (1.9-km by 2.8-km) area located approximately 4 nm (7.4 km) off of Lands End in Newport and east of the Narragansett TSS just outside state waters. This area is located approximately 4 nm (7.4 km) east of BITS Alternative 1. The US Naval Base in Newport oversees and directs use of this area as a naval practice minefield.

The Torpedo Testing Area and Mine Laying Area are clearly marked on navigation charts and defined in navigation publications and LMNs. The BIWF and Export Cable are located more than 6 nm (11.1 km) from the Torpedo Testing Area and the Mine Laying Area and 0.06 nm (0.11 km) from the Narragansett Bay OPAREA at its closest point. Because the Naval Undersea Warfare Center and US Naval Base prohibit vessel navigation in these areas during training activities, the Applicants have considered them in Project planning and have sited Project facilities, construction and transit routes outside of these areas. Therefore, the construction, operation, and decommissioning of the BIWF and BITS is not expected to affect nor be affected by these areas.

Refer to Section 7.k for a discussion of marine navigation and to Section 7.m for marine recreational uses.

References:

RI Ocean SAMP (Rhode Island Ocean Special Area Management Plan). 2011. Rhode Island Coastal Resources Management Council. Approved May 4, 2011. Available online at http://seagrant.gso.uri.edu/oceansamp/documents.html.

BOEM. 2010. Artificial Reefs: Oases for Marine Life in the Gulf. http://www.gomr.boemre.gov/homepg/regulate/ environ/rigs-to-reefs/artificial-reefs.html.

k. Navigation:

1. Marine Navigation. There are two main shipping lanes within Rhode Island Sound: the charted approach to Narragansett Bay and the charted approach to Buzzards Bay. To prevent collisions, commercial ship traffic passing through the approaches to Narragansett Bay and Buzzards Bay is directed by TSS, consisting of shipping lanes, separation zones, and precautionary areas. Smaller commercial and recreation vessels that are not entering or departing Buzzards Bay and Narragansett Bay can be found throughout Block Island and Rhode Island Sounds. The inbound and outbound shipping lanes are 1-nm-wide (1.9-km-wide) and have a separation zone that is 2-nm-wide (3.7-km-wide). Precautionary areas mark the offshore and inshore limits of these approaches. The precautionary area at the offshore limit of the Narragansett TSS is adjacent to the Block Island REZ; no WTGs are located within the precautionary area. The BITS Cable route will be installed beneath the outbound shipping lane of the Narragansett TSS for approximately 8 nm (14.8 km).

   A Recommended Vessel Route runs east and west approximately 3 mi to 4 mi (4.8 km to 6.4 km) south of the Rhode Island coast for vessels transiting from Long Island Sound to Narragansett Bay or Buzzards Bay and the Cape Cod Canal. There is also a Recommended Vessel Route stretching from both the north ends of the outbound and inbound traffic lanes through the east passage of Narragansett Bay to the Conanicut Island. The Recommended Vessel Routes are safe, established routes to reduce the risk of grounding or conflict with recreational and fishing vessels. Additionally, multiple passenger ferries operate within the Block Island and Rhode Island Sounds. Ferry service is provided year-round to Block Island's Old Harbor located along the eastern side of the island.

   The volume of commercial traffic per 2009 Automatic Identification System (AIS) data obtained from the USCG is shown in Figure 14. The AIS data indicates that vessels currently operate on either side of the proposed Project Area and that the volume of vessel traffic increases from the outer edges of the southern-most Precautionary Area toward the center marked by Buoy "A." Vessels coming from the southwest approach the Precautionary Area in such a manner as to allow them to make up for the inbound (eastern) leg of the TSS while still in the Precautionary Area or to pass through the Precautionary Area enroute to the Buzzards Bay TSS.

   Conversely, vessels outbound from Narragansett Bay pass through a significant part of the Precautionary Area before altering course principally to the southwest or south enroute to their destination. On average, vessels equipped with AIS passed within 2 mi (3.2 km) of the Project Area once every 2 to 3 days in 2009. A smaller number of vessels traverse the area between Block Island Sound and the Project Area. These vessels are typically comprised of fishing vessels, yachts, tug/barge units, and recreational boats.

   Unlike commercial shipping traffic, recreational traffic routes are more difficult to predict, as these vessels are not bound by draft restrictions, Regulated Navigation Area (RNA) instructions, or other routing measures. However, as depicted in Figure 15, popular recreational boater cruising routes compiled in support of the RI Ocean SAMP completed in 2010 and confirmed by a 2010 survey of Massachusetts recreational boaters conducted by the Massachusetts Ocean Partnership indicate Block Island's New Harbor being a popular destination during the recreational boating season for boats from Narragansett Bay and points east. Old Harbor, on Block Island's east coast, is closest to the BIWF and accommodates recreational traffic from both Narragansett Bay and boats transiting from Buzzards Bay. The heaviest volume of boaters are likely to navigate in New Harbor both due to its larger size, its favorable position, and its local accommodations. Bluewater cruisers also pass near the

Project Area when operating coastwise to and from Chesapeake Bay and other points along the south shore of Long Island.

Project construction vessels are detailed in Table 4. The presence of these construction vessels will temporarily increase vessel traffic in the Project Area during the construction period; however, as evidenced by the AIS and recreational boating data presented in Figures 14 and 15, these vessels will not add significantly to the number of vessels currently operating in and around Rhode Island Sound.

Table 4. Vessel Types

Vessel Type	Activity	BIWF / BITS or BOTH
Construction		
Transportation Barge	Flat-topped material transportation barge with sufficient deck space to store and secure the wind farm foundation components.	BIWF
Towing Tug 1	80-ton bollard pull ocean going tug to tow the transportation barges with the foundation components.	BIWF
Towing Tug 2	60-ton bollard pull ocean going tug to tow the transportation barge with the foundation piles.	BIWF
Material Barge 1	Flat-topped material transportation barge with supporting equipment for the jet plow.	BIWF & BITS
Material Barge 2	Flat-topped material transportation barge to support cable lay operations.	BIWF & BITS
Derrick Barge	Derrick barge with approximately 1,000-ton crane and 8 anchors to keep position.	BIWF
Anchor Handling Tug	Ocean-going tug necessary for moving the derrick barge and positioning the barge anchors during installation of the foundations.	BIWF
Jack-up Transportation Barge	Flat-topped material barge with jack-up legs for the transportation of the WTG components.	BIWF
Jack-up Barge	Floating barge with jack-up legs and approximately 600-ton crane for installation of the WTGs.	BIWF
Cable-laying Barge	Floating barge with a dynamic positioning system, a turntable, a cable ramp, and a 200-ton crawler crane.	BIWF & BITS
Work Vessel	Floating barge with a 4-anchor mooring system and a crawler crane for construction of the cofferdams.	BIWF & BITS
Work Vessel Support Tug	60-ton bollard pull ocean-going tug to support and anchor out the work vessel.	BIWF & BITS
Crew Transport Vessel	Provides crew transfer to/from the work sites.	BIWF & BITS
Helicopter	Emergency air transport from work sites.	BIWF & BITS
Support Vessel	Single-hull vessel to host the environmental and marine mammal observers.	BIWF & BITS
O&M		
Crew Boat	Provides transport of crew for O&M.	BIWF & BITS
Work Vessel	Will support wind farm inspection and repair.	BIWF & BITS

Vessel Type	Activity	BIWF / BITS or BOTH
Work Vessel Support Tug	Will support the wind farm inspection and repair work vessel.	BIWF & BITS
Jack-up Barge	Will support the repair of the WTGs as necessary.	BIWF
Jack-up Vessel Support Tug	Will support jack-up barge during WTG repair, as necessary.	BIWF
Helicopter	Emergency air transport for O&M crew.	BIWF & BITS

Construction activities could potentially stop due to weather constraints or other limits necessitating work stoppage, including wind and wave conditions. In such an event, construction vessels could temporarily locate to one of the designated standby areas for the Project construction. Construction vessels may also wait in these areas under normal weather conditions until they are needed at the construction site. Vessels in this area will sail at slow speed in circles awaiting the call to mobilize to the construction site. The Applicants sited these areas outside of Recommended Vessel Routes, TSS, and areas of high-density vessel traffic. In addition, the boundaries of these areas will be communicated to the marine vessel public through LNMs and the Applicants' website(s). The Applicants have stated that they will not impose any restrictions on other vessels transiting through these standby areas or the rest of the Project Area during construction. The short-term nature of the construction impacts and the proposed mitigation measures would result in a temporary and minor impact on marine traffic and transportation during construction of the BIWF and BITS.

The Corps has consulted the USCG regarding navigational safety issues for both the BIWF and BITS. DWBI submitted to the Corps and USCG a detailed navigational risk assessment for the BIWF, included as Appendix U of the BIWF/BITS ER. The assessment was completed in accordance with USCG guidance for Offshore Renewable Energy Installations (OREIs) contained in Navigation Vessel Inspection Circular (NVIC) 02-07, and through consultation with the USCG and marine transportation stakeholders. Based on the results of this assessment, and the requirement of the USCG to have each of the WTGs marked and lit, the BIWF is not anticipated to increase the risk of collision between vessels or the risk of allision between a vessel and a WTG during operation. Risks of collision or allision during Project installation and future BIWF and BITS decommissioning activities are also considered low. DWBI has stated that the BIWF WTGs will require approximately 3 to 5 days of planned maintenance per year. The jacket foundations will be inspected annually. WTG maintenance will be conducted from a standard vessel and is not expected to interfere with marine navigation. As stated previously, the Applicants will be required to implement communication measures to identify the location and position of the Project construction, support, and cable-lay vessels throughout the installation and eventual decommissioning processes for the marine portions of the BIWF (see also Section 11.f for special conditions regarding marine navigation and safety).

The BITS will be a submarine cable and, as a result, will not have any impacts on marine transportation and navigation during the operational phase.

2. Aviation. On April 2, 2012, DWBI submitted to the FAA a Notice of Proposed Construction or Alteration for each of the five WTGs to seek a determination about operation of the BIWF. DWBI has developed a proposed FAA marking and lighting scheme for the WTGs in accordance with FAA Advisory Circular AC 7460-1K.

The FAA conducted their aeronautical review of the WTGs and issued a Notice of Presumed Hazard on September 21, 2012. The FAA issued public notice of aeronautical study on October 26, 2012. No comments were received. The FAA issued Determinations of No Hazard to Air Navigation for each of the five WTGs on April 2, 2014. DWBI will submit a notice to the FAA for any cranes that require a temporary notice during the construction of the BIWF and the BITS.

l. Shore Erosion and Accretion

The Applicants will obtain permits from RIDEM under the Rhode Island Pollutant Discharge Elimination System (RIPDES) that will include best management practice measures for erosion control during construction of terrestrial facilities. Implementation of these measures will assure impacts from erosion or accretion processes along the shore and in tidal waters are avoided and/or minimized to the extent possible.

The Corps anticipates that cable landfall installation, offshore construction, operation, and decommissioning will not significantly contribute to erosion or accretion processes along the shore or in tidal waters. The Export and BITS Cables will be buried beneath Crescent Beach on Block Island in their own respective cable conduits installed via a short distance HDD. At Scarborough State Beach, the BITS Cable will also be buried beneath the beach in a conduit installed via long distance HDD.

As described in Section 1, cable landfall construction on Block Island would require excavation of temporary transition area trenches to support the launching of the jet plow from the beach. Excavated sediments will be stored according to grain size within the proposed temporary Work Area on the beach and will be returned to the trench upon completion of cable installation. To address the potential for long-term erosion, the Applicants will match existing soil stratigraphy and density. A sediment transport analysis of jet-plow operations in the nearshore/tidal zone conducted by the Applicants indicated that impacts on the surrounding environment from installation of the Export Cable off the beach will be short-term and minor, producing sediment concentrations that are of the same order of magnitude and between the average and storm conditions known to occur at Crescent Beach.

Decommissioning of the BIWF Export Cable will involve cutting the cable above the mudline and abandoning the cable in place. Therefore, there will be no disturbances to Crescent Beach that would result in increased erosion or accretion on the beach.

DWBIT has designed the BITS Cable to operate in perpetuity. The cable can be removed at the end of its useful life by pulling it through the conduit, which will not result in impacts on the shoreline conditions at Crescent Beach on Block Island and Scarborough State Beach in Narragansett.

m. Recreation

Recreational activities in Rhode Island Sound and Block Island consist primarily of boating, sailing, fishing, diving, and wildlife viewing, as well as seaside travel destinations and shore-based activities such as surfing or beach-going.

Recreational boating activity varies seasonally with peak season occurring between May and October. Rhode Island-based buoy races typically occur between the months of June and September in nearshore waters and within the same general area each year. Annual buoy races in the Project Area include the Block Island Race Week, which occurs each year in June. Distance races take place in both nearshore and offshore and occur annually or biannually during the months of May through October. Given the importance of sailboat races to the Rhode Island economy, the CRMC has designated two areas of heavy recreational boating and sailboat racing

as an Area of Particular Concern (APC) for protection under the Coastal Zone Management Act (CZMA). The WTGs are outside of these designated areas, which are located to the northwest of Block Island.

Marine recreational fishing, including both recreational anglers and recreational fishing aboard private boats and party/charter boats, is a major recreational activity for Rhode Islanders, as well as a major tourist attraction that brings many visitors from out-of-state. Recreational fishing occurs year-round, but is most intensive from April through November. According to data presented in the RI Ocean SAMP (2012), recreational fishing activities are concentrated in state waters surrounding Block Island and Point Judith.

Historic shipwrecks, interesting benthic communities, and sharks are the focus of boat-based scuba diving in the waters off of Rhode Island. The RI Ocean SAMP identified 12 important dive sites in the waters of Rhode Island Sound. Of these sites, two are located in proximity to the BIWF and BITS Project Area. Shipwreck "Idene" is located outside of the BIWF Work Area to the southeast. Shipwreck "Miss Jennifer" is located less than 0.6 mi (0.9 km) southeast of the BITS Alternative 1. Neither of these shipwrecks are protected cultural resources under federal statutes such as the NHPA and the Abandoned Shipwreck Act. Shark cage diving areas are located outside of the Project Area in waters approximately 11 mi (17.7 km) south and southeast of the BIWF.

Onshore construction of the BIWF and BITS and associated substation facilities, as well as the eventual decommissioning of the BIWF onshore facilities, may cause temporary disruptions to terrestrial recreational activities such as wildlife viewing, seaside travel, and beach-going. These disruptions would result from the temporary increased traffic within the Project Area from construction activities along and within existing roadways and the use of local roadways by construction vehicles and associated personnel. However, given the Applicants commitment to complete onshore construction outside of the peak tourist season, these impacts are expected to be short-term and minor.

The Export Cable and BITS Cable will be buried beneath the beaches and within developed roads on Block Island, Narragansett, and South Kingstown with the exception of a 0.2-mi span on the BIPCO property and a 45-foot span along the bridge across Trims Pond. No maintenance is expected during routine operation. Therefore, operation of the BIWF and BITS will have no long-term effect to land-based recreational activities.

Construction of the BIWF and BITS could temporarily affect marine-based recreational activities such as boating, sailboat racing, wildlife viewing and recreational fishing within the proposed construction area for the WTGs and along the cable corridors. However, given the approximate five-month marine construction period for the BIWF and the BITS, these impacts are expected to be short-term and minor. In addition, construction within the Project Area will only affect discrete portions of the Rhode Island Sound and will not preclude recreational activities from occurring in the surrounding portions of the Sound. As described previously, the Applicants will implement communication plans during construction to inform the public and associated businesses of construction activities and vessel movement. In addition, the Applicants will coordinate the construction schedule with local sailboat race organizations and local municipalities to avoid disruptions to these popular sailing events.

During operation of the BIWF, DWBI has not proposed to implement navigation exclusion areas for any recreational boating vessels. Therefore, tourism and recreational activities are expected to continue and no adverse impacts on recreation and tourism are expected. The five WTGs will be visible from beaches along the southeast coast of Block Island. Refer to Section 7.c for a discussion of visual impacts. Because the BITS will be buried beneath the seafloor, operation of

the BITS is not anticipated to affect recreational boating activities. Should the BITS Cable be removed at the end of its useful life, it would be done so with a jet plow and the impacts would be similar to construction.

n. Water Supply and Conservation

The Project is not expected to adversely affect surface waters or groundwater supplies.

Block Island was designated as a sole source aquifer in 1983 by the EPA. This designation means that all of Block Island is considered a continuous aquifer bounded by the Atlantic Ocean that serves as a source of drinking water for local residents with no existing alternative drinking water source or combination of sources that could potentially provide 50 percent or more of the drinking water, nor are there any reasonably available alternative in the future. Several publicly and privately operated wells provide water to the Town of New Shoreham. Wellhead protection areas have been established throughout Block Island to protect groundwater quality. The BIPCO property and the terrestrial portion of the BIWF Export Cable and BITS route up to the bridge between Trims Pond and Harbor Pond are located within the 1,200-ac (486-ha) Harbor Area Wellhead Protection Area. This protection area encompasses 29 wells located in or near the downtown commercial district in east-central Block Island that are maintained by 25 water suppliers (Rhode Island Department of Health 2003).

The Applicants will define the depth of the water table and tidal influence along the terrestrial route during final engineering to determine if groundwater will have to be managed during construction. If dewatering is determined to be necessary in the final engineering design, a dewatering plan will be developed in accordance to regulatory erosion control and discharge requirements and submitted to agencies for review and approval prior to construction. Dewatering activities would be temporary and the volumes of water withdrawn would be minimal compared to the volume of Block Island's sole source aquifer. It is highly unlikely that hazardous materials will be introduced to the aquifer during construction activities. The Applicants will have spill prevention and response plans in place during construction.

Public drinking water for Narragansett is supplied by municipal sources that do not rely on local groundwater withdrawal.

Reference:

Rhode Island Department of Health. 2003. Block Island Drinking Water Assessment Results. Available online at http://www.blockislandwater.org/PDF%20files/Source%20Water%20Assessment.pdf.

o. Water Quality

Impacts on marine water quality resulting from the construction of the Project would be minor and temporary, consisting of sediment disturbance from pile driving, cable laying, and the positioning of jack-up barges and vessel anchors. Jet plowing, HDD techniques, and use of DP vessels to install the Project cables will minimize sediment disturbance and alteration. Sediments disturbed in the cable-laying process are not expected to contain contaminants based on site-specific sediment sampling results off of Block Island and Narragansett. Routine maintenance of the BIWF would be minor and temporary, consisting of sediment disturbance from vessel anchors. No impacts on water quality are expected from routine operation of the BITS. During decommissioning activities, impacts on water quality would only be associated with the removal of the BIWF WTGs and foundations, as well as the BITS Cable. The BIWF marine cables will be abandoned in place. Decommissioning would involve comparable types of equipment and would result in water quality impacts equivalent to those associated with construction (e.g., sediment disturbance from the positioning of jack-up barges, vessel anchors, and jet plow).

The BIPCO property is supplied by potable water from an on-site well. In the past, over 69 underground storage tanks (USTs) have been located on the BIPCO property; the site has been investigated for contamination from the release of fuel products and has undergone remediation. Recently completed soil and groundwater investigations indicate that the contaminant levels at the site do not exceed applicable RIDEM criteria.

In support of onshore construction activities, the Applicants will develop and implement stormwater pollution prevention best management practices and erosion control measures. The Applicants will submit Stormwater Pollution Prevention Plans (SWPPP) and erosion control plans to RIDEM for review and approval under the RIPDES prior to construction. All construction and operation vessels will be required to comply with regulatory requirements related to the prevention and control of spills and discharges in accordance with a Project-specific Spill Control and Response Plan. In the event that drilling fluids are used, DWBIT will develop an HDD Contingency Plan for the inadvertent releases of drilling fluid prior to HDD construction to minimize the risk associated with a potential frac-out. As a result of the implementation of these measures, impacts on surface water quality are not expected.

WQCs were issued by RIDEM for the BIWF and BITS on May 7, 2014.

p. Energy Needs

The Project will have a positive effect to energy needs. The Project will provide the state of Rhode Island with an alternative energy facility that utilizes the wind resources in waters offshore of Block Island and employs a technology that is currently available, technically feasible, and economically viable to deliver renewable energy to the residents of Block Island and the Rhode Island mainland.

As stated in the Project purpose and need, the state of Rhode Island has expressed a need for renewable energy. Rhode Island established a renewable energy standard (RES) in 2004 that requires investor-owned utilities, including TNEC, to supply 16 percent of their retail electricity sales from renewable energy sources by 2019 (RIGL § 39-26-1 et seq.). The PUC adopted regulations for implementing the RES in 2007, which included a compliance requirement that began at 3 percent by the end of 2007. In 2009, Rhode Island also adopted a separate long-term contracting standard that requires electric distribution companies to solicit proposals and enter into long-term contracts for capacity, energy and attributes from new renewable energy facilities for up to 90 MW by 2014. The Project will sell its output to a regulated utility, TNEC, which will help to meet these requirements.

In 2006, the state of Rhode Island initiated RIWINDS to study the State's wind resource as a potential source of domestic energy supply. The goal of the program was to find means to supply 15 percent of the State's energy needs with wind-generated energy by 2012. Based on the state annualized average electricity demand of 1,000 MW, this goal amounted to 150 MW of energy, or approximately 400 MW of installed nameplate wind energy capacity due to the intermittent nature of wind energy generation. In 2007, the Rhode Island Office of Energy Resources (OER) commissioned a Phase I Siting Study to assess the feasibility of meeting the goal of supplying the 15 percent of the State's energy needs by constructing wind energy facilities in state and federal waters off the coast of Rhode Island. The final report concluded that 95 percent of Rhode Island's wind energy resource is located offshore (78 percent of which is located in state waters) and the quantity of existing wind resources is sufficient to meet the goal of supplying 15 percent of the State's total energy needs (ATM 2007).

The implementation of the study recommendations began in 2008, when the OER, the RIEDC, and the Rhode Island Department of Administration issued a request for proposal (RFP) for the development of an offshore wind farm in Rhode Island. On September 25, 2008, the State

selected Deepwater Wind Rhode Island, LLC as its preferred developer under the RFP, and on January 2, 2009, the state of Rhode Island and Deepwater Wind Rhode Island, LLC entered into a JDA to develop the Project. The JDA includes the requirement for the construction and operation of a demonstration-scale offshore wind energy facility located in state waters that interconnects with and supplies energy to BIPCO on Block Island and Rhode Island mainland. The proposed Project, which will sell power to TNEC under a 20-year PPA, meets these requirements of the JDA.

Reference:

ATM. 2007. RI Winds Summary Report, prepared by Applied Technology and Management, Inc. for the RI Office of Energy Resources, Providence, RI, September 2007. Available online at http://www.energy.ri.gov/documents/renewable/RIWINDS_RANKING.pdf.

q. Safety

Offshore wind energy is a non-emitting, non-combustible, waste-free energy source that poses minimal risks to public health and safety. The Applicants have stated their commitment to carrying out business activities with a primary focus on health, safety, and well-being of employees, contractors, third parties, and the general public. The Applicants will develop communication plans during construction to inform the general public and commercial and recreational fishermen, mariners, and recreational boaters, in particular, of construction activities and vessel movements. Communication will be facilitated through maintaining a Project website and submitting LNMs and vessel float plans, as appropriate, to the USCG.

Potential health and safety issues considered elsewhere in this document relevant to construction and operation of an offshore wind energy project and associated facilities include public access, hazardous materials, non-routine events, and electric and magnetic fields.

1. Public Access. The WTG design provides a "haven of safe refuge" for boaters who may experience an emergency in the vicinity of the WTG Array. The presence of a platform on the tower will allow for the individual or individuals on board a stricken vessel to get out of the water and wait for rescue, and the platform structure itself could serve as a mooring for a drifting vessel. Access to the interior of the turbine will be restricted by the locked door at the base of the tower. The Inter-Array Cable and submarine portions of the Export Cable will be submerged at sufficient depths to prevent public access. Where burial depths of less than 4 ft (1.2 m) are achieved, additional protection such as concrete matting or rock piles may be installed. The Block Island Substation and the Dillon's Corner Switchyard will be located within a fenced, locked area that will prevent public access to the switchyards.

2. Hazardous Materials. As standard practice, marine construction vessels operate under oil spill prevention and response plans that comply with USCG requirements relating to prevention and control of oil spills and the discharge of wastes. While the WTGs themselves will not contain substantial amounts of lubricating oil or other hazardous materials that may affect water quality if released into the marine environment, the Applicants will prepare Spill Prevention and Response Plans to address the limited low-quantity of such materials. As a result, operation of the BIWF is not anticipated to result in any public health or safety impacts due to release of hazardous materials.

   The BITS submarine cable will not consist of any hazardous materials. The switchyards and other land-based facilities associated with the BITS will not involve the use of any EPA-reportable quantities of hazardous materials. The switchyard transformers will each contain 4,000 gallons (15,142 liters) or less of mineral insulating transformer oil and will be mounted on a concrete foundation with a concrete oil containment pit. The pit will be able to hold

120 percent of the oil contained in the isolation transformer. Given the implementation of the spill prevention measures, operation of the BITS is not expected to result in the release of materials that would affect public health and safety.

3. Non-Routine Events. Non-routine events include foundation or WTG failure and/or collapse, lightning strike and fires, and ice throw from the WTG blades.

   Failure of the foundation or WTG collapse is extremely unlikely. In addition, there are no permanent structures or facilities near the WTGs that would be affected, and the likelihood of a vessel transiting underneath a WTG at the time of collapse is extremely low. The WTGs will not operate in extreme wind conditions. The blades will automatically pitch out of the wind if wind speeds exceed 67 mph (30 m/s). The WTGs will be designed in accordance with engineering standards for offshore wind turbines (IEC 61400 1/3), which require load case simulations with extreme gust conditions in combination with grid loss. Further, the Project Area is located in an area of low seismic hazard potential. Therefore, seismic activity is unlikely to result in WTG collapse either from fluidization of sediments or stress on the structure resulting from ground motion.

   The WTG design includes lightning and fire prevention and protection measures. Lightning rods will be installed on the external bracket of the nacelle to protect the aviation and navigation obstruction lighting. Secondary induced voltages will be suppressed by surge arrestors. Cables from the obstruction lights will be routed in metallic hoses and in structural metallic parts for lightning protection. The interior components of the nacelle will be protected by the canopy housing the machinery. The WTGs will be equipped with control sensors, including fire and smoke alarms. Firefighting equipment will be available in each WTG in accordance with the applicable regulations.

   The WTGs have also been designed to minimize the effects of icing conditions in the Project Area. The pitch and shape of the blades, the blade coating material, and color have all been designed to impede the buildup of ice and snow both during operations and when WTGs are immobile. In addition, the supervisory control and data acquisition (SCADA) monitoring system and turbine control management system are designed to detect the buildup of ice and/or snow on the WTG and shut down operations as necessary.

   DWBI will prepare an emergency response plan that addresses non-routine events and emergencies relevant during both construction and operation of the BIWF. The emergency response plan outlines the procedures for Project communication and coordination with the USCG and other agencies in the event of an emergency in the area surrounding the WTG Array. Responsibilities will be reviewed and approved by agencies prior to construction.

   The switchyards associated with the BITS on Block Island and Narragansett will be designed to include fire protection measures. Heat and smoke detectors will be installed within the switchgear and O&M buildings. The switchyards will be designed to have separation of the oil-filled equipment from other equipment by an adequate separation distance or fire walls if sufficient space is not available.

4. Electric and Magnetic Fields. The Applicants conducted an EMF analysis for the terrestrial portions of the Export Cable and BITS on Block Island. Because the Export Cable and BITS Cable are collocated on Block Island, the EMF analysis modeled both cables together. The analysis modeled magnetic fields for the cable under Crescent Beach for the short-distance HDD cable burial depth, the buried segment along the majority of the cable route, the aboveground segment along the bridge between Trims Pond and Harbor Pond, and the aboveground segment on the BIPCO property. The EMF analyses for BIWF and BITS

marine and terrestrial cables indicate that the modeled magnetic and electric fields that would result from the Project are orders of magnitude less than the recommended exposure limits. Given the low EMF levels that would be produced by the facilities on Block Island and Narragansett, the BITS is not anticipated to result in significant impacts on human health and safety as a result of EMF exposure.

r. Food and Fiber Production

Not applicable. The Project will have no effect on food and fiber production. Potential impacts and mitigation measures for commercial fishing are discussed in Section 7.j.

s. Mineral Needs

Not applicable. The Project will have no effect to mineral needs.

t. Considerations of Property Ownership

As stated in the Corps regulatory guidance, authorization of work or structures by a Corps permit does not convey any property rights, either in real estate or material, or any exclusive privileges (33 CFR 320.4(g)(6)). DWBI will obtain a lease from the CRMC for use of submerged lands in state territorial waters for the BIWF. DWBIT will obtain a lease from the CRMC for use of submerged lands in state territorial waters and a Right-of-Way Grant from BOEM for use of submerged lands in federal territorial waters. In Narragansett, DWBIT has obtained the appropriate easements from the state of Rhode Island for facilities on RIDOT and RIDEM property.

8. OTHER LAWS, POLICIES AND EFFECTS.

a. Endangered Species Act

Consultation with the USFWS and NOAA Office of Protected Species has been ongoing regarding the Project since 2009. Upon receiving the applications for the BIWF and BITS, the Corps submitted, with a letter dated July 5, 2012, the Applicants BIWF/BITS ER, which included the Biological Assessment for the Project, to the USFWS and NOAA Office of Protected Species for review under Section 7 of the ESA.

In a letter to USFWS dated June 26, 2013, the Corps determined that the installation and operation of the BIWF and BITS is not likely to adversely affect the threatened, endangered, and candidate species that may occur in and around the Project site. In their comments to the Corps dated July 31, 2013, USFWS concurred that "the proposed Block Island Wind Farm and Block Island Transmission System projects are not likely to adversely affect the American burying beetle, roseate tern, piping plover or red knot due to insignificant (should not reach the scale where take occurs) and discountable (extremely unlikely to occur) effects." The Corps subsequently sent a letter to USFWS dated November 25, 2013 with a determination that the Scarborough Beach Alternative is not likely to adversely affect the threatened, endangered, and candidate species that may occur in and around the Project site. In their comments dated April 16, 2014 to the Corps, the USFWS concurred with the Corps determination.

In a letter to the NOAA Office of Protected Species dated July 5, 2012, the Corps stated that they had made a preliminary determination that the BIWF and BITS may affect but are not likely to adversely affect terrestrial and marine protected species. Via a letter dated July 8, 2013, the Corps requested formal consultation with NOAA pursuant to Section 7 of the ESA. On January 30, 2014, NOAA concluded their consultation under Section 7 of the ESA for the BIWF and BITS. The Biological Opinion concluded that the proposed Project may adversely affect but is not likely to jeopardize the continued existence of ESA-listed North Atlantic right, humpback, or fin whales or any distinct population segments of Atlantic sturgeon. The Biological Opinion also included an incidental take exemption for loggerhead, leatherback, Kemp's ridley, and green sea

turtles, as well as the Atlantic sturgeon, due to exposure to disturbing levels of noise from impact pile driving. NOAA has indicated that they will amend the Biological Opinion to include the incidental take exception for the ESA-listed North Atlantic right, humpback, or fin whales, as appropriate, following the issuance of the IHA. The terms and conditions of the NOAA Biological Opinion to support the mitigation and monitoring of effects to ESA-listed marine species have been included as Special Conditions as specified in Section 11.f).

b. Essential Fish Habitat

Upon receiving the applications for the BIWF and BITS, the Corps submitted the Applicants' BIWF/BITS ER with a letter to NMFS dated July 5, 2012. The July 5, 2012 transmittal included an EFH assessment for the Project. In a letter to the Corps dated July 12, 2013, NMFS provided their conclusions and recommendations regarding the impact of the Project on EFH. The Corps sent a copy of the Public Notice for the Scarborough Beach Alternative to NMFS on November 26, 2013. NMFS responded with a letter dated December 23, 2013 requesting more information, which the Corps provided. In a letter to the Corps dated March 17, 2014, NMFS provided their conclusions and recommendations regarding impact of the Scarborough Beach Alternative on EFH. The Corps has considered the recommendations provided by NMFS and has established Special Conditions as specified in Section 11.f.

c. Historic Properties

The Corps, as Lead Federal Agency, initiated the Section 106 process and engaged the SHPOs and THPOs that may have an interest in the Project Area. In October 2011, the Corps sent letters to the Rhode Island SHPO (RIHPHC), Massachusetts SHPO, New York SHPO, Connecticut SHPO, Narragansett THPO, and Wampanoag of Gay Head (Aquinnah) Wampanoag THPO, as well as the National Park Service (NPS) to determine interest in participating in the Section 106 process for the BIWF and BITS. Based on the received responses, the Corps, as Lead Federal Agency, continued to consult with the RIHPHC, the Narragansett THPO, the Wampanoag THPO, and the NPS under Section 106 of the NHPA.

The Applicants have also facilitated consultation with the RIHPHC, the Narragansett THPO, and the Wampanoag THPO since 2009 to support survey protocol development and design of the Project in a way that avoids and minimizes impacts on cultural resources to the extent practicable.

The RIHPHC and the THPOs have reviewed the BIWF and BITS Phase I Marine and Terrestrial Archaeological Reports, as well as the Phase II Terrestrial Archaeological Survey Report on Block Island in accordance with Section 106 of the NHPA. In letters to the Corps dated November 7, 2012 and August 15, 2012, the RIHPHC reconfirmed the adequacy of the surveys conducted and concurred with the conclusions and recommendations for avoidance and/or mitigation presented in the reports.

In a letter to the Corps dated May 28, 2013, the RIHPHC concluded that the BIWF and BITS will result in adverse effects to significant cultural resources and in the absence of prudent and feasible alternatives that would avoid these effects, it would be appropriate to develop a MOA to stipulate measures to mitigate them. In response to the Scarborough Beach modification, RIHPHC provided the Corps with a letter dated October 28, 2013, which determined no adverse effect on aboveground historic properties and, consistent with the May 28, 2013 letter, a need to continue consultation on the terrestrial portion of the BITS through Narragansett. The parties entered in MOAs for the BIWF and BITS in June, 2014. The BIWF MOA was executed by the Corps, the RI HPHC, the NIT, and DWBI. The BITS MOA was executed by the Corps, BOEM, the RI HPHC, the NIT, and DWBIT. The NPS participated in Section 106 consultation and were invited to sign the BIWF MOA. The NPS stated that their signature was not required on the MOA. The Aquinnah participated in consultation and were invited to sign the BIWF and BITS MOAs, however they were unresponsive and ultimately did not sign the MOAs.

In a letter to the Corps dated November 21, 2013 the Advisory Council for Historic Preservation declined to participate in the consultation to resolve adverse effects. In a letter to the Corps dated July 21, 2014 the Advisory Council for Historic Preservation advised the Corps to include the Southeast Lighthouse Foundation and the Block Island Historical Society as consulting parties in the consultation regarding the BIWF MOA. On July 23, 2014 the Corps invited the Southeast Lighthouse Foundation and the Block Island Historical Society to be consulting parties to resolve adverse effects associated with the BIWF and requested comments on the BIWF MOA. Counsel to the Southeast Lighthouse Foundation and the Block Island Historical Society, Cultural Heritage Partners, PLLC provided comments on August 6, 2014 which included some objection to the Section 106 process. In an August 29, 2014 letter Counsel to the Southeast Lighthouse Foundation and the Block Island Historical Society stated that they had reached a mutually acceptable agreement with Deepwater Wind, they withdrew their earlier objections to the Section 106 process and declined to be signatories to the MOA.

This concludes the Corps and the Cooperating Agencies responsibility under Section 106 of the NHPA.

d. Cumulative & Secondary Impacts

CEQ implementing NEPA regulations (40 CFR 1508.7) define cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions." The geographic extent of the cumulative impacts discussion and the determination of which "past, present, and reasonably foreseeable future actions" to include in the analysis are determined by each agency, as appropriate, based on the nature of the action.

The proposed BIWF WTG Array is located within the REZ, which was designated as a suitable site within Rhode Island state waters for offshore renewable energy development. There are currently no other renewable energy projects or other offshore development projects existing or proposed within the REZ. Moreover, the Corps has not identified any resources with the potential to be cumulatively affected by the Project in combination with other known or reasonably foreseeable activities in the proposed Project Area. Therefore, no cumulative impacts are anticipated.

Additionally, BOEM awarded leases in September 2013 to Deepwater Wind New England, LLC resulting from competitive auction for two sites for an offshore renewable energy project within the Rhode Island/Massachusetts Wind Energy Area (WEA). No project plans have been submitted to BOEM subsequent to lease issuance. Additionally, any proposed project would be located within open water at a sufficient distance from the BIWF such that it is outside of the Action Area of the BIWF and BITS. Therefore, there are no reasonably foreseeable future projects that can be cumulatively considered.

Additionally, the Corps reviewed the Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report (2013). The report stated that warming of Earth's climate system is unequivocal, and that it is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century. The Corps is not aware of any methods to correlate exclusively the CO_2 emissions resulting from the proposed Project to any specific impact on global warming; however, studies such as the IPCC report support the premise that CO_2 emissions from the proposed Project, together with global greenhouse gas emissions, would likely result in a cumulative impact on global warming. The IPCC Report indicates that changes in many physical and biological systems, such as increases in global temperatures, more frequent heat waves, rising sea levels, coastal flooding, loss of wildlife habitat, spread of infectious disease, and other potential environmental impacts are linked to changes in the climate system, and that some changes could be irreversible.

Although the proposed Project would result in some greenhouse gas emissions (during construction) and related climate change when combined with other projects globally, greenhouse gas emissions from the proposed Project would be minimal. The energy produced by the proposed Project would be free of both greenhouse gas emissions and other air pollutants. Greenhouse gas emissions from the proposed Project (e.g., emissions related to construction and transportation) would be relatively small compared to the 8,026 million tons of CO_2-equivalent greenhouse gas emitted in the United States in 2007, and the 54 billion tons of CO_2-equivalent anthropogenic greenhouse gas emitted globally in 2004 (EIA 2007). However, emissions from the proposed action in combination with past and future emissions from all other sources would contribute incrementally to the climate change impacts described above.

Further, under Section 404(b)(1) Guidelines, effects to an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material are referred to as secondary effects. No effects of the authorized discharge of fill material are expected to occur on the site beyond the specific location of the fill, with the possible exception of minor and temporary sediment resuspension and turbidity impacts in the localized area along the submarine cable routes.

Overall, the Corps considered the combined impacts and benefits from development of both the BIWF and BITS in our analysis of both applications. The Corps has determined that the Project will not result in significant cumulative or secondary impacts.

References:

Intergovernmental Panel on Climate Change (IPCC). 2013. Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Energy Information Administration, Report No. DOE/EIA-0573 (2007). Available at: http://www.desmogblog.com/sites/beta.desmogblog.com/files/DOE-2007-greenhouse-gas-emissions-united-states.pdf

e. State Water Quality Certification under Section 401 of the Clean Water Act
The State WQCs were issued for the BIWF and BITS on May 7, 2014.

f. Coastal Zone Management Consistency/Permit
The BIWF/BITS ER submitted with the Corps application included a statement of consistency with the Rhode Island Coastal Resources Management Program. The Applicants submitted applications to the CRMC on September 20, 2012 for a Category B Assents for the BIWF and BITS. The CRMC voted to approve the applications for Category B Assents for the BIWF and BITS on May 13, 2014 and issued their written order on June 13, 2014. The CRMC issued a determination of consistency with Rhode Island's Coastal Zone Management Program on June 17, 2014.

g. Other Authorizations
The Applicants obtained a special use permit and variance for pole height and setbacks from the Town of New Shoreham Zoning Board in April 2012 for the Block Island Substation and BIPCO Substation upgrades on the BIPCO property. A special use permit is not required for the cable from the landfall at Crescent Beach to the BIPCO property.

h. Significant Issues of Overriding National Importance
None.

9. COMPENSATION AND OTHER MITIGATION ACTIONS

Compensatory mitigation is not required for this Project.

10. GENERAL EVALUATION CRITERIA UNDER THE PUBLIC INTEREST REVIEW

The Corps of Engineers considered the following within this document:

a. The Relative Extent of the Public and Private Need for the Proposed Structure or Work
The overall purpose of the BIWF and BITS is to respond to the State of Rhode Island's expressed need for offshore wind energy as established by the RIWINDS, codified by Rhode Island law (RIGL §§ 39-26-1 et seq and 39-26.1-7), and as defined by the JDA.

b. Are there unresolved conflicts as to resource use? If so, are there reasonable and practicable alternative locations and/or methods to accomplish the objectives of the proposed action?
Refer to Section 5; Alternatives Analysis.

c. The extent and permanence of the beneficial and/or detrimental effects, which the proposed work is likely to have on the public, and private uses to which the area is suited.
Refer to Section 7; Public Interest Review.

11. DETERMINATIONS

Determinations for the Block Island Wind Farm and Transmission System

a. Section 176(c) of the Clean Air Act General Conformity Rule Review
EPA's general conformity regulations located at 40 CFR 93, Subpart B, contain requirements intended to ensure that licensing, permitting, and other actions undertaken by federal agencies conform with any applicable state implementation plan. These requirements are applicable to criteria pollutants or precursors in nonattainment and maintenance areas when emissions are predicted to exceed the applicability levels shown in 40 CFR 93.153.

EPA designated all of Rhode Island as a moderate ozone nonattainment area for the 1997 ozone standard (see 69 FR 23857; 4/30/2004). One implication of this nonattainment designation was that General Conformity requirements became applicable to certain projects within the state. Since 2004, air quality has improved in Rhode Island and in October of 2010, EPA published a "clean data determination" for the state with regard to the 1997 ozone standard (see 75 FR 64949). Note that a clean data determination relieves states of some, but not all of their air quality planning obligations, and one such obligation that remains is the General Conformity requirement.

More recently, in the spring of 2012, EPA established designations for a tightened ozone standard that was promulgated in 2008. These designations were published in the *Federal Register* on May 21, 2012 (77 FR 30088). Importantly, Rhode Island was designated as unclassifiable / attainment for this new ozone standard, and General Conformity only applies to nonattainment or maintenance areas. However, General Conformity requirements remain in place in Rhode Island due to the state's nonattainment designation for the 1997 ozone standard until such time as EPA revokes that standard.

On June 6, 2013, EPA published a notice of proposed rulemaking that articulated EPA's intention to revoke the 1997 ozone standard upon finalization of the June 6, 2013 proposal (78 FR 34178). The public comment period on EPA's proposed rule ended on August 5, 2013, and EPA estimates that a final rule will be promulgated in 2014. Since construction activity on the Project is not

scheduled to begin until sometime in 2015, it does not currently appear likely that General Conformity will be applicable to this Project. However, in the event that EPA is delayed in promulgating a final rule revoking the 1997 ozone standard, a conformity analysis will need to be developed for the Project and made available for public review and comment. Based on e-mail correspondence between the EPA and the Corps dated June 13, 2013, if EPA has not revoked the 1997 ozone standard by September 1, 2014, the Corps will develop a conformity analysis that evaluates the Project's emissions of ozone precursors (nitrogen oxides and volatile organic compounds). The analysis would identify any necessary mitigation measures, such as the purchase of emissions offsets. General Conformity would be completed, and all mitigation measures to satisfy conformity would be in place before construction is started.

b. Relevant Presidential Executive Orders

1. EO 13175, Consultation with Indian Tribes, Alaska Natives, and Native Hawaiians. Refer to Section 7.f and Section 8.c.

2. EO 11988, Floodplain Management. Refer to Section 7.h and 7.i.

3. EO 12898, Environmental Justice. In accordance with Title III of the Civil Rights Act of 1964 and Executive Order 12898, it has been determined that the project would not directly or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin nor would it have a disproportionate effect to minority or low-income communities.

4. EO 13112, Invasive Species. The evaluation above included invasive species concerns in the analysis of impacts at the Project site. Through special conditions, the Permittee will be required to control the introduction and spread of exotic species.

5. EO 13212 and 13302, Energy Supply and Availability. The review was expedited and/or other actions were taken to the extent permitted by law and regulation to accelerate completion of this energy-related (including pipeline safety) Project while maintaining safety, public health, and environmental protections.

c. Finding of No Significant Impact (FONSI)

Having reviewed the information provided by the Applicants and all interested parties and an assessment of the environmental impacts, the Corps find that this permit action will not have a significant impact on the quality of the human environment. Under the CEQ NEPA regulations, NEPA significance is a concept dependent upon context and intensity (40 CFR 1508.27). In a site-specific project like this, significance is measured by the impacts felt at a local level, rather than a nationwide or regional scale. The CEQ regulations identify a number of factors to measure the intensity of impact. A review of these NEPA intensity factors, as discussed below, with consideration to the environmental assessment and agency consultations reveals, that the proposed action will not result in a significant impact, neither beneficial nor adverse, to the human environment. Therefore, an EIS is not required.

1. **Impacts on public health or safety:** Offshore wind energy is a non-emitting, non-combustible, waste-free energy source that poses minimal risks to public health and safety. The submarine cables and terrestrial 34.5-kV cable, which is comparable in size to common distribution cables, is not anticipated to have appreciable impacts on human health and safety. As discussed in Section 7.q, public access, hazardous materials, non-routine events (including intentionally destructive acts), and electric and magnetic fields have been considered in the design and impact assessment for the BIWF and BITS. Based on the results of these analyses

and the communication and safety plans to be implemented by the Applicants during construction and operation, there are not expected to be significant impacts on public health or safety from the construction, operation, and decommissioning of the BIWF or the BITS.

2. **Unique characteristics:** The impacts on waters of the United States are discussed above, and do not constitute a significant impact. The BIWF will be located within the designated REZ. There are no unique characteristics of the geographic area, such as designated parklands, wild and scenic rivers, or prime farmlands that will be affected by the BIWF or the BITS. The permit has been conditioned to further minimize the short-term and long-term impacts.

3. **Controversy:** The concept of controversy in NEPA significance analysis is not simply whether there is opposition to the proposal, but whether there is a substantial technical or scientific dispute over the degree of the effects to the human environment. The potential impacts of both onshore and offshore wind energy projects have been studied for several years in the United States and were considered in the comprehensive RI Ocean SAMP in their designation of the REZ as a suitable location for an offshore wind energy project. Other submarine and terrestrial cables similar to the BITS have been installed in the northeastern United States. Several assessments have been completed for this particular demonstration scale offshore wind project and associated transmission line and have been reviewed by experts at appropriate resource agencies. There are no objections from federal or state resource agencies regarding the Corps assessment of the environmental impacts of the BIWF or the BITS. As such, this Project does not represent a NEPA controversy.

4. **Uncertain impacts:** As stated previously, the potential impacts of both onshore and offshore wind energy projects have been studied for several years in the United States and were considered in the comprehensive RI Ocean SAMP in their designation of the REZ as a suitable location for an offshore wind energy project. Other submarine and terrestrial cables similar to the BITS have been installed in the northeastern United States. Several assessments have been completed for this particular demonstration scale offshore wind project and associated transmission line and have been reviewed by experts at appropriate resource agencies. Additionally, the BIWF represents a demonstration scale project whose operation would further the understanding of potential impacts from wind energy projects for larger scale development.

5. **Precedent for future actions:** The decision here is based upon the facts of the proposed demonstration scale project and does not set precedent for future Corps permit decisions, which, like this decision, will be based upon their own merits and their own facts.

6. **Cumulative significance:** As discussed in Section 8.d, the Corps considered the combined impacts and benefits from development of both the BIWF and BITS in our analysis of both applications. The Corps has also considered other past, present, and reasonable foreseeable future actions and has not identified any resources with the potential to be cumulatively affected by the BIWF and BITS in combination with other known or reasonably foreseeable activities in the proposed Project Area.

7. **Historic resources:** As discussed in Sections 7.f and 8.c, the Corps and Cooperating Agencies have executed individual MOAs for the BIWF and BITS that require DWBI and DWBIT to take a number of measures prior to the construction of the BIWF and BITS to protect historic properties, including measures to mitigate visual impacts and development of a data recovery plan. The MOAs were executed in June, 2014.

8. **Endangered species:** As discussed in Sections 7.g and 8.a, based on the nature of the impacts, the special conditions of this permit, and the mitigation agreed to by the Applicants, the NMFS agrees that neither the BIWF nor the BITS will jeopardize the continued existence of the Kemp's ridley, green sea turtles, leatherback or the Northeast Atlantic distinct population segment (DPS) of loggerhead sea turtles, North Atlantic right, humpback, or fin whales, or the Gulf of Mexico, New York Bight, Chesapeake Bay, Carolina or South Atlantic DPSs of Atlantic sturgeon. Likewise, the USFWS agrees that neither the BIWF nor the BITS will jeopardize the continued existence of the American burying beetle, roseate tern, piping plover, or red knot.

9. **Potential violation of state or federal law:** In addition to the WQCs already obtained for the BIWF and BITS, the Applicants will obtain all necessary federal, state, and local approvals necessary for the protection of the environment prior to the start of activities requiring authorization.

d. Compliance with 404(b)(1) Guidelines

Having completed the evaluation in Section 6, the Corps has determined that the proposed discharge complies with the 404(b)(1) guidelines.

e. Public Interest Determination

As discussed in Section 7, the Corps has considered all factors relevant to this proposal, including combined effects. Potential factors included conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general, the needs and welfare of the people. After weighing the favorable and unfavorable effects as discussed in this document, the Corps find that issuance of a Corps permit is not contrary to the public interest and that a Corps permit shall be issued.

f. Special Conditions and Rationale for Inclusion

1) The following special conditions were included in the Section 401 State Water Quality Certification: see attached WQCs issued for the BIWF and BITS by RIDEM. The special condition requirements contained in the WQCs issued for the Project are part of the Corps permit.

2) The following special conditions will be included in the BIWF permit (as noted to ensure the project is not contrary to the public interest [33 CFR 320.4(r)], to ensure the project complies with the Section 404(b)(1) Guidelines [40 CFR 230.10(d)], and/or at the permittee's request [33 CFR 325.4(b)]:

    1. The special condition requirements contained in the Section 401 State Water Quality Certification issued by RIDEM for the BIWF project are made a part of the Corps permit.

    2. All Block Island Wind Farm (BIWF) work is to be completed in accordance with the Permittee's September 2012 applications and subsequent modifications, and their Environmental Report and subsequent modifications.

    3. The Permittee shall ensure that a copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a

part of any and all contracts and subcontracts for work which affects areas of Corps of Engineers jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for work. If the permit is issued after the construction specifications, but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. If the permit is issued after receipt of bids or quotes, the entire permit shall be included in the contract or sub-contract as a change order. The term "entire permit" includes permit amendments. Although the Permittee may assign various aspects of the work to different contractors or subcontractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or subcontract shall require or allow unauthorized work in areas of Corps jurisdiction.

4. The Permittee shall complete and return the enclosed Compliance Certification Form to the Corps within one month after the completion of the authorized work.

5. Adequate sedimentation and erosion control devices, such as geotextile silt fences or other devices capable of filtering sediments, shall be installed and properly maintained to minimize impacts on wetlands and/or waters during construction. These devices must be removed after soils disturbed by construction activities are stabilized by revegetation or other means. The sediment collected by these devices must be periodically removed and placed in uplands, in a manner that will prevent its erosion and transport to wetlands and/or waters.

6. All areas of wetlands and/or waters, which are disturbed during construction, except those authorized herein for permanent impact, shall be restored to their approximate original elevation (but not higher) and condition by careful protection, and/or removal and replacement, of existing soil and vegetation. In addition, if upland clearing, grubbing, or other construction activity results in, or may result in, soil erosion with transport and deposition into a wetland or waterway, devices such as geotextile silt fences, sediment trenches, etc., shall be installed and properly maintained to minimize such impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices must also be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.

7. Except where stated otherwise, reports, drawings, correspondence and any other submittals required by this permit shall be marked with the words "Permit No. 2009-789" and shall be submitted to: PATS Branch - Regulatory Division, Corps of Engineers, New England District, 696 Virginia Road, Concord, MA 01742-2751. Documents which are not marked and addressed in this manner may not reach their intended destination and do not comply with the requirements of this permit. Requirements for immediate notification to the Corps shall be done by telephone to (978) 318-8338.

Essential Fish Habitat:

8. The Permittee shall provide their vessel operators with maps of sensitive hard bottom habitat in the project area, as well as a proposed anchoring plan that minimizes impacts on the hard bottom habitat to the greatest extent practicable. These plans shall be provided for all anchoring activity, including construction, maintenance, and decommissioning.

9. Prior to the start of construction, a monitoring plan shall be prepared to assess any

hard bottom habitat impacts that cannot be avoided. The monitoring plan shall provide an assessment of impacts on the hard bottom habitat, as well as a plan for assessing recovery time for this sensitive habitat. The plan shall also include a means of recording observations of any increased coverage of invasive species in the impacted hard bottom area. The monitoring plan and subsequent reports shall be provided to the Corps and NMFS for review and comment.

10. Reports on the post-construction monitoring of cable installation shall be provided to the Corps and NMFS for review. Mitigation may be required if areas along the cable route do not recover or fill in naturally, as stated in the BIWF/BITS ER.

11. Results of scour monitoring at the WTGs shall be provided to the Corps and NMFS for review. Additional consultation will be required if scour protection is deemed necessary.

12. Noise mitigating measures shall be used during construction, such as soft-start procedures, to ensure fish species have the opportunity to evacuate the area prior to pile driving activity. A plan outlining noise mitigation procedures shall be provided to the Corps and NMFS prior to construction. Resource agencies shall be notified within 24 hours if any evidence of a fish kill during construction activity is observed.

13. Monitoring for noise levels during construction and operation shall be conducted to verify the acoustic models and provide more accurate information on the area of impact. Noise monitoring reports shall be provided to the Corps and NMFS.

14. Deepwater Wind Block Island (DWBI) shall conduct two years of pre-construction trawl surveys and three years of post-construction surveys in accordance with the BIWF Trawl Survey Plan dated April 2012, as amended, to monitor fisheries resources in the project area. Monthly and annual survey reports shall be provided to the Corps and NMFS. A final summary report evaluating any potential changes in fish diversity, distribution and abundance shall be provided to the Corps and NMFS once trawl survey monitoring is complete.

Avian and Bat:

15. DWBI will use anti-perching devices and design measures to avoid attracting avifauna to the wind turbine generators.

16. DWBI must use red FAA lights on each wind turbine generator to reduce the potential for attracting migrant avian species to the wind farm.

17. DWBI shall complete avian and bat surveys and monitoring in accordance with Avian and Bat Post-Construction Monitoring Plan dated February 28, 2014.

Cultural Resources:

18. DWBI shall comply with the MOA executed in June, 2014 that was signed by the Army Corps of Engineers (Corps), Rhode Island State Historic Preservation Office (SHPO), DWBI, and the Narragansett Indian Tribal Historic Preservation Office.

Air Navigation:

19. DWBI shall comply with the Determinations of No Hazard to Air Navigation (2012-WTE-1893-OE through 2012-WTE-1897-OE) issued by the FAA for the WTGs.

Marine Navigation:

20. DWBI shall ensure that the BIWF is designed, positioned, arranged and operated in such a way as to maintain maritime navigation safety as determined by the USCG.

21. Design Conditions:

a. All WTGs, shall be marked in accordance with applicable federal law and regulation. Application shall be made to Commander (dpw-l), First Coast Guard District, to establish private aids to navigation for each WTG, and approval for all private aids to navigation shall be obtained before construction of the wind farm begins.

(1) Additionally, DWBI shall:

a) Provide signage on the four sides of the wind turbine structures warning vessels that the air draft of the turbine blades is less than 71 ft. (Or whatever distance the final design provides for blade clearance.)

b) Ensure that cable routes and wind turbines are depicted on appropriate government produced and commercially available nautical charts; and

c) Provide mariner information sheets on the project website with details on location of the turbines and specifics such as blade clearance above sea level.

b. All WTG rotors (blade assemblies) shall be equipped with control mechanisms that can be operated from the control center of the wind farm.

(1) The WTG control mechanisms shall enable control room operators to shut down any or all of the WTGs within two minutes of initiating shutdown procedures.

(2) Shutdown(s) may be ordered by the USCG. Normally, USCG-ordered shut downs will be limited to those WTGs in the immediate vicinity of an emergency and for as short a period as is safely practicable under the circumstances, as determined by the USCG.

c. Safety lines and mooring attachments (for securing vessels), and access ladders for use in emergencies shall be placed on each WTG. Plans for the design and placement of safety lines and access ladders shall be submitted for USCG review and approval.

d. Radar: Potential interference on navigational radar, if any, is site specific and a function of many factors including turbine size, layout of the wind farm, number of turbines, construction material(s), topographical features, and types of radars impacted.

(1) Before beginning construction or operation of the wind farm, DWBI shall submit to the Corps of Engineers and the USCG a researched analysis specific to the BIWF proposal concerning whether or not the WTGs produce radar reflections, blind spots, shadow areas, or other effects that could adversely impact safety of navigation.

(2) DWBI shall provide the USCG with recommended measures to mitigate the adverse impact to vessel radars, if any, resulting from the WTGs it proposes. If mitigation measures are deemed necessary for navigation safety by the USCG, those mitigations will be funded by DWBI.

e. A detailed submarine cable system burial plan shall be submitted that depicts precise location and burial depths of the entire cable system. This plan shall be reviewed by the USCG and approved by the Corps of Engineers before construction of any component of the Offshore Renewable Energy Installation (OREI) begins.

f. A detailed tower design shall be reviewed by the USCG and accepted by the Corps of Engineers before construction of any component of the OREl begins.

g. Should there be, at any time, any change or modification in the design of the wind farm that may impact navigation safety (including, but not limited to a change in number, size, or location of WTGs or a change in construction materials or construction method), written application must be made by DWBI to the Corps of Engineers:

(1) Justifying the need for the change or modification.

(2) Explaining how the change or modification is expected to impact navigation safety

h. DWBI must receive written approval from the Corps of Engineers before proceeding with any change or modification for which it has submitted a written application as required in paragraph g.(1) (special condition 21.) above.

22. Planning Conditions:

a. Control Center: Prior to construction of the wind farm, DWBI will provide for USCG review and approval, a plan describing the standard operating procedures, staffing, communications capabilities, and monitoring capabilities of the wind farm control center. The plan shall include, but not be limited to, the following topics:

(1) Standard Operating Procedures: Method for establishing and testing WTG rotor shutdown; methods) for notifying the USCG of mariners in distress or potential/actual search and rescue (SAR) incidents; methods) for notifying the USCG of any events or incidents that may impact maritime safety or security.

(2) Staffing: Number of personnel intended to staff the control center; hours of operation; job qualification requirements; initial, on-the-job, and refresher training requirements, etc.

(3) Communications: Capabilities to be maintained by the control center to communicate with the USCG; and mariners within and in the vicinity of the wind farm.

(4) Monitoring: Capabilities to be maintained by the control center to continuously monitor each of the WTGs, including aids to navigation and marine traffic within and in the vicinity of the wind farm.

b. Worksite Construction: No construction work shall commence at the site (i.e., on or under the water), without prior review and approval by the USCG of a plan to be submitted by DWBI that describes the schedule and process for erecting each WTG, including all planned mitigations to be implemented to minimize any adverse impacts to navigation while construction is ongoing. Appropriate Notice to Mariners submissions will accompany the plan.

Oil Spill Prevention and Response Plan: DWBI will submit for USCG review and approval an Oil Spill Prevention and Response Plan as required by applicable federal regulations to address the risks posed by oil in each of the nacelles, and oil transfers as part of the normal operations and maintenance of the OREI.

23. Reporting Conditions:

a. Upon commencing construction of the wind farm and no later than the first calendar day of each succeeding month, DWBI shall provide a written report to the USCG which shall include:

(1) The current construction status of the Project.

(2) Changes to the construction schedule or process described in the plan required by paragraph 25.b above.

(3) A description of any complaints received (either written or oral) by boaters, fishers, commercial vessel operators, or other mariners regarding impacts on navigation safety allegedly caused by construction boats, barges, or other equipment. Describe any remedial action taken in response to complaints received.

(4) Copies of any correspondence received by DWBI from other federal, state, or local agencies that mention or address navigation safety issues.

b. No later than 30 days prior to 1 January, 1 April, 1 July, and 1 October of each year in which any WTG is erected, DWBI shall provide the USCG with its planned WTG maintenance schedule for each respective quarter. Appropriate Notice to Mariners submissions will accompany each maintenance schedule.

24. To ensure sufficient opportunity for the public to receive information directly from the owners/operators of the wind farm, DWBI agrees to attend periodic meetings of the Rhode Island Port Safety Forum to brief the forum on the status of construction and operations, and on any problems or issues encountered with respect to navigation safety.

25. The wind farm construction and operation, including the control center and its operators, and all plans and policies related thereto, shall be subject to regular review and inspection by the USCG on at least an annual basis, or more frequently if circumstances dictate.

Marine Mammals and Sea Turtles:

26. Exclusion and Monitoring Zones: Exclusion and monitoring zones will be established around acoustically active Project components (i.e., impact pile driving and DP thruster use for cable-lay operations). These zones will be established to monitor for ESA-listed species of sea turtles and whales that may enter the Project Area and to adjust Project operations accordingly to prevent exposure of these animals to potentially injurious levels

of underwater noise. Exclusion and monitoring zones are not being established for Atlantic sturgeon because this species occurs only under the water surface and visual observers will not be able to detect the presence of Atlantic sturgeon in the Project Area and no remote sensing technology that could detect Atlantic sturgeon is feasible for deployment in the area.

a. Impact Pile Driving of WTG Foundations - Prior to the onset of pile driving, when the 200-kilojoule (kJ) impact hammer is in use, an initial 200-m radius exclusion zone will be established around each jacket foundation. In addition, an initial monitoring zone extending 3.6 km (radius) from the pile will be monitored for each pile during impact pile driving activities utilizing the 200-kJ impact pile driving hammer. During the final phases of pile installation, when a 600-kJ impact hammer will be used, the exclusion zone will be expanded to the maximum radial distance of approximately 600 m. The monitoring zone will be expanded to the maximum radial distance of approximately 7 km. These distances are expected to equate to where 180 dBRMS and 160 dBRMS isopleth extend. DWBI will follow ramp-up and shutdown procedures in accordance with these monitoring zones (see below for further details).

b. Dynamic Position (DP) Vessel during Cable Installation – DP vessel use during cable installation will not produce sound levels at 180 dBRMS beyond 1 m from the source and thus, an exclusion zone will not be established. A monitoring zone, based on the extent to the 160 dBRMS isopleth, will be established around the DP vessel. The monitoring zone will extend an estimated 21 m from the source (i.e., DP vessel). All marine mammal sightings, including those beyond the 160 dBRMS isopleth will be recorded.

27. Field Verification of Monitoring and Exclusion Zones:

a. Impact Pile Driving of WTG Foundations – Field verification of the initial 200-m radius exclusion zone and the 3.6-km radius monitoring zone for the 200-kJ impact pile driving hammer, as well as the 600-m radius exclusion zone and 7-km radius monitoring zone for 600-kJ impact pile driving hammer, will be conducted. Acoustic measurements will include the driving of the last half (deepest pile segment) for any given open-water pile and will include measurements from two reference locations at two water depths (a depth at mid-water and a depth at approximately 1 m above the seafloor). If the field measurements determine that the actual 180 dBRMS and 160 dBRMS zones of influence are less than or extend beyond the proposed exclusion zone and monitoring zone radii, a new zone(s) will be established accordingly. The Corps and NMFS will be notified within 24 hours whenever any new exclusion and/or monitoring zone are established by DWBI that extends beyond the initially proposed radii. Implementation of the revised zone(s) smaller than the proposed radii will be contingent upon Corps and NMFS review and approval. In the event that a smaller zone(s) is determined to be appropriate, DWBI will continue to use the originally proposed zone(s) until agency approval is given.

b. DP Vessel during Cable Installation – Field verification of the preliminary 21-m radius monitoring zone (i.e., that the 160 dBRMS isopleth does not extend beyond 21-m) associated with DP vessel thruster use during cable installation will be performed using acoustic measurements from two reference locations at

two water depths (a depth at mid-water and a depth at approximately 1-m above the seafloor). As necessary, the monitoring zone will be modified and implemented as described for impact pile driving).

28. Protected Species Observers:

a. All observations for whales and sea turtles in the exclusion and monitoring zones will be performed by NMFS-approved protected species observers (PSO). Observer qualifications will include direct field experience on a marine mammal/sea turtle observation vessel and/or aerial surveys in the Atlantic Ocean/Gulf of Mexico. It is anticipated a minimum of two PSOs will be stationed aboard each noise producing construction support vessel (e.g., derrick barge, jack-up barge, and cable-lay vessel). To increase the potential for detection, given the distance of the monitoring zone associated with the impact pile driving, at least two additional PSOs will be stationed aboard an observation vessel dedicated to patrolling the monitoring zone while continuously searching for the presence of ESA listed species (i.e., whales and sea turtles; in the offshore marine environment, visual surface detection of Atlantic sturgeon is not feasible). Each PSO will monitor 360 degrees of the field of vision. Each PSO will follow the specified monitoring period for each of the following construction activities:

   i. Impact Pile Driving of WTG Foundations – The PSOs will begin observation of the monitoring zone for at least 30 minutes prior to the soft-start of impact pile driving (see below for further details). Use of pile driving equipment will not begin until the associated exclusion zone is clear of all ESA-listed whales and sea turtles for at least 30 minutes. Initial monitoring of the exclusion and monitoring zones prior to soft-start will be conducted with the assistance of night vision equipment to account for dark conditions at or just prior to dawn. In addition, soft-start of construction equipment, as described below, will not be initiated if the monitoring zone cannot be adequately monitored (i.e., obscured by fog, inclement weather) for a 30-minute period. If a soft-start has been initiated before the onset of inclement weather, activities may continue through these periods if deemed necessary to ensure the safety and integrity of the Project. Observation of both the exclusion and monitoring zones will continue throughout the construction activity and will end approximately 30 minutes after use of noise-producing equipment stops operation.

   ii. DP Vessel during Cable Installation – PSOs stationed on the DP vessel will begin observation of the monitoring zone as the vessel initially leaves the dock. Observations of the monitoring zone will continue throughout the construction activity and will end after the DP vessel has returned to dock.

b. For each of the two construction activities (impact pile driving and DP thruster use during cable installation), PSOs, using binoculars, will estimate distances to whales and sea turtles either visually, using laser range finders, or by using reticle binoculars during daylight hours. It is important to note that all pile driving activity will occur only during daylight hours. As cable-laying activities will operate 24 hours a day, during night operations, night vision binoculars will

be used. If higher vantage points (greater than 25 ft) are available, distances can be measured using inclinometers. Position data will be recorded using hand-held or vessel global positioning system (GPS) units for each sighting, vessel position change, and any environmental change.

c. For monitoring established exclusion and monitoring zones, each PSO stationed on or in proximity to the noise-producing vessel or location will scan the surrounding area for visual indication of whale and sea turtle presence that may enter the zones. Observations will take place from the highest available vantage point on the associated operational platform (e.g., support vessel, barge or tug; estimated to be over 20 or more feet above the waterline). General 360-degree scanning will occur during the monitoring periods, and target scanning by the PSO will occur when alerted of the presence of a whale or sea turtle.

d. Data on all observations will be recorded based on standard PSO collection requirements. This will include dates and locations of construction operations; time of observation, location and weather; details of whale and sea turtle sightings (e.g., species, age classification [if known], numbers, behavior); and details of any observed behavioral disturbances or injury/mortality. In addition, prior to initiation of construction work, all crew members on barges, tugs and support vessels, will undergo environmental training, a component of which will focus on the procedures for sighting and protection of whales and sea turtles. A briefing will also be conducted between the construction supervisors and crews, the PSOs and DWBI. The purpose of the briefing will be to establish responsibilities of each party, define the chains of command, discuss communication procedures, provide an overview of monitoring purposes, and review operational procedures. The DWBI Construction Compliance Managers (or other authorized individual) will have the authority to stop or delay impact pile driving activities, if deemed necessary. New personnel will be briefed as they join the work in progress.

29. Ramp-up/Soft-Start Procedures: A ramp-up (also known as a soft-start) will be used for noise-producing construction equipment capable of adjusting energy levels (i.e., pile driving operations). The DP vessel thrusters will be engaged from the time the vessel leaves the dock. Therefore, there is no opportunity to engage in a ramp-up procedure.

Impact Pile Driving of the WTG Foundations: The ramp-up procedure for noise-producing equipment utilized during impact pile driving of the WTG foundations will not be initiated if the monitoring zone cannot be adequately monitored (i.e., obscured by fog, inclement weather, poor lighting conditions) for a 30-minute period. If a soft-start has been initiated before the onset of inclement weather, activities may continue through these periods if deemed necessary to ensure the safety and integrity of the Project. A ramp-up will be used at the beginning of each pile segment during impact pile driving in order to provide additional protection to Atlantic sturgeon, whales and sea turtles near the Project Area by allowing them to vacate the area prior to the commencement of pile driving activities. The ramp-up procedures require an initial set of three strikes from the impact hammer at 40 percent energy with a one minute waiting period between subsequent three-strike sets. The procedure will be repeated two additional times. If whales or sea turtles are sighted within the impact pile driving monitoring zone prior to or during the soft-start, activities will be delayed until the animal(s) has moved outside

the monitoring zone and no whales or sea turtles are sighted for a period of 30 minutes.

30. Shutdown Procedures: The monitoring zone around the noise-producing activities (impact pile driving and DP thruster use during cable installation) will be monitored, as previously described, by PSOs for the presence of whales and sea turtles before, during and after any noise-producing activity. PSOs will work in coordination with DWBI's Construction Compliance Managers (or other authorized individual) to stop or delay any construction activity, if deemed necessary. The following outlines the shutdown procedures:

a. Impact Pile Driving of WTG Foundations – For impact pile driving, from an engineering standpoint, any significant stoppage of driving progress will allow time for displaced sediments along the piling surface areas to consolidate and bind. Attempts to restart the driving of a stopped piling may be unsuccessful and create a situation where a piling is permanently bound in a partially driven position. In the event that a whale or sea turtle is observed within or approaching the monitoring zone during impact pile driving, PSOs will immediately report the sighting to the on-site Construction Compliance Manager (or other authorized individual). Upon this notification, the hammer energy will be reduced by 50 percent to a "ramp-up" level. This reduction in hammer energy will effectively reduce the potential for exposure of whales, sea turtles, and Atlantic sturgeon to sound energy, proportional to the reduction in force; however, established exclusion and monitoring zones will remain constant for monitoring purposes. By maintaining impact pile driving at a reduced energy level, momentum in piling penetration can be maintained minimizing risk to both Project integrity and to whales, Atlantic sturgeon, and sea turtles.

b. After decreasing impact pile driving energy, PSOs will continue to monitor whale and/or sea turtle behavior and determine if the animal(s) is moving towards or away from the exclusion zone. If the animal(s) continues to move towards the sound source, then impact piling operations will be halted prior to the animal entering the exclusion zone. Ramp-up procedures for impact pile driving may be initiated when PSOs report that the monitoring zone has remained clear of whales and/or sea turtles for a minimum of 30 minutes since the last sighting.

31. Pile Driving - Time of Day Restrictions: Impact pile driving for jacket foundation installation will occur during daylight hours starting approximately 30 minutes after dawn and ending 30 minutes prior to dusk unless a situation arises where ceasing the pile driving activity would compromise safety (both human health and environmental) and/or the integrity of the Project. If a soft-start has been initiated prior to the onset of inclement weather (e.g., fog, severe rain events), the pile driving of that segment may be completed. No new pile driving activities will be initiated until 30 minutes after dawn or after the inclement weather has passed.

32. Reporting: DWBI will provide the following reports during construction activities:

a. DWBI will contact the Corps and NMFS at least 24 hours prior to the commencement of construction activities and again within 24 hours of the completion of the activity.

b. DWBI will contact the Corps and NMFS within 24 hours of establishing any exclusion and/or monitoring zone. Within seven days of establishing exclusion and/or monitoring zones, DWBI will provide a report to the Corps and NMFS detailing the field-verification measurements. This report will include the following information: a detailed account of the levels, durations, and spectral characteristics of the impact pile driving sounds, DP thruster use, and the peak, RMS, and energy levels of the sound pulses and their durations as a function of distance, water depth, and tidal cycle.

c. DWBI must notify Corps and NMFS within 24 hours of receiving any field monitoring results which indicate that any exclusion or monitoring zones should be modified (i.e., due to in-field sound monitoring suggesting that model results were too big or too small). No changes will be made to the exclusion or monitoring zones without written (e-mail) approval from the Corps and NMFS.

d. Any observed behavioral reactions (e.g., animals departing the area) or injury or mortality to any marine mammals, Atlantic sturgeon, or sea turtles must be reported to the Corps and NMFS within 24 hours of observation. If any sturgeon are observed, these instances will also be reported to the Corps and NMFS (incidental.take@noaa.gov) within 24 hours.

e. A final technical report will be provided to the Corps and NMFS within 120 days after completion of the construction activities. This report must provide full documentation of methods and monitoring protocols (including verification of the sound levels actually produced within the exclusion and monitoring zones), summarizes the data recorded during monitoring, and comparing these values to the estimates of listed marine mammals and sea turtles that were expected to be exposed to disturbing levels of noise during construction activities, and provides an interpretation of the results and effectiveness of all monitoring tasks.

33. Strike Avoidance: All vessels associated with the construction, operation, maintenance and repair, and decommissioning of the BIWF will adhere to NMFS guidelines for marine mammal ship strike avoidance (see (http://www.nmfs.noaa.gov/pr/pdfs/education/viewing_northeast.pdf), including maintaining a distance of at least 500 yards from right whales, at least 100 ft from all other whales, and having dedicated lookouts and/or protected species observers posted on all vessels who will communicate with the captain to ensure that all measures to avoid whales are taken.

PSOs will be placed on vessels with noise-producing equipment (e.g., vessels with the pile driver and the DP vessels) and vessels assigned to actively observe the Project's established exclusion and monitoring zones through construction. Other vessels will have a dedicated lookout to watch for whales and sea turtles and to communicate with the captain.

34. Geophysical Surveys Mitigation and Monitoring: DWBI will use the following measures during all geophysical surveys (i.e., multi-beam sonar and sub-bottom profiler [chirp]):

a. **Implementation of Ramp-Up:** At the start of each survey day, instruments that have the capability of running at variable power levels and operate at a frequency detectable by ESA-listed species will initially be operated at low-levels, then gradually increased to minimum necessary power requirements for quality data collection. This allows any listed species capable of detecting this noise to depart the area before full-power surveying commences. Surveys will not commence (i.e., ramp-up) when the exclusion zone cannot be effectively monitored.

b. **Establishment of Exclusion Zone:** Whenever multi-beam sonar or the chirp is in use, a 300-m radius exclusion zone (from the source) will be established around the operating vessel or the towed survey device. The sounds produced by this equipment cannot be perceived by sea turtles or Atlantic sturgeon because the frequency is too high. Therefore, the exclusion zone will be maintained for listed whales. For example, if a sound source is towed 30 m behind the survey vessel, the monitored area from the vessel will be out to 330 m (or 300 m from the source). The 300-m exclusion zone encompasses the 160 dBRMS isopleth, which for either geophysical survey device, is expected to occur within 150 m or less from the operating device.

c. **Visual Monitoring of the Exclusion Zones:** The exclusion zone will be monitored by a trained Environmental Compliance Monitor who will keep vigilant watch for the presence of marine mammals within the exclusion zone. The exclusion zone will be monitored for 30 minutes prior to the ramp-up of sound sources. If the exclusion zone is obscured by fog or poor lighting conditions, surveying utilizing noise-producing equipment will not be initiated until the entire exclusion zone is visible for the 30-minute period. If marine mammals are observed within the 300-m safety exclusion zones during 30-minute period and before the ramp-up begins, surveying utilizing noise-producing equipment will be delayed until they move out of the area.

   The Environmental Compliance Monitor assigned to the survey vessel, as well as all individuals onboard the survey vessel responsible for navigation duties, will receive training on marine mammal and sea turtle sighting and reporting and vessel strike avoidance measures. The training course will be modeled after a NMFS-approved marine mammal and sea turtle training program. The training will include details on the federal laws and regulations for protected species (ship strike information, migratory routes, and seasonal abundance), as well as training on species identification.

   All sightings of NMFS-listed species will be recorded on an established NMFS-approved log sheet by the Environmental Compliance Monitor. The following data will be recorded:

   i. Dates and location of operations;
   ii. Weather and sea-state conditions;
   iii. Time of observation;
   iv. Approximate location (latitude and longitude) at the time of the sighting;
   v. Details of sighting (species, numbers, behavior);
   vi. General direction and distance of sighting from the vessel;

vii. Activity of the vessels at the time of sighting; and
viii. Action taken by the Environmental Compliance Monitor.

All observation data will be provided to NMFS within 60 days of the completion of surveys. In addition, during all survey operations DWBI will report all sightings of ESA-listed species, regardless of condition, to NMFS (incidental.take@noaa.gov) within 24 hours of the observation and record as much information as possible (e.g., species, size, decomposition state, obvious injuries etc.).

d. **Shut Down:** If a listed whale is spotted within or transiting towards the exclusion zone when equipment is operating that can be heard by that individual (i.e., the chirp), an immediate shutdown of the equipment will occur. Subsequent restart or ramp-up of equipment will occur only after the whale has cleared the safety exclusion zone.

Sea Turtles and Atlantic Sturgeon:

35. All endangered species observers contracted by DWBI must be approved by the Corps and NMFS. DWBI shall provide the Corps, and the Corps shall transmit to NMFS, the names and resumes of all endangered species monitors to be employed at the Project site at least 30 days prior to the start of WTG construction. No observer shall work at the Project site without written approval of NMFS. If during Project construction or DP vessel operations, additional endangered species monitors are necessary, DWBI shall provide those names and resumes, and the Corps shall transmit those names and resumes to NMFS for approval at least 10 days prior to the date that they are expected to start work at the site.

36. Designated exclusion zones for all noise-producing activities must be monitored by NMFS-approved observers. The exclusion zone is considered that area ensonified by injurious levels (i.e., underwater noise levels greater than or equal to 180 dBRMS). Monitoring shall be as follows:

a. **Impact Pile Driving Operations:** Observers must begin monitoring the exclusion zone at least 60 minutes prior to the initiation of soft-start pile driving. Full energy pile driving must not begin until the zone is clear of all sea turtles for at least 60 minutes. Monitoring will continue through the pile driving period and end approximately 60 minutes after pile driving is completed. Observers must notify operators if any sea turtles appear to be moving toward the exclusion zone, so that operations can be adjusted (i.e., pile driving energy reduced) to minimize the size of the exclusion zone. If the latter occurs, the observer must monitor the area within and near the exclusion zone for 60 minutes, and if clear after 60 minutes after the last sighting, notify the operator that full energy pile driving may resume.

b. **DP vessel operations:** Observers will begin monitoring the exclusion zone as soon as the vessel leaves the dock and continue throughout the construction activity. Observers must notify the vessel operator if any sea turtles appear to be moving toward the exclusion zone, so that operations can be adjusted (i.e., reduced DP thruster energy) to minimize the size of the exclusion zone. If the latter occurs, the observer must monitor the area within and near the exclusion

zone for 60 minutes, and if clear after 60 minutes of the last sighting, notify the vessel operator that full energy thruster use may resume. As DP vessels will be operational for 24 hours, at least two observers shall be onboard the vessel, working a 12-hour on, 12-hour off schedule. That observer working the night shift needs to be provided night-vision binoculars.

37. Field verification of modeled noise levels for injury or mortality must be undertaken and must be conducted throughout the work period to confirm modeled sound levels. This needs to be conducted for: (1) impact pile driving operations; and (2) DP thruster use. Acoustic verification and monitoring must be conducted during impact pile driving (for the installation of each WTG foundation pile) and DP thruster use to ensure the exclusion zone is appropriately defined and thus, monitored by the observer required in Condition 39. Acoustic monitoring must be sufficient to determine source levels (i.e., within 1 m of the source), as well as the following:

a. Atlantic sturgeon acoustic injury thresholds: Distance to the 206 peak sound level (dBPeak) and 187 cumulative sound exposure level (dBcSEL) isopleths.

b. Sea turtle acoustic injury threshold: Distance to the 207 dBRMS isopleth.

Results of this monitoring must be reported, via email, (danielle.palmer@noaa.gov) to NMFS. For pile driving operations, results must be provided to NMFS prior to the installation of the next pile or within 24 hours of installation, whichever is sooner. For DP vessel operation, results must be provided every 24 hours. If there is any indication that injury thresholds have been attained in a manner not considered in the NMFS Biological Opinion dated January 30, 2014 (i.e., extent of 206 dB_{Peak} or 187 dB_{cSEL} [Atlantic sturgeon]; 207 dB_{RMS} [sea turtles]), NMFS must be contacted immediately.

38. Field verification of modeled noise levels for behavioral disturbance must be undertaken and must be conducted throughout the work period to confirm modeled sound levels. This needs to be conducted for impact pile-driving operations. These reasonable and prudent measures functions as a surrogate for monitoring incidental take. Acoustic verification and monitoring must be conducted during impact pile driving for the installation of each WTG foundation pile. Acoustic monitoring must be sufficient to determine source levels (i.e., within 1 m of the source), as well as the following:

a. Atlantic sturgeon acoustic behavioral disturbance thresholds: Distance to the 150 dBRMS isopleth.

b. Sea turtle acoustic behavioral disturbance threshold: Distance to the 166 dBRMS isopleth.

Results of this monitoring must be reported, via email (danielle.palmer@noaa.gov) to NMFS. For pile driving operations, results must be provided to NMFS prior to the installation of the next pile or within 24 hours of installation, whichever is sooner.

39. Any ESA listed species, including Atlantic sturgeon, observed during activities authorized under this Permit must be recorded, with information submitted to NMFS within 30 days. Any dead or injured individuals must be reported to NMFS within 24 hours. In the event of any observations of dead sea turtles or Atlantic sturgeon, dead specimens should be collected with a net and preserved (refrigerate or freeze) until disposal procedures are discussed with NMFS.

40. Reasonable attempts should be made to collect any dead sea turtles or sturgeon. These individuals shall be held in cold storage until disposition can be discussed with NMFS. The Corps or Deepwater Wind must contact NMFS within 24 hours of any observations of dead or injured ESA listed species. NMFS will provide contact information when alerted of the start of project activity. Until alerted otherwise, the USACE should contact the Section 7 Coordinator by phone (978)281-9328 or fax 978-281-9394). Take information should also be reported by e-mail to: incidental.take@noaa.gov.

Other Stipulations:

41. North Atlantic Right Whales Impact Avoidance: In order to avoid potential impacts to North Atlantic Right Whales, impact driving of wind turbine foundations shall not occur between November 1 and April 30th of any calendar year(s).

42. Nearshore Transmission Cable Burial Depth: The minimum transmission cable burial depth between Mean High Water (MHW) and Mean Low Water (MLW) shall be Elevation minus 10 feet MLW. Transmission Cable installation depth below beaches and dunes at cable landing locations shall also achieve a minimum burial depth of 10' below the beach sediment surface. Burial depth below dunes shall be based on the elevation of the beach at the base of the dunes and shall not include the dune height in the burial depth measurement. A post installation survey, stamped by a RI registered Land Surveyor or Engineer, that provides the elevation of the top of the cable on the mean low water datum and horizontally on the RI State Plane coordinate system shall be submitted to the Corps to confirm this requirement has been met. This survey shall be submitted within 15 days of transmission cable installation at the beach landing locations.

43. Post Construction Avian Monitoring: Post construction avian monitoring will be as described in the modified Avian and Bat Post Construction Monitoring Plan dated February 28, 2014.

44. Environmental Compliance Monitor: DWBI shall employ an Environmental Compliance Monitor (ECM) to monitor environmental compliance during all construction activities associated with the BIWF. The ECM shall be a third-party entity hired by DWBI.

45. Cable Location and Scour Protection: Within 15 days of completing the installation of the submarine transmission cable, DWBI shall submit a post-construction survey, stamped by a Rhode Island-registered Professional Land Surveyor or Engineer, of the actual cable location and the proposed cable easement with State Plane and LAT /LON coordinates for the cable angle points, easement comers / angle points of all scour protection matting (concrete filled bags, concrete mats, stone, etc.) installed on the ocean floor to protect the transmission cable. If the area of the ocean bottom impacted by protective armoring exceeds the 2.1 acres of total ocean bottom coverage estimated within the Environmental Report/COP, the Corps may require marine habitat compensation to be determined after submission of the post-installation survey.

3) The following special conditions will be included in the BITS permit (as noted to ensure the project is not contrary to the public interest [33 CFR 320.4(r)], to ensure the project complies with the Section 404(b)(1) Guidelines [40 CFR 230.10(d)], and/or at the permittee's request [33 CFR 325.4(b)]:

1. The special condition requirements contained in the Section 401 State Water Quality Certification issued by RIDEM for the BITS project are made a part of the Corps permit.

2. All BITS work is to be completed in accordance with the Permittee's September 2012 applications and subsequent modifications, and their Environmental Report and subsequent modifications.

3. The Permittee shall ensure that a copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a part of any and all contracts and subcontracts for work which affects areas of Corps of Engineers jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for work. If the permit is issued after the construction specifications, but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. If the permit is issued after receipt of bids or quotes, the entire permit shall be included in the contract or sub-contract as a change order. The term "entire permit" includes permit amendments. Although the Permittee may assign various aspects of the work to different contractors or subcontractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or subcontract shall require or allow unauthorized work in areas of Corps jurisdiction.

4. The Permittee shall complete and return the enclosed Compliance Certification Form to the Corps within one month after the completion of the authorized work.

5. Adequate sedimentation and erosion control devices, such as geotextile silt fences or other devices capable of filtering sediments, shall be installed and properly maintained to minimize impacts on wetlands and/or waters during construction. These devices must be removed after soils disturbed by construction activities are stabilized by revegetation or other means. The sediment collected by these devices must be periodically removed and placed in uplands, in a manner that will prevent its erosion and transport to wetlands and/or waters.

6. All areas of wetlands and/or waters, which are disturbed during construction, except those authorized herein for permanent impact, shall be restored to their approximate original elevation (but not higher) and condition by careful protection, and/or removal and replacement, of existing soil and vegetation. In addition, if upland clearing, grubbing, or other construction activity results in, or may result in, soil erosion with transport and deposition into a wetland or waterway, devices such as geotextile silt fences, sediment trenches, etc., shall be installed and properly maintained to minimize such impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices must also be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.

7. Except where stated otherwise, reports, drawings, correspondence and any other submittals required by this permit shall be marked with the words "Permit No. 2012-2724" and shall be submitted to: PATS Branch - Regulatory Division, Corps of

Engineers, New England District, 696 Virginia Road, Concord, MA 01742-2751. Documents which are not marked and addressed in this manner may not reach their intended destination and do not comply with the requirements of this permit. Requirements for immediate notification to the Corps shall be done by telephone to (978) 318-8338.

Essential Fish Habitat:

8. The Permittee shall provide their vessel operators with maps of sensitive hard bottom habitat in the Project Area, as well as a proposed anchoring plan that minimizes impacts on the hard bottom habitat to the greatest extent practicable. These plans shall be provided for all anchoring activity, including construction, maintenance, and decommissioning.

9. Prior to the start of construction, a monitoring plan shall be prepared to assess any hard bottom habitat impacts that cannot be avoided. The monitoring plan shall provide an assessment of impacts on the hard bottom habitat, as well as a plan for assessing recovery time for this sensitive habitat. The plan shall also include a means of recording observations of any increased coverage of invasive species in the impacted hard bottom area. The monitoring plan and subsequent reports shall be provided to the Corps, NMFS, and BOEM for review and comment.

10. Reports on the post-construction monitoring of cable installation shall be provided to the Corps, NMFS, and BOEM for review. Mitigation may be required if areas along the cable route do not recover or fill in naturally, as stated in the BIWF/BITS ER.

11. Noise mitigating measures shall be used during construction, such as soft-start procedures, to ensure fish species have the opportunity to evacuate the area prior to pile driving activity. A plan outlining noise mitigation procedures shall be provided to the Corps, NMFS and BOEM prior to construction. Resource agencies shall be notified within 24 hours if any evidence of a fish kill during construction activity is observed.

12. Monitoring for noise levels during construction and operation shall be conducted to verify the acoustic models and provide more accurate information on the area of impact. Noise monitoring reports shall be provided to the Corps, NMFS, and BOEM.

13. The Permittee shall provide vessel operators maps of sensitive hard bottom habitat in the project area of the BITS Scarborough Beach Alternative. Anchoring in complex and hard bottom habitats, classified as Type 3 (complex mixture of alternating bottom types including fine to coarse grained sediments and boulders) and Type 4 (hard, compact seabed including primarily gravel, cobbles, and boulders in a sand matrix habitat in the geophysical surveys, shall be avoided for all construction, maintenance, and decommissioning activities associated with the installation of the cable.

14. Side casting of material excavated from the offshore cofferdam shall be disposed of north and/or northeast of the cofferdam in sandy habitat, classified as Type 1 (fine grained sediments (mostly silt and fine sand) with possible isolated boulders). Material shall not be disposed of directly or adjacent to any hard bottom or complex habitat, classified as Type 3 or Type 4 in the geophysical surveys.

Avian and Bat:

15. DWBIT must develop a plan for constructing a new nest platform and relocating an

osprey nest in close proximity to the proposed Block Island Substation when the nest is inactive.

Cultural Resources:

16. DWBIT shall comply with the MOA executed in June, 2014 that was signed by the Army Corps of Engineers (Corps), Rhode Island State Historic Preservation Office (SHPO), The Bureau of Ocean Energy Management (BOEM), DWBIT, and the Narragansett Indian Tribal Historic Preservation Office.

Marine Navigation:

17. DWBIT shall ensure that cable routes are depicted on appropriate government produced and commercially available nautical charts.

18. DWBIT shall submit a detailed submarine cable system burial plan shall be submitted that depicts precise location and burial depths of the entire cable system. This plan shall be reviewed by the USCG and approved by the Corps of Engineers before construction of any component of the offshore renewable energy installation (OREI) begins.

Note: That portion of the BITS submarine cable that is proposed within the southbound (outbound) lane of the traffic separation scheme (TSS) may require USCG regulatory rulemaking (such as a temporary safety zone, or regulated navigation area. DWBIT will not be permitted to begin any cable-laying operations within this area until any USCG regulatory efforts are complete.

Marine Mammals and Sea Turtles:

19. **Exclusion and Monitoring Zones:** Exclusion and monitoring zones will be established around acoustically active Project components (i.e., pile driving (vibratory) and dynamic position (DP) thruster use for cable-lay operations). These zones will be established to monitor for ESA-listed species of sea turtles and whales that may enter the project area and to adjust project operations accordingly to prevent exposure of these animals to potentially injurious levels of underwater noise. Exclusion and monitoring zones are not being established for Atlantic sturgeon because this species occurs only under the water surface and visual observers will not be able to detect the presence of Atlantic sturgeon in the project area and no remote sensing technology that could detect Atlantic sturgeon is feasible for deployment in the area.

a. **Vibratory Pile Driving of Cofferdam** – Cofferdam installation and removal will produce sound levels of 180 dBRMS within 10 m from the source and thus, an exclusion zone will not be established. A 200-m radius monitoring zone, based on the modeled distance to the 160 dBRMS isopleth, will be monitored during all vibratory pile driving activities. All marine mammal sightings, including those beyond the 160 dBRMS isopleth, will be recorded.

b. **DP Vessel during Cable Installation** – DP vessel use during cable installation will not produce sound levels at 180 dBRMS beyond 1 m from the source and thus, an exclusion zone will not be established. A monitoring zone, based on the extent to the 160 dBRMS isopleth, will be established around the DP vessel. The monitoring zone will extend an estimated 21 m from the source (i.e., DP vessel). All marine mammal sightings, including those beyond the 160 dBRMS isopleth will be recorded.

20. Field Verification of Monitoring and Exclusion Zones:

a. **Impact Pile Driving of WTG Foundations** – Field verification of the initial 200-m radius exclusion zone and the 3.6-km radius monitoring zone for the 200-kJ impact pile driving hammer, as well as the 600-m radius exclusion zone and 7-km radius monitoring zone for 600-kJ impact pile driving hammer, will be conducted. Acoustic measurements will include the driving of the last half (deepest pile segment) for any given open-water pile and will include measurements from two reference locations at two water depths (a depth at mid-water and a depth at approximately 1 m above the seafloor). If the field measurements determine that the actual 180 dBRMS and 160 dBRMS zones of influence are less than or extend beyond the proposed exclusion zone and monitoring zone radii, a new zone(s) will be established accordingly. The Corps and NMFS will be notified within 24 hours whenever any new exclusion and/or monitoring zone are established by DWBI that extends beyond the initially proposed radii. Implementation of the revised zone(s) smaller than the proposed radii will be contingent upon Corps and NMFS review and approval. In the event that a smaller zone(s) is determined to be appropriate, DWBI will continue to use the originally proposed zone(s) until agency approval is given.

b. **Vibratory Pile Driving of Cofferdams** – Field verification of the initial 200-m radius exclusion zone (i.e. confirmation that 200 m = 160 dBRMS) will be conducted. Acoustic measurements will measurements from two reference locations at two water depths (a depth at mid-water and a depth at approximately 1 m above the seafloor). If the field measurements determine that the actual 160 dBRMS zones of influence is less than or extend beyond the proposed exclusion zone and monitoring zone radii, a new zone(s) will be established accordingly. The Corps and NMFS will be notified within 24 hours whenever any new exclusion and/or monitoring zone are established by DWBI that extends beyond the initially proposed radii. Implementation of the revised zone(s) smaller than the proposed radii will be contingent upon Corps and NMFS review and approval. In the event that a smaller zone(s) is determined to be appropriate, DWBI will continue to use the originally proposed zone(s) until agency approval is given.

c. **DP Vessel during Cable Installation** – Field verification of the preliminary 21-m radius monitoring zone (i.e., that the 160 dBRMS isopleth does not extend beyond 21-m) associated with DP vessel thruster use during cable installation will be performed using acoustic measurements from two reference locations at two water depths (a depth at mid-water and a depth at approximately 1-m above the seafloor). As necessary, the monitoring zone will be modified and implemented as described for vibratory pile driving).

21. Protected Species Observers:

a. All observations for whales and sea turtles in the exclusion and monitoring zones will be performed by NMFS-approved protected species observers (PSO). Observer qualifications will include direct field experience on a marine mammal/sea turtle observation vessel and/or aerial surveys in the Atlantic Ocean/Gulf of Mexico. It is anticipated a minimum of two PSOs will be stationed aboard each noise producing construction support vessel (e.g., derrick

barge and cable-lay vessel). Each PSO will monitor 360 degrees of the field of vision. Each PSO will follow the specified monitoring period for each of the following construction activities:

i. **DP Vessel during Cable Installation** – PSOs stationed on the DP vessel will begin observation of the monitoring zone as the vessel initially leaves the dock. Observations of the monitoring zone will continue throughout the construction activity and will end after the DP vessel has returned to dock.

ii. **Vibratory Pile Driving of Cofferdam** – The PSOs will begin observation of the monitoring zone at least 30 minutes prior to vibratory pile driving. Use of noise producing equipment will not begin until the associated monitoring zone is clear of all marine mammals and sea turtles for at least 30 minutes. In addition, soft-start of construction equipment, as described below, will not be initiated if the monitoring zone cannot be adequately monitored (i.e., obscured by fog, inclement weather, poor lighting conditions) for a 30-minute period. If a soft-start has been initiated before the onset of inclement weather, activities may continue through these periods if deemed necessary to ensure the safety and integrity of the Project. Observation of both the exclusion and monitoring zones will continue throughout the construction activity and will end approximately 30 minutes after use of noise-producing equipment is completed.

b. For each of the two construction activities (vibratory pile driving and DP thruster use during cable installation), PSOs, using binoculars, will estimate distances to whales and sea turtles either visually, using laser range finders, or by using reticle binoculars during daylight hours. It is important to note that all pile driving activity will occur only during daylight hours. As cable-laying activities will operate 24 hours a day, during night operations, night vision binoculars will be used. If higher vantage points (greater than 25 ft) are available, distances can be measured using inclinometers. Position data will be recorded using hand-held or vessel global positioning system (GPS) units for each sighting, vessel position change, and any environmental change.

c. For monitoring established exclusion and monitoring zones, each PSO stationed on or in proximity to the noise-producing vessel or location will scan the surrounding area for visual indication of whale and sea turtle presence that may enter the zones. Observations will take place from the highest available vantage point on the associated operational platform (e.g., support vessel, barge or tug; estimated to be over 20 or more feet above the waterline). General 360-degree scanning will occur during the monitoring periods, and target scanning by the PSO will occur when alerted of the presence of a whale or sea turtle.

d. Data on all observations will be recorded based on standard PSO collection requirements. This will include dates and locations of construction operations; time of observation, location and weather; details of whale and sea turtle sightings (e.g., species, age classification [if known], numbers, behavior); and details of any observed behavioral disturbances or injury/mortality. In addition, prior to initiation of construction work, all crew members on barges, tugs and support vessels, will undergo environmental training, a component of which will

focus on the procedures for sighting and protection of whales and sea turtles. A briefing will also be conducted between the construction supervisors and crews, the PSOs, and DWBIT. The purpose of the briefing will be to establish responsibilities of each party, define the chains of command, discuss communication procedures, provide an overview of monitoring purposes, and review operational procedures. The DWBIT Construction Compliance Managers (or other authorized individual) will have the authority to stop or delay impact pile driving activities, if deemed necessary. New personnel will be briefed as they join the work in progress.

22. **Ramp-up/Soft-Start Procedures:** A ramp-up (also known as a soft-start) will be used for noise-producing construction equipment capable of adjusting energy levels (i.e., pile driving operations). The DP vessel thrusters will be engaged from the time the vessel leaves the dock. Therefore, there is no opportunity to engage in a ramp-up procedure.

The ramp-up procedure will not be initiated if the monitoring zone cannot be adequately monitored (i.e., obscured by fog, inclement weather, poor lighting conditions) for a 30-minute period. A ramp-up or soft-start will be used at the beginning of each pile segment during vibratory pile driving in order to provide additional protection to marine mammals and sea turtles near the project area by allowing them to vacate the area prior to the commencement of vibratory pile-driving activities. The ramp-up requires an initial set of three strikes from the vibratory hammer at 40 percent energy with a one-minute waiting period between subsequent three-strike sets. The procedure will be repeated two additional times. If marine mammals or sea turtles are sighted within the vibratory pile driving monitoring zone prior to or during the soft-start, activities will be delayed until the animal(s) has moved outside the monitoring zone and no marine mammals or sea turtles are sighted for a period of 30 minutes.

23. **Shutdown Procedures:** The monitoring zone around the noise-producing activities (vibratory pile driving and DP thruster use during cable installation) will be monitored, as previously described, by PSOs for the presence of whales and sea turtles before, during and after any noise-producing activity. PSOs will work in coordination with DWBIT's Construction Compliance Managers (or other authorized individual) to stop or delay any construction activity, if deemed necessary. The following outlines the shutdown procedures:

a. **DP Vessel during Cable Installation** – During cable installation, a constant tension must be maintained to ensure the integrity of the cable. Any significant stoppage in vessel maneuverability during jet plow activities has the potential to result in significant damage to the cable. Therefore, during DP vessel operations if whales or sea turtles enter or approach the established exclusion zone, DWBIT will reduce DP thruster to the maximum extent possible, except under circumstances when ceasing DP thruster use would compromise safety (both human health and environmental) and/or the integrity of the Project. As with reduced hammer force for pile driving operations, reducing thruster energy will effectively reduce the potential for exposure of whales and sea turtles to sound energy. Normal use may resume when PSOs report that the monitoring zone has remained clear of whales and/or sea turtles for a minimum of 30 minutes since last the sighting.

b. **Vibratory Pile Driving of Cofferdams** – Cofferdam construction will produce sound levels of 180 dBRMS extending no further than 10 m from the source; therefore, no exclusion zone for this activity has been established. However, if ESA-listed species are observed entering or approaching the 200-m radius monitoring zone for vibratory pile driving, DWBIT shall halt vibratory pile driving as a precautionary measure to minimize noise impact on the animal(s). Ramp-up procedures for vibratory pile driving may be initiated when PSOs report that the monitoring zone has remained clear of marine mammals and/or sea turtles for a minimum of 30 minutes since the last sighting.

24. **Pile Driving - Time of Day Restrictions:** Vibratory pile driving cofferdams will occur during daylight hours starting approximately 30 minutes after dawn and ending 30 minutes prior to dusk unless a situation arises where ceasing the pile driving activity would compromise safety (both human health and environmental) and/or the integrity of the project. If a soft-start has been initiated prior to the onset of inclement weather (e.g., fog, severe rain events), the pile driving of that segment may be completed. No new pile driving activities will be initiated until 30 minutes after dawn or after the inclement weather has passed.

25. **Reporting:** DWBIT will provide the following reports during construction activities:

a. DWBIT will contact the Corps and NMFS at least 24 hours prior to the commencement of construction activities and again within 24 hours of the completion of the activity.

b. DWBIT will contact the Corps and NMFS within 24 hours of establishing any exclusion and/or monitoring zone. Within seven days of establishing exclusion and/or monitoring zones, DWBIT will provide a report to the Corps and NMFS detailing the field-verification measurements. This report will include the following information: a detailed account of the levels, durations, and spectral characteristics of the vibratory pile driving sounds, DP thruster use, and the peak, RMS, and energy levels of the sound pulses and their durations as a function of distance, water depth, and tidal cycle.

c. DWBIT must notify Corps and NMFS within 24 hours of receiving any field monitoring results which indicate that any exclusion or monitoring zones should be modified (i.e., due to in-field sound monitoring suggesting that model results were too big or too small). No changes will be made to the exclusion or monitoring zones without written (e-mail) approval from the Corps and NMFS.

d. Any observed behavioral reactions (e.g., animals departing the area) or injury or mortality to any marine mammals, Atlantic sturgeon, or sea turtles must be reported to the Corps and NMFS within 24 hours of observation. If any sturgeon are observed, these instances will also be reported to the Corps and NMFS (incidental.take@noaa.gov) within 24 hours.

e. A final technical report will be provided to the Corps and NMFS within 120 days after completion of the construction activities. This report must provide full documentation of methods and monitoring protocols (including verification of the sound levels actually produced within the exclusion and monitoring zones), summarizes the data recorded during monitoring, and comparing these

values to the estimates of listed marine mammals and sea turtles that were expected to be exposed to disturbing levels of noise during construction activities, and provides an interpretation of the results and effectiveness of all monitoring tasks.

26. **Strike Avoidance:** All vessels associated with the construction, operation, maintenance and repair, and decommissioning of the BITS will adhere to NMFS guidelines for marine mammal ship strike avoidance (see (http://www.nmfs.noaa.gov/pr/pdfs/education/viewing_northeast.pdf), including maintaining a distance of at least 500 yards from right whales, at least 100 ft from all other whales, and having dedicated lookouts and/or protected species observers posted on all vessels who will communicate with the captain to ensure that all measures to avoid whales are taken.

PSOs will be placed on vessels with noise-producing equipment (e.g., vessels with the pile driver and the DP vessels) and vessels assigned to actively observe the Project's established exclusion and monitoring zones through construction. Other vessels will have a dedicated lookout to watch for whales and sea turtles and to communicate with the captain.

27. **Geophysical Surveys Mitigation and Monitoring:** DWBIT will use the following measures during all geophysical surveys (i.e., multi-beam sonar and sub-bottom profiler [chirp]):

a. **Implementation of Ramp-Up**: At the start of each survey day, instruments that have the capability of running at variable power levels and operate at a frequency detectable by ESA-listed species will initially be operated at low-levels, then gradually increased to minimum necessary power requirements for quality data collection. This allows any listed species capable of detecting this noise to depart the area before full-power surveying commences. Surveys will not commence (i.e., ramp-up) when the exclusion zone cannot be effectively monitored.

b. **Establishment of Exclusion Zone**: Whenever multi-beam sonar or the chirp is in use, a 300-m radius exclusion zone (from the source) will be established around the operating vessel or the towed survey device. The sounds produced by this equipment cannot be perceived by sea turtles or Atlantic sturgeon because the frequency is too high. Therefore, the exclusion zone will be maintained for listed whales. For example, if a sound source is towed 30 m behind the survey vessel, the monitored area from the vessel will be out to 330 m (or 300 m from the source). The 300-m exclusion zone encompasses the 160 dBRMS isopleth, which for either geophysical survey device, is expected to occur within 150 m or less from the operating device.

c. **Visual Monitoring of the Exclusion Zones:** The exclusion zone will be monitored by a trained Environmental Compliance Monitor who will keep vigilant watch for the presence of marine mammals within the exclusion zone. The exclusion zone will be monitored for 30 minutes prior to the ramp-up of sound sources. If the exclusion zone is obscured by fog or poor lighting conditions, surveying utilizing noise-producing equipment will not be initiated until the entire exclusion zone is visible for the 30-minute period. If marine

mammals are observed within the 300-m safety exclusion zones during 30-minute period and before the ramp-up begins, surveying utilizing noise-producing equipment will be delayed until they move out of the area.

The Environmental Compliance Monitor assigned to the survey vessel, as well as all individuals onboard the survey vessel responsible for navigation duties, will receive training on marine mammal and sea turtle sighting and reporting and vessel strike avoidance measures. The training course will be modeled after a NMFS-approved marine mammal and sea turtle training program. The training will include details on the federal laws and regulations for protected species (ship strike information, migratory routes, and seasonal abundance), as well as training on species identification.

All sightings of NMFS-listed species will be recorded on an established NMFS-approved log sheet by the Environmental Compliance Monitor. The following data will be recorded:

i. Dates and location of operations;
ii. Weather and sea-state conditions;
iii. Time of observation;
iv. Approximate location (latitude and longitude) at the time of the sighting;
v. Details of sighting (species, numbers, behavior);
vi. General direction and distance of sighting from the vessel;
vii. Activity of the vessels at the time of sighting; and
viii. Action taken by the Environmental Compliance Monitor.

All observation data will be provided to NMFS within 60 days of the completion of surveys. In addition, during all survey operations DWBIT will report all sightings of ESA-listed species, regardless of condition, to NMFS (incidental.take@noaa.gov) within 24 hours of the observation and record as much information as possible (e.g., species, size, decomposition state, obvious injuries etc.).

d. **ShutDown:** If a listed whale is spotted within or transiting towards the exclusion zone when equipment is operating that can be heard by that individual (i.e., the chirp), an immediate shutdown of the equipment will occur. Subsequent restart or ramp-up of equipment will occur only after the whale has cleared the safety exclusion zone.

Sea Turtles and Atlantic Sturgeon:

28. All endangered species observers contracted by DWBIT must be approved by the Corps and NMFS. DWBIT shall provide the Corps, and the Corps shall transmit to NMFS, the names and resumes of all endangered species monitors to be employed at the project site at least 30 days prior to the start of WTG construction. No observer shall work at the project site without written approval of NMFS. If during project construction or DP vessel operations, additional endangered species monitors are necessary, DWBIT shall provide those names and resumes, and the Corps shall transmit those names and resumes to NMFS for approval at least 10 days prior to the date that they are expected to start work at the site.

29. Designated exclusion zones for all noise-producing activities must be monitored by NMFS-approved observers. The exclusion zone is considered that area ensonified by injurious levels (i.e., underwater noise levels greater than or equal to 180 dBRMS). Monitoring shall be as follows:

a. **Vibratory Pile Driving Operations:** Observers must begin monitoring the exclusion zone at least 60 minutes prior to the initiation of soft-start pile driving. Full energy pile driving must not begin until the zone is clear of all sea turtles for at least 60 minutes. Monitoring will continue through the pile driving period and end approximately 60 minutes after pile driving is completed. Observers must notify operators if any sea turtles appear to be moving toward the exclusion zone, so that operations can be adjusted (i.e., pile driving energy reduced) to minimize the size of the exclusion zone. If the latter occurs, the observer must monitor the area within and near the exclusion zone for 60 minutes, and if clear after 60 minutes after the last sighting, notify the operator that full energy pile driving may resume.

b. **DP vessel operations:** Observers will begin monitoring the exclusion zone as soon as the vessel leaves the dock and continue throughout the construction activity. Observers must notify the vessel operator if any sea turtles appear to be moving toward the exclusion zone, so that operations can be adjusted (i.e., reduced DP thruster energy) to minimize the size of the exclusion zone. If the latter occurs, the observer must monitor the area within and near the exclusion zone for 60 minutes, and if clear after 60 minutes of the last sighting, notify the vessel operator that full energy thruster use may resume. As DP vessels will be operational for 24 hours, at least two observers shall be onboard the vessel, working a 12-hour on, 12-hour off schedule. That observer working the night shift needs to be provided night-vision binoculars.

30. Field verification of modeled noise levels for injury or mortality must be undertaken and must be conducted throughout the work period to confirm modeled sound levels. This needs to be conducted for: (1) installation and removal of cofferdams with vibratory pile driving; and (2) DP thruster use. Acoustic verification and monitoring must be conducted during DP thruster use, and vibratory pile driving (for cofferdam installation and removal) to ensure the exclusion zone is appropriately defined and thus, monitored by the observer required in Condition 29. Acoustic monitoring must be sufficient to determine source levels (i.e., within 1 m of the source), as well as the following:

a. Atlantic sturgeon acoustic injury thresholds: Distance to the 206 peak sound level (dBPeak) and 187 cumulative sound exposure level (dBcSEL) isopleths.

b. Sea turtle acoustic injury threshold: Distance to the 207 dBRMS isopleth.

Results of this monitoring must be reported, via email, (danielle.palmer@noaa.gov) to NMFS. For pile driving operations, results must be provided to NMFS prior to the installation of the next pile or within 24 hours of installation, whichever is sooner. For DP vessel operation, results must be provided every 24 hours. If there is any indication that injury thresholds have been attained in a manner not considered in the NMFS Biological Opinion dated January 30, 2014 (i.e., extent of 206 dB_{Peak} or 187 dB_{cSEL} [Atlantic sturgeon]; 207 dB_{RMS} [sea turtles]), NMFS must be contacted immediately.

31. Any ESA listed species, including Atlantic sturgeon, observed during activities authorized under this Permit must be recorded, with information submitted to NMFS within 30 days. Any dead or injured individuals must be reported to NMFS within 24 hours. In the event of any observations of dead sea turtles or Atlantic sturgeon, dead specimens should be collected with a net and preserved (refrigerate or freeze) until disposal procedures are discussed with NMFS.

32. Reasonable attempts should be made to collect any dead sea turtles or sturgeon. These individuals shall be held in cold storage until disposition can be discussed with NMFS. The Corps or DWBIT must contact NMFS within 24 hours of any observations of dead or injured ESA listed species. NMFS will provide contact information when alerted of the start of project activity. Until alerted otherwise, the USACE should contact the Section 7 Coordinator by phone (978)281-9328 or fax 978-281-9394). Take information should also be reported by e-mail to: incidental.take@noaa.gov.

Other Stipulations:

33. **Nearshore Transmission Cable Burial Depth:** The minimum transmission cable burial depth between Mean High Water (MHW) and Mean Low Water (MLW) shall be Elevation minus 10 feet MLW. Transmission Cable installation depth below beaches and dunes at cable landing locations shall also achieve a minimum burial depth of 10' below the beach sediment surface. Burial depth below dunes shall be based on the elevation of the beach at the base of the dunes and shall not include the dune height in the burial depth measurement. Long Distance Horizontal Directional Drilling (Long Distance HDD) is required to assure this minimal burial depth requirement is met at the mainland Scarborough Beach landing. A post installation survey, stamped by a RI registered Land Surveyor or Engineer, that provides the elevation of the top of the cable on the mean low water datum and horizontally on the RI State Plane coordinate system shall be submitted to the Corps to confirm this requirement has been met. This survey shall be submitted within 15 days of transmission cable installation at the beach landing locations.

34. **Environmental Compliance Monitor:** DWBIT shall employ an Environmental Compliance Monitor (ECM) to monitor environmental compliance during all construction activities associated with the BITS. The ECM shall be a third-party entity hired by DWBIT.

35. **Cable Location and Scour Protection:** Within 15 days of completing the installation of the submarine transmission cable, DWBIT shall submit a post-construction survey, stamped by a Rhode Island-registered Professional Land Surveyor or Engineer, of the actual cable location and the proposed cable easement with State Plane and LA T /LON coordinates for the cable angle points, easement comers / angle points of all scour protection matting (concrete filled bags, concrete mats, stone, etc.) installed on the ocean floor to protect the transmission cable. If the area of the ocean bottom impacted by protective armoring exceeds the 2.1 acres of total ocean bottom coverage estimated within the Environmental Report/COP, the Corps may require marine habitat compensation to be determined after submission of the post-installation survey.

36. Prior to commencing construction, DWBIT shall obtain a Right-of-Way Grant from the Bureau of Ocean Energy Management for the portions of the BITS cable in federal waters on the Outer Continental Shelf.

PREPARED BY:

Michael Elliott Date: 9/4/2014

Project Manager

REVIEWED BY:

John P. Almeida Date: 9/4/14

Office of Counsel

APPROVED BY:

Date: 9/4/2014

Acting Chief, Regulatory Division

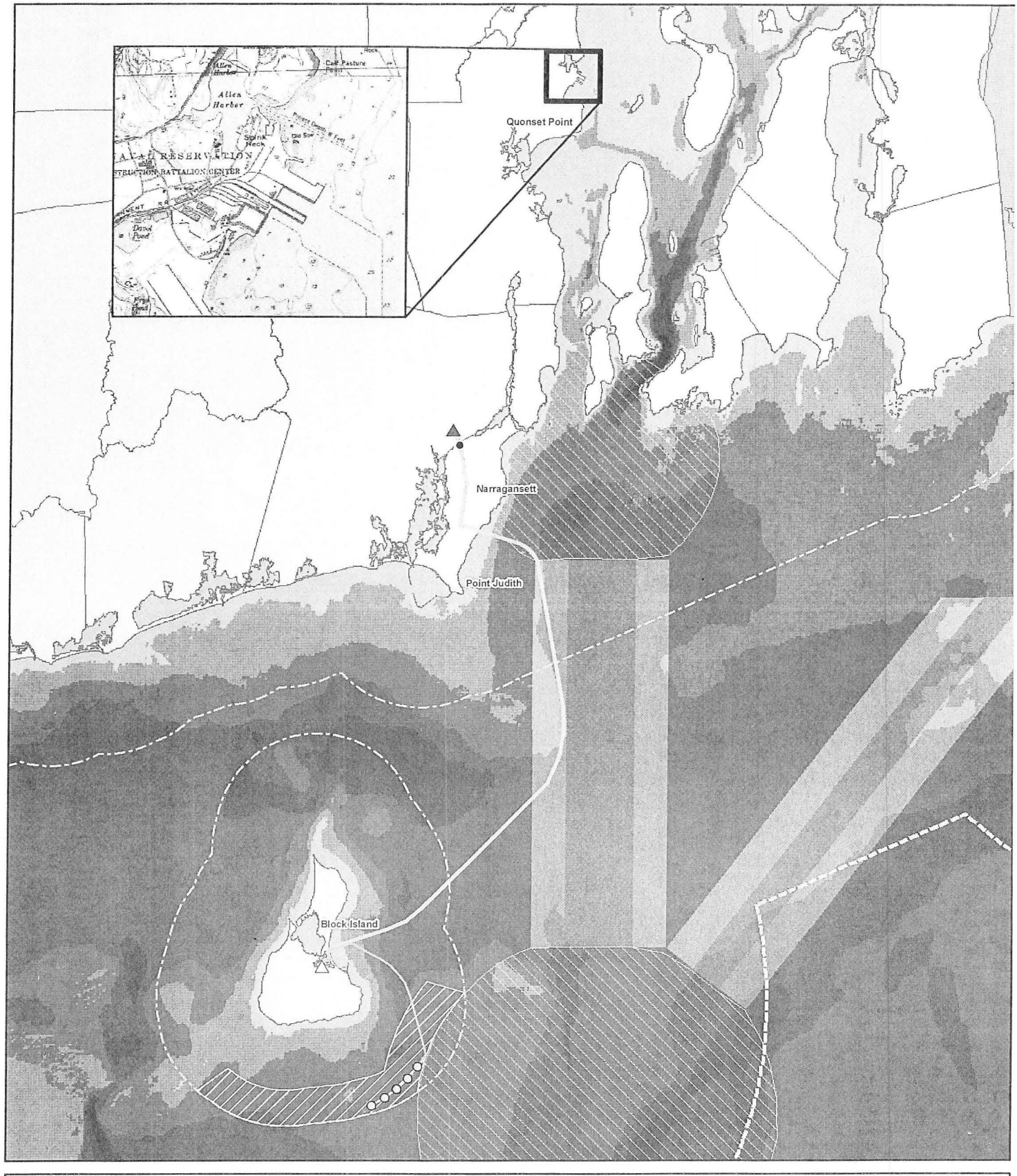


Figure 1.
Project Location
Block Island Wind Farm
Block Island Transmission System

October 2013

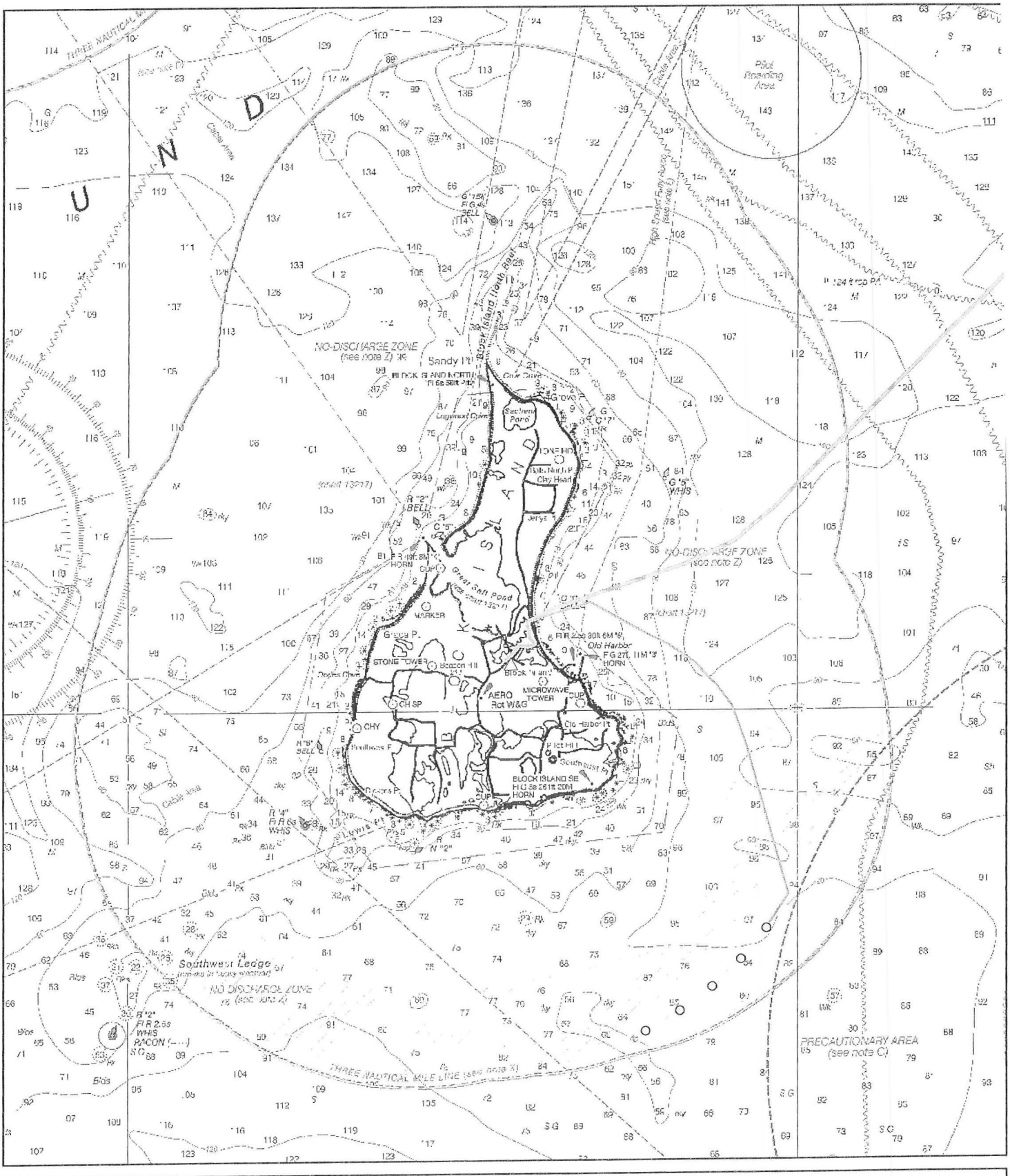
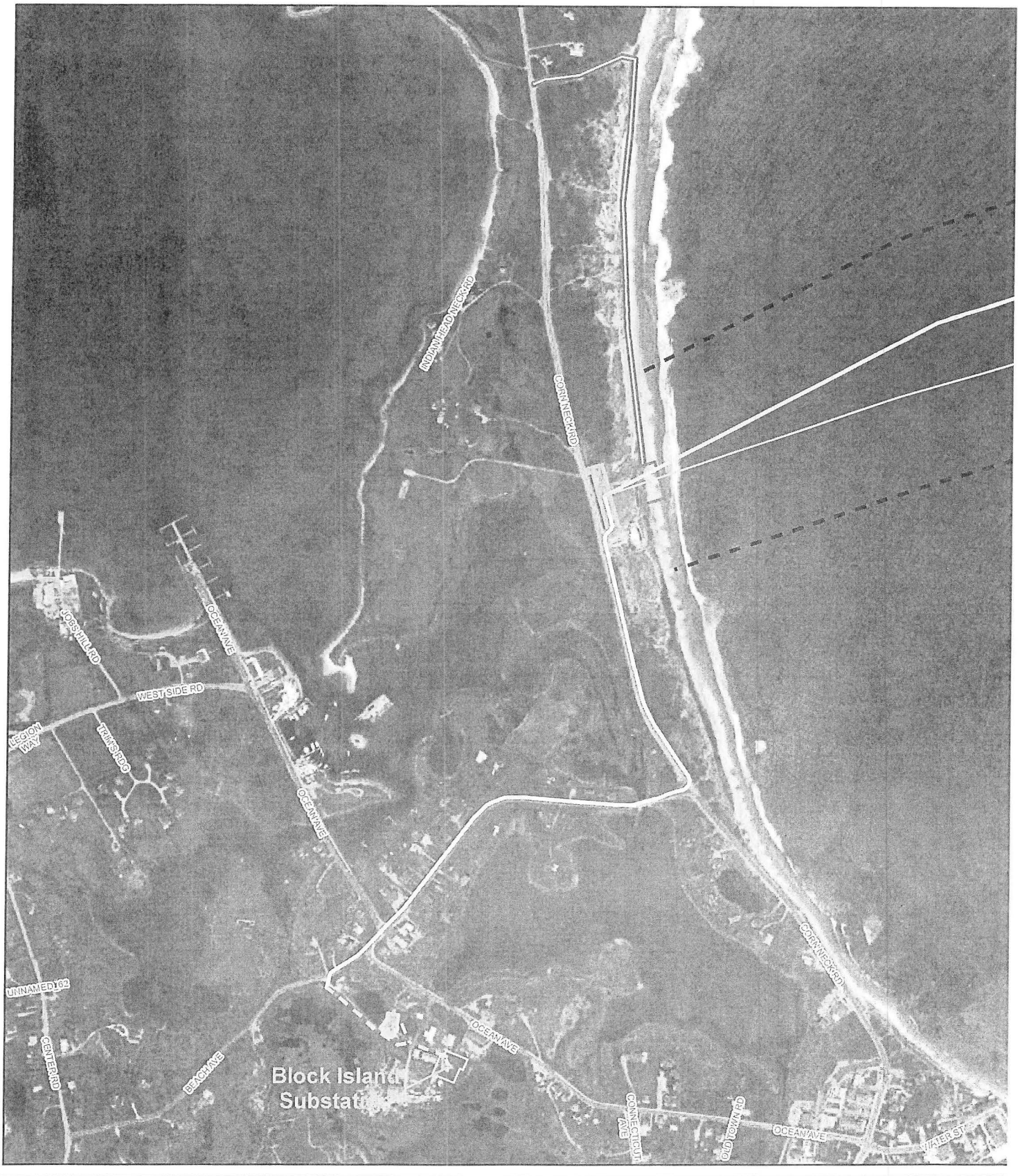


Figure 2.
BIWF Location
Block Island Wind Farm
Block Island Transmission System

October 2013



BITS Cable
Proposed Overhead Onshore Route (Block Island)
Proposed Buried Route
Export Cable
Block Island Substation
Existing BIPCO Substation
Temporary Access Road
HDD Beach Work Area
HDD Work Area
Survey Corridor (300m)

0 250 500 750 1,000 Feet

0 75 150 225 300 Meters

N

Figure 3.
Block Island Cable Route
Block Island Wind Farm
Block Island Transmission System
October 2013

Data Sources:
ESRI World Imagery (May 2010)

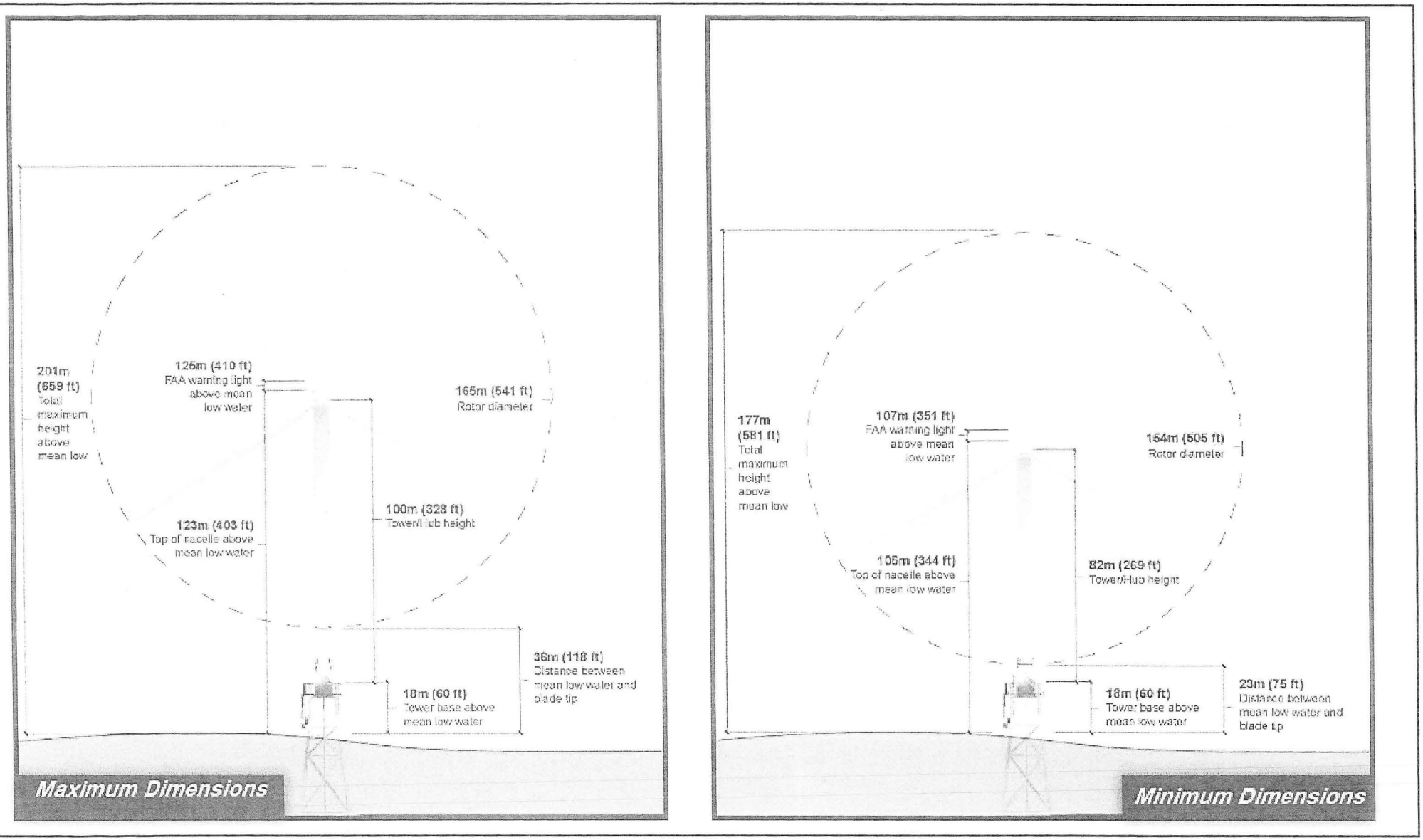


Figure 4.
Conceptual Turbine
Block Island Wind Farm
Block Island Transmission System
October 2013

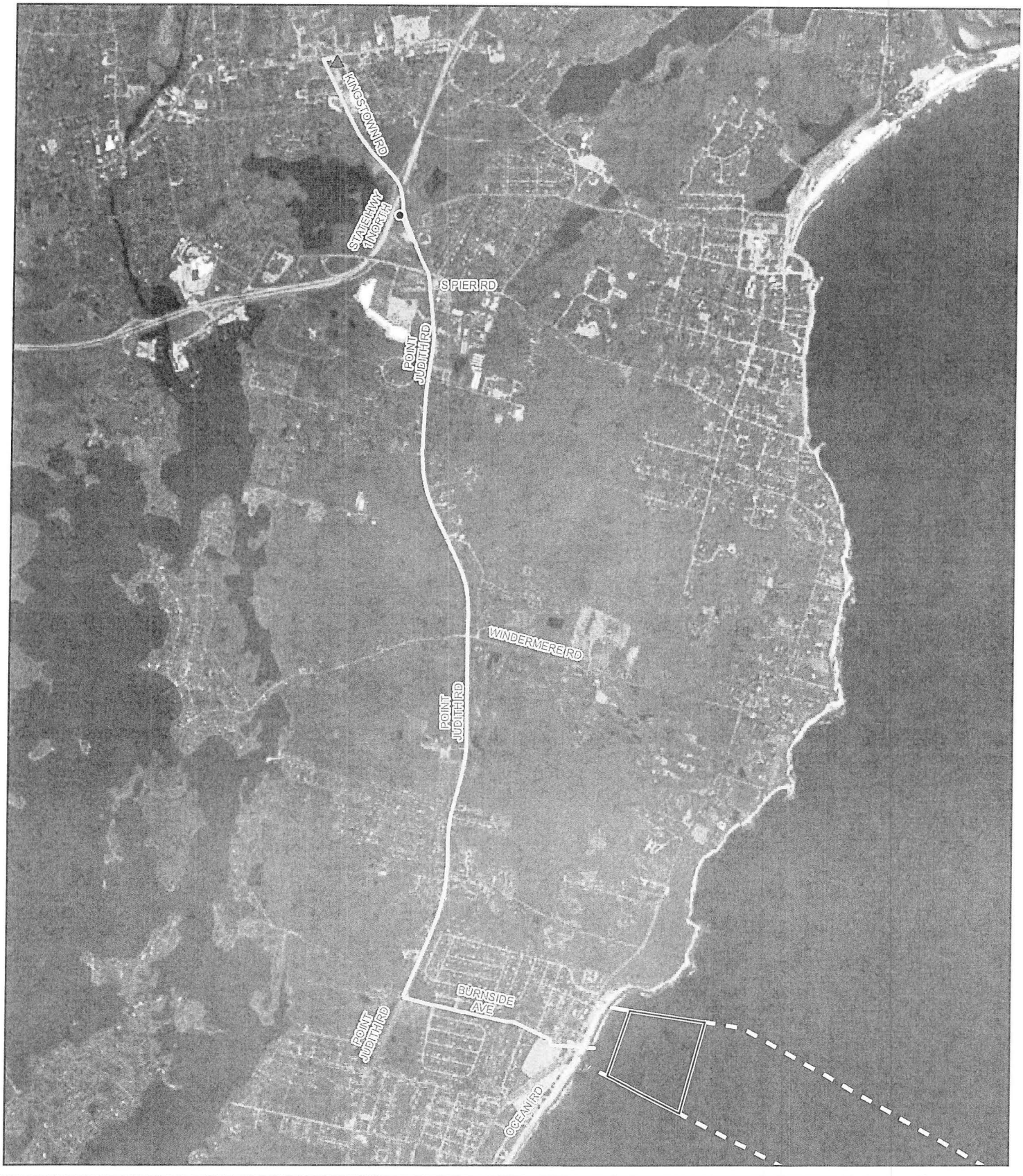
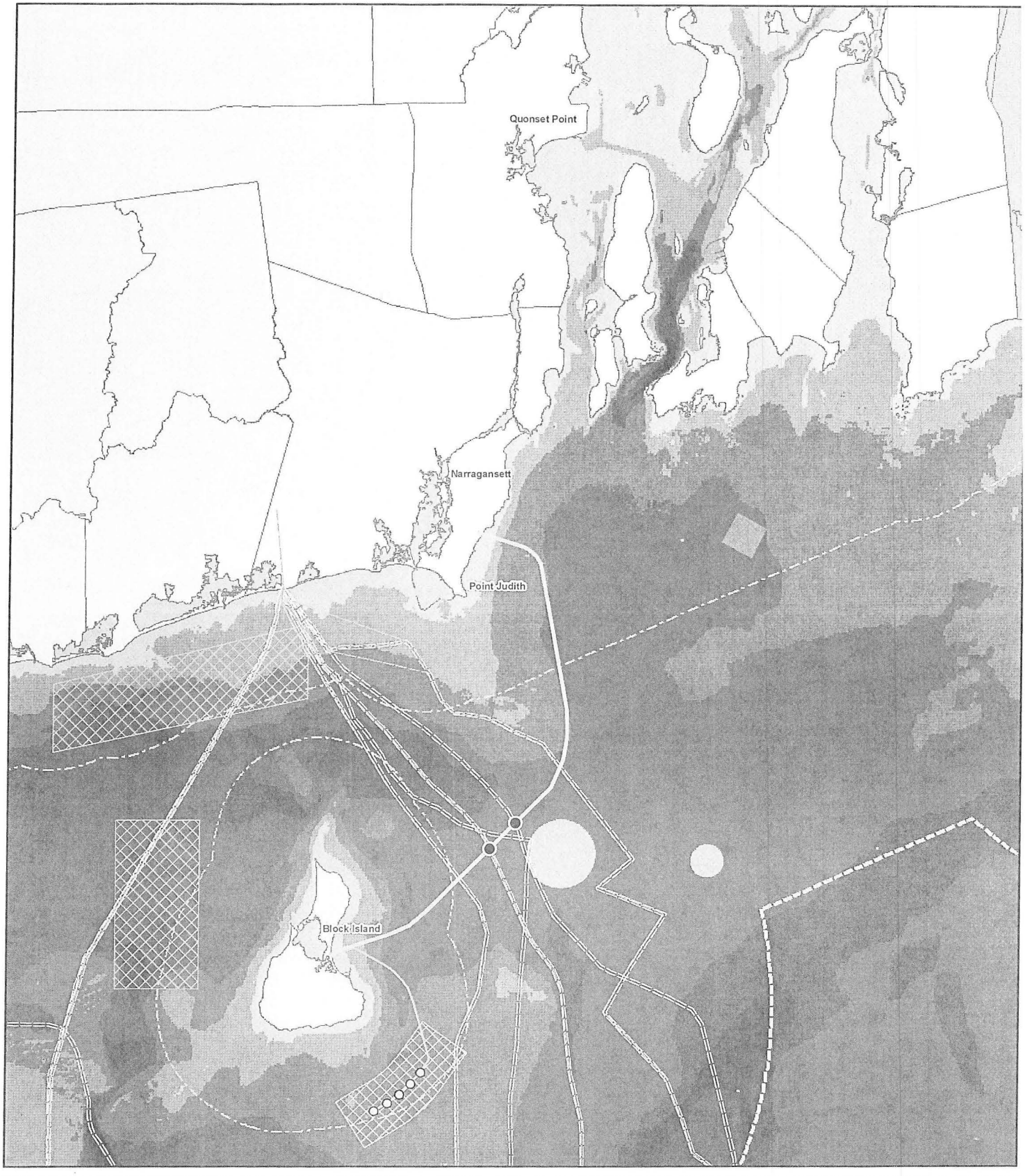


Figure 5.
Mainland Cable Route
Block Island Wind Farm
Block Island Transmission System

October 2013

Data Sources:
ESRI World Imagery
RIGIS (Aug 2001)



WTG Array
BITS Cable
Export Cable
Inter Array Cable
Active Cable Crossing
NOAA Submarine Cable
RI Ocean SAMP Cable
Disposal Site - Unexploded Depth Charge
Spoil Ground
3 Nautical Mile Line (State Waters)
12 Nautical Mile Line (Federal Waters)

Bathymetry
Depth in Meters
-50+
-50 - -40
-40 - -30
-30 - -20
-20 - -10
-10 - 0

Data Sources:
NOAA ENC (2011)
NOAA GEODAS (1998)
NOAA OCS (2011)
RI SAMP

0 1 2 3 4 5 6 Miles

0 1 2 3 4 Nautical Miles

N

Figure 6.
Identified Shallow Hazards
Block Island Wind Farm
Block Island Transmission System

October 2013

Quonset Point Port Facility

0 500 1,000 1,500 2,000 Feet

0 150 300 450 600 Meters

N

Figure 7.
Quonset Point Staging Area
Block Island Wind Farm
Block Island Transmission System

October 2013

Data Sources:
ESRI World Imagery (May 2010)

BIWF Alternative 2 (Preferred WTG Locations)
BIWF Alternative 1
Renewable Energy Zone
Bathymetry
Depth in Meters
-50+
-50 - -40
-40 - -30
-30 - -20
-20 - -10
-10 - 0

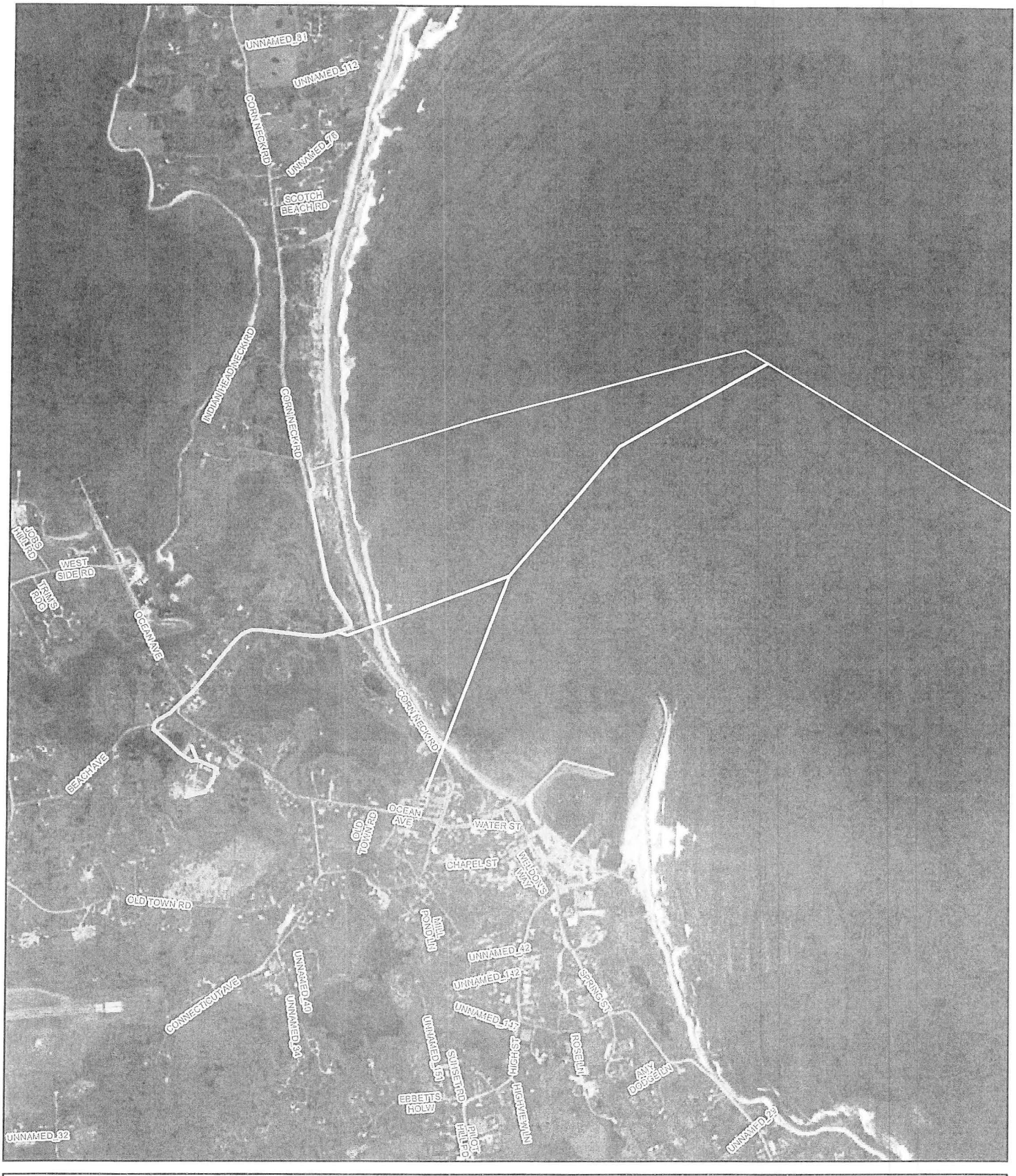
Data Sources:
NOAA ENC (2011)
NOAA GEODAS (1998)
NOAA OCS (May 2011)
RIGIS (Aug 2001)

0 0.5 1 1.5 2 Miles

0 0.5 1 1.5 2 Nautical Miles

N

Figure 8.
Alternative Locations for the WTG Array
Block Island Wind Farm
Block Island Transmission System
October 2013



Alternative 3 (Preferred Alternative)

Terrestrial Alignment 1 (Preferred Alternative)

Alternative 1

Alternative 2

Terrestrial Alignment 2

0 500 1,000 1,500 2,000 Feet

0 100 200 300 400 500 Meters

N

Figure 9.
Export Cable Route Alternatives
Block Island Wind Farm
Block Island Transmission System

October 2013

Data Sources:
ESRI World Imagery (May 2010)

- Wakefield Substation
- Dillon's Corner Switchyard
- Scarborough Beach Route (Preferred Route)
- Interconnection Point with TNEC 3302 Feeder Line
- Proposed Switchyard
- Narragansett Town Beach Route
- Bonnet Switchyard
- Bay Campus Route

0 0.25 0.5 0.75 1 Miles

0 0.5 1 1.5 2 Kilometers

N

Figure 10.
Mainland Interconnection Alternatives
Block Island Transmission System

October 2013

Data Sources:
ESRI World Imagery (May 2010)

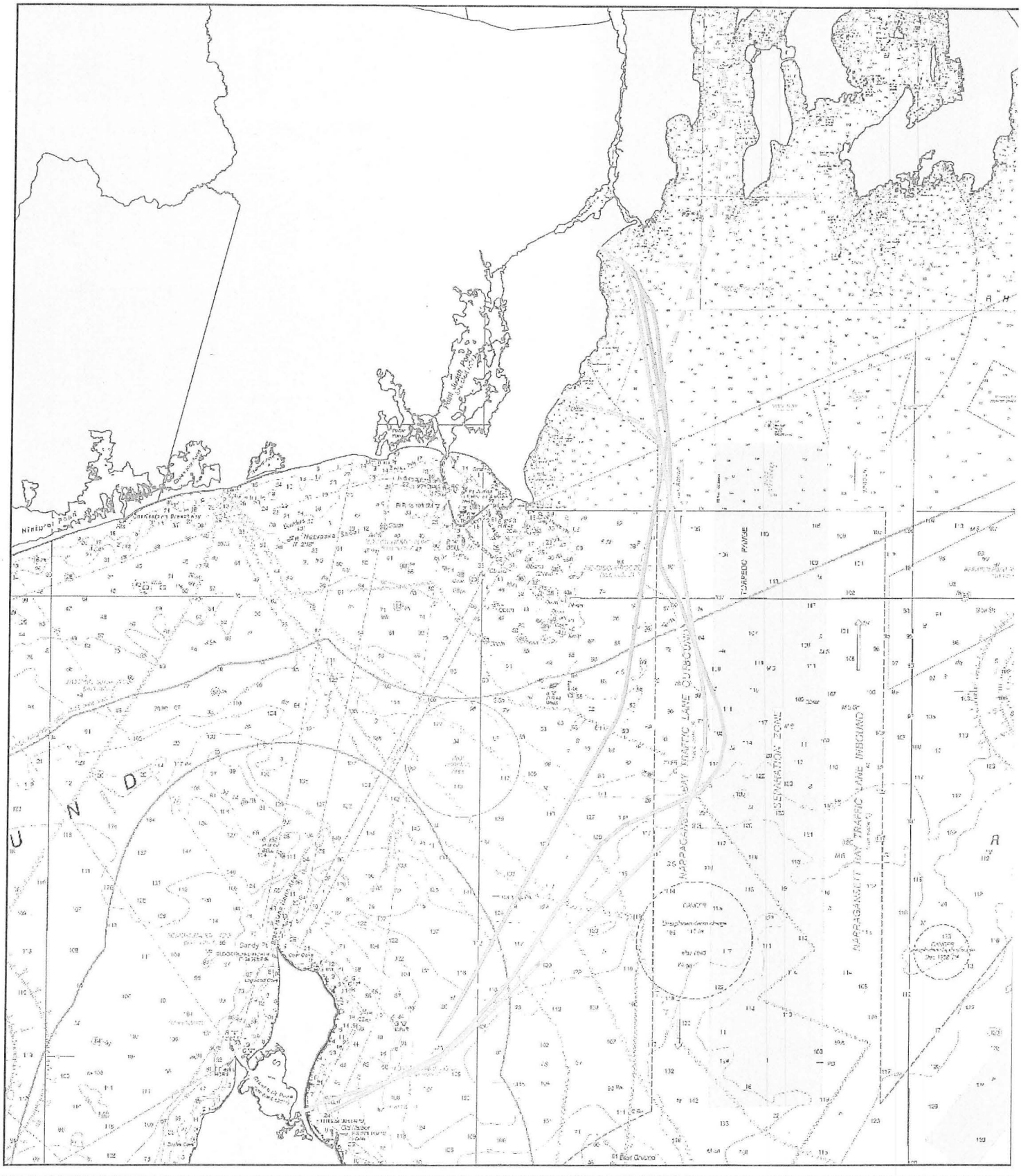


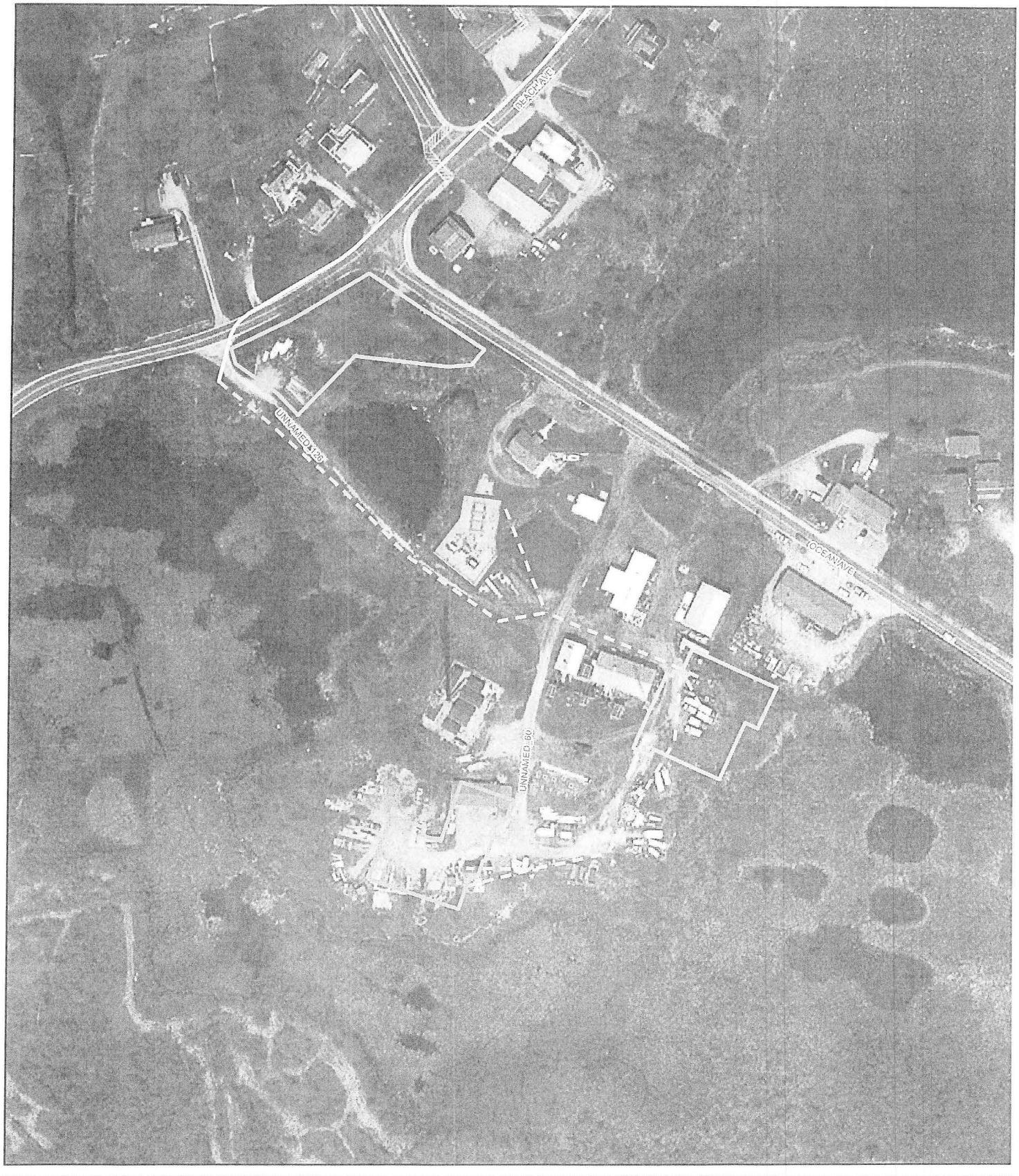
Figure 11.
Submarine Cable Alternatives
Block Island Transmission System

October 2013

Figure 12.
Alternative 1 Landfall Locations
Block Island Transmission System

October 2013

Data Sources:
ESRI World Imagery (May 2010)



Proposed Overhead Route (Block Island)

Proposed Buried Route

Substation Alternative A (Preferred Alternative)

Substation Alternative B

Substation Alternative C

Existing BIPCO Substation

0 50 100 150 200 Feet

0 25 50 75 Meters

N

Figure 13.
Block Island Substation Alternatives
Block Island Wind Farm
Block Island Transmission System

October 2013

Data Sources:
ESRI World Imagery (May 2010)