September 6, 2021

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Ms. Kimberly D. Bose Secretary Federal Energy Regulatory Commission 888 First Street, NE, Room 1-A Washington, DC 20426

Subject: Bourne Tidal Test Site, P-14775,

**DRAFT PILOT LICENSE APPLICATION** 

Dear Ms. Bose:

On behalf of the Marine Renewable Energy Collaborative of New England (MRECo), Barrett Energy Resources Group, LLC (BERG) is pleased to submit this Draft Pilot License Application (DPLA) to interconnect and operate a marine hydrokinetic test facility (the Bourne Tidal Test Site or BTTS) in the Cape Cod Canal in Bourne Massachusetts. The purpose of the facility is to test tidal turbine technology and collect associated marine and coastal science and engineering information. Developers require a grid connection to verify that their technology is grid-compatible. As part of the application, MRECo requests that the term of the pilot license be for eight years to allow for a full evaluation of the facility performance and potential environmental impacts.

The Federal Energy Regulatory Commission (FERC) issued to MRECo a Preliminary Permit on September 22, 2016 to study the feasibility of a marine hydrokinetic facility in the Cape Cod Canal. The Preliminary Permit "maintain[s] priority of application for a license during the term of the permit while the Permittee conducts investigations and secures data necessary to determine the feasibility of the proposed project and, if said project is found to be feasible, prepares an acceptable application for license" (see FERC Form P-1, Terms and Conditions of Preliminary Permit).



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At this time, the MRECo has permitted and installed the tidal test platform in the Cape Cod Canal to the west of the Railroad Bridge. It has also collected a sufficient amount of information on the environment of the project area, developed the design components of the marine hydrokinetic facility and its interconnection, and communicated the fundamental project elements and objectives to stakeholder groups to support a DPLA. The permits issued by federal, state, and local authorities for the platform included conditions for construction and operation of the facility as proposed. The BTTS platform was installed in November and December of 2017. It is expected that the conditions of those permits associated with the operation of the facility along with updated environmental monitoring and safeguard plans would be incorporated into a FERC license.

## **Draft Pilot License Application**

The DPLA is organized as follows:

- Executive Summary
- Notice of Intent
- Request for Waivers
- Pilot License Criteria
- Process Plan and Schedule
- Request for Designation as Non-Federal Representative
- Initial Statement
- Exhibit A Project Description and Proposed Mode of Operation
- Exhibit E Draft Environmental Report
- Exhibit F Design Drawings
- Exhibit G Project Boundary Maps
- Appendix A Consultation Record
- Appendix B Permits and Approvals Received
- Appendix C Operations and Maintenance Plan
- Appendix D Safeguarding Plans
- Appendix E Environmental Monitoring Plan
- Appendix F BTTS Business Plan

Document Accession #: 20211103-5084



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## Notice and Distribution of the Draft Pilot License Application

As required in 18 CFR 5.18(3)(i), legal notice stating the availability of MRECo's Draft Pilot License Application has been published in the September 3<sup>rd</sup> edition of the *Bourne Enterprise*. BERG has also notified all organizations listed on the attached distribution list, which includes all entities required by regulation to receive notification and provided a link to the eFiled license application on the FERC website. Two hard copies of the application have also been delivered by express mail to FERC in Washington, DC.

We appreciate the Commission's attention to MRECO's DPLA and look forward to the next stage of the licensing process.

Sincerely,

Stephen B. Barrett Principal

Cc: John Miller, MRECo

Encl.

# FERC PROJECT NO. 14775 DRAFT PILOT LICENSE APPLICATION



# **BOURNE TIDAL TEST SITE**

# FERC PROJECT NO. 14775 **DRAFT PILOT LICENSE APPLICATION**

September 6, 2021

Prepared for:

Federal Energy Regulatory Commission

888 First Street, NE Washington, DC 20426

Submitted by:

Marine Renewable Energy Collaborative of New England

PO Box 479 Marion, MA 02738

Prepared by:

**Barrett Energy Resources Group** 

PO Box 1004

Concord, MA 01742

T: 339.234.2696

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## **EXHIBITS**

Exhibit A – Project Description

Exhibit E – Environmental Assessment

Exhibit F – Design Drawings

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## **APPENDICES**

Appendix A Consultation Record

Appendix B Project Permits and Approvals Secured

Appendix C Operations and Maintenance Plan

Appendix D Safeguard Plans

Appendix E Environmental Monitoring Plan

Appendix F BTTS Business Plan

**FINAL** 

## Acronyms and Abbreviations

AC**Alternating Current** BTTS **Bourne Tidal Test Site** 

**BUAR** Board of Underwater Archaeology

CCC **Cape Cod Commission** 

CFR Code of Federal Regulations

CLC Cape Light Compact

CMR Code of Massachusetts Regulations

C. 91 Chapter 91 Program

CZMA Coastal Zone Management Act CZM Coastal Zone Management

DC **Direct Current** 

DEP Department of Environmental Protection

DMF **Division of Marine Fisheries** DOD Department of Defense **DPLA** 

**Draft Pilot License Application** EΑ **Environmental Assessment** 

**EFH Essential Fish Habitat** 

EIS **Environmental Impact Statement EPA Environmental Protection Agency FERC** Federal Energy Regulatory Commission

ILP **Integrated Licensing Process** 

kW **Kilowatt** 

MA F&G Massachusetts Fish and Game

MA Massachusetts

MSA Magnuson-Stevens Fishery Conservation and Management Act

MGL Massachusetts General Law

MHC Massachusetts Historical Commission MRECo Marine Renewable Energy Collaborative

MW Megawatt

Natural Heritage and Endangered Species Program **NHESP** 

**NMFS** National Marine Fisheries Service ORPC Ocean Renewable Power Company PCN **Pre-Construction Notification** State Historic Preservation Office SHPO **STEM** Science Technology Engineering Math **THPO Tribal Historic Preservation Office USFWS US Fish and Wildlife Services** 

**US Am Corps of Engineers** USACE WPA Wetlands Protection Act

#### **Executive Summary** 1.0

In December of 2017, the Bourne Tidal Test Site (BTTS), a three-pile supported platform, was installed in the Cape Cod Canal on the west side of the Railroad Bridge. The structure required permits from local, state, and federal agencies, including a Section 408 Real Estate license from the U.S. Army Corps of Engineers (USACE), the operator of the Cape Cod Canal. The purpose of the platform is to provide tidal turbine technology developers with a pre-permitted site in a real-time tidal environment for testing engineering and environmental aspects of tidal energy generators with a nameplate capacity of up to 50 kW. The BTTS is the first location in the U.S. where such activity can be conducted. The project was funded by the Commonwealth of Massachusetts through the Seaport Economic Council and the Massachusetts Clean Energy Center.

The Marine Renewable Energy Collaborative of New England (MRECo), the owner and operator of the BTTS, now seeks to complete testing capabilities of the platform by interconnecting the facility to the electric grid. To achieve this project phase and working closely with the electric utility, EverSource, MRECo submits this Draft Pilot License Application to the Federal Energy Regulatory Commission (FERC or the Commission).

This application describes the proposed project, project location, and hydrokinetic technology. It also includes an environmental assessment, listing of existing approvals governing facility operations and other conditions and contingencies. Over the 8-year term of the pilot license, new information will be collected to establish design and operational factors sufficient to review a new license application for the test site. Operating in a "test" environment will enhance control of the process and allow the managers to stop the test if effects are observed, a condition that is not feasible for a commercial installation. Notwithstanding, the proposal includes an environmental monitoring plan appropriate to assessing impacts and reporting data for the operation of a test site. If the pilot project causes unavoidable long-term harm to the environment that is in violation of federal environmental and public safety laws, then the Commission will have the authority to terminate the pilot license and require the removal of the pilot project.

The application is organized as follows:

Section 1 – Executive Summary

Section 2 – Description of how the project meets FERC pilot license criteria

Section 3 – MRECo's notification of intent to file an application for a hydrokinetic license

Section 4 – Presentation of the Process Plan and Schedule

Section 5 – MRECO's request for waivers from certain pre-filing requirement as a pilot project

Section 6 – MRECO's request to be designated a non-federal representative to the Section 7 and Section 106 review processes

Section 7 – MRECO's formal statement as applicant for a draft license

Section 8 – Legal Notices

Section 9 – Distribution List

Exhibit A – Project Description and Proposed Mode of Operation

Exhibit E - Draft Environmental Assessment

Exhibit F – Design Drawings

Exhibit G – Project Boundary Maps

Appendix A – Consultation Record

Appendix B – Permits and Approvals Secured

Appendix C – Operations and Maintenance Plan

Appendix D – Safeguard Plans

Appendix E – Environmental Monitoring Plan

Appendix F – BTTS Business Plan

### Pilot License Criteria 2.0

FERC criteria for hydrokinetic pilot project licensing are listed below along with how the proposed BTTS Project meets the criteria.

Criteria	BTTS Project
Small Projects (equal to or less than 5 MW) and occupy the minimum area commensurate with the technology to be employed	The project as proposed will test individual tidal turbines with a nameplate generating capacity of 50 kW or less. It is located at a designated test platform which has already been constructed.
The license will be short-term	Marine Renewable Energy Collaborative requests an 8-year license which is consistent with requests for other hydrokinetic pilot projects
Project avoids sensitive locations	The existing platform has obtained permits and approvals from local, state, and Federal environmental and navigation authorities. Copies of these approvals are included in Appendix A. Extensive consultations have been conducted with agencies during the review of permit applications and during the operation period, December 2017 to the present. Documentation of the consultation record is included in Appendix B. An Environmental Assessment of the project is provided in Exhibit E.
Project applications will contain strict safeguards to protect the public and	The BTTS has been permitted by the USACE, who own the site are responsible of safety and

environmental resources	environmental protection of the canal. Appendix C provides the BTTS Operations and Maintenance Plan. Appendix D contains the Safeguard Plans including the Project and Public Safety Plan, the Project Removal and Restoration Plan, the Navigation Safety Plan, and the Emergency Shutdown Plan, which will be implemented during project operations. Appendix E includes the environmental monitoring plan which has been demonstrated in the field during the data collection period.
Project will be removable and able to shut down on short notice, and will be	Appendix D includes the Project Removal and Restoration Plan. As a condition of a real estate
removed, with site restored, before the	license, MRECo has executed with the USACE to
end of the license term.	occupy federal lands, the applicant holds a
	Performance Bond. This is included in Appendix D.
The draft application must be in a form	An Environmental Assessment is provided in
sufficient to support environmental analysis and include proposed monitoring	Exhibit E. It follows the format provided in FERC's Guidance <i>Preparing Environmental Documents:</i>
plans	Guidelines for Applicants, Contractors and Staff. An
	Environmental Monitoring Plan is also provided.

## 3.0 Notice of Intent

# BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION BOURNE TIDAL TEST SITE PROJECT NOTICE OF INTENT TO FILE AN APPLICATION FOR AN ORIGINAL LICENSE FOR A HYDROKINETIC PILOT PROJECT

The Marine Renewable Energy Collaborative of New England (MRECo) hereby notifies the Federal Energy Regulatory Commission (FERC) of its intent to file an application for a hydrokinetic pilot project license for the Bourne Tidal Test Site Project located in the Cape Cod Canal in the Town of Bourne, Massachusetts. This application is being filed according to the Commission's guidance provided in the whitepaper "Licensing Hydrokinetic Pilot Projects" dated April 14, 2008 and in accordance with FERC regulations (18 CFR §5). As part of the requirements for approval to use FERC's expedited review process for hydrokinetic pilot projects, MRECo is also filing a request for waivers of certain pre-filing requirements of the Integrated Licensing Process, an assessment of how the Project meets the Commission's pilot project criteria, a process plan and schedule reflecting both licensing of the Pilot Project and transition from the Pilot Project to the larger proposed commercial build-out, and a Draft Pilot License Application prepared under the requirements of 18 CFR §5 and the FERC hydrokinetic pilot project whitepaper. This Notice of Intent is prepared according to Commission regulations at 18 CFR §5.5.

## 1. Applicant Name and Address

Marine Renewable Energy Collaborative of New England P.O. Box 479
Marion, MA 02738
Phone: (508) 728-5825

## 2. Project Number

P-14775

## 3. License Expiration Date

Not Applicable

## 4. Statement of Applicant's Intention to File

MRECo states its intention to file an application for an original hydrokinetic pilot project license for the Bourne Tidal Test Site Project located in Bourne, MA.

## 5. Type of Principal Project Works

MRECo's hydrokinetic pilot project will consist of the following components: a platform supported by a three-pile design engineered for deploying tidal turbines in tidal waters (existing); a single tidal turbine deployed from the platform at any one time with an expected nameplate capacity of 50 kW or less; an electrical cable to transmit electricity

generated by the tidal turbine unit from the platform through an overhead line to shore on the north side of the canal on land owned and operated by the USACE; switching and electricity voltage regulations equipment for transmitting the electricity to the electric grid owned and operated by EverSource; and appurtenant facilities for operations and maintenance of the project.

The primary purpose of the Bourne Tidal Test Site Project is to test the operations and maintenance of tidal turbines in pre-permitted ocean conditions for engineering performance, environmental protection, and compatibility with the larger electrical grid network.

## 6. Location of the Project

The Project is located in the Cape Cod Canal in Bourne Massachusetts.

## 7. Installed Plant Capacity

The Project would have an installed capacity of up to 50 kW.

## 8. Contact Information for:

(i) Every county in which any part of the project is located, and in which any Federal facility that is used or to be used by the project is located:

Barnstable County 3195 Main Street Barnstable, MA 02630

- (ii) Every city, town, or similar local political subdivision:
- (A) In which any part of the project, and any Federal facilities that would be used by the project, would be located; or

Town of Bourne 24 Perry Avenue Buzzards Bay, MA 02532-3441

Town of Sandwich 130 Main Street Sandwich, MA 02563

## (B) That has a population of 5,000 or more people and is located within 15 miles of the project dam;

Acushnet	Falmouth	Mattapoisett Board of Selectmen 16 Main Street Mattapoisett, MA 02739	Plymouth
Board of Selectmen	Board of Selectmen		Board of Selectmen
122 Main Street	59 Town Hall Square		11 Lincoln Street
Acushnet, MA 02743	Falmouth, MA 02540		Plymouth, MA 02360
Barnstable	Freetown Board of Selectmen P.O. Box 438 3 North Main Street Freetown, MA 02702	Marion	Sandwich
Board of Selectmen		Board of Selectmen	Board of Selectmen
367 Main Street		2 Spring Street	145 Main Street
Barnstable, MA 02601		Marion, MA 02738	Sandwich, MA 02563
Carver	Lakeville	Middleborough Board of Selectmen 20 Centre Street Middleborough, MA 02346	Rochester
Board of Selectmen	Board of Selectmen		Board of Selectmen
108 Main Street	346 Bedford Street		1 Constitution Way
Carver, MA 02330	Lakeville, MA 02347		Rochester, MA 02770
Fairhaven Board of Selectmen 40 Centre Street Fairhaven, MA 02719	Mashpee Board of Selectmen 16 Great Neck Road N. Mashpee, MA 02649	New Bedford Mayor 133 William Street New Bedford, MA 02740	Wareham Board of Selectmen 54 Marion Road Wareham, MA 02571

- (iii) Every irrigation district, drainage district, or similar special purpose political subdivision: (A) In which any part of the project, and any Federal facilities that would be used by the project, would be located; or
- (B) That owns, operates, maintains, or uses any project facilities that would be used by the project;

The U.S. Army Corps of Engineers has issued a Section 408 license permitting MRECo to use Federal facilities associated with the Cape Cod Canal for project construction and operation.

US Army Corps of Engineers, New England District Cape Cod Canal Field Office PO Box 1555 Buzzards Bay, MA 02532

(iv) Every other political subdivision in the general area of the project that there is reason to believe would likely be interested in, or affected by, the application; and

Mashpee Wampanoag Tribe 483 Great Neck Road South Mashpee, MA 02649

# **Process Plan and Schedule**

The Marine Renewable Energy Collaborative of New England (MRECo) proposes the following process plan and schedule for completing consultation, conducting additional pre-deployment field studies and filing for the Bourne Tidal Test Site Project license application.

**Table 1** provides the timeframes for the process plan and schedule and lists the stakeholders with the information to facilitate their participation in the licensing process for the proposed Project.

Table 1. Process Plan and Schedule

## **Pre-Filing Activity**

Date	Action	Review Period
9/3/21	MRECo files (1) Notice of Intent, (2) Draft Pilot License Application, (3) Request for Waiver and Process Plan, (4) Request for Designation as Non-Federal Representative. Publishes notice in newspaper.	45 days
10/21/21	FERC notices pre-filing process and document availability	30 days
11/21/21	Agencies and others file comments on Application and Process Plan	
	FERC solicits tribal consultation	
	FERC designates MRECo as non-federal representative	
12/21/21	FERC issues meeting notice (if needed)	30 days

1/21/22	FERC conducts Public Meeting/ Technical Conference (if
	needed)
1/30/22	FERC notices conclusion of pre-filing process and makes
	determination on request for waiver/process plan

## **Post-Filing Activity**

Date	Action	Review Period
4/1/22	MRECo files (1) Final Pilot License Application, (2) Draft Biological Assessment, (3) Coastal Zone Consistency Certification, and (4) Section 401 Certification (if needed).	45 days
5/15/22	FERC issues Biological Assessment	30 days
	FERC issues Acceptance and Ready for Environmental Assessment Notice, and Request for Intervention	
6/15/22	Agencies and others file recommendations, conditions, and comments on the application	
7/15/22	FERC issues Single Environmental Assessment and 10J Resolution	
7/30/22	Pilot License Available for FERC Decision	

The Pilot Project will consist of the tidal testing platform, a tidal turbine (of various designs but only one turbine tested at a time), above water cable to transmit power from the platform to shore, switching and electricity regulation equipment, and appurtenant facilities for operations and maintenance of the project. The Pilot License Application seeks a license term of 8 years. If operations of the platform meet the conditions of a pilot license, MRECo will file an application for a long-term FERC license for the facility.

#### **Request for Waivers** 5.0

The Marine Renewable Energy Collaborative (MRECo), in accordance with regulations at 18 CFR §5.29(f)(2), hereby requests that the Federal Energy Regulatory Commission (FERC) waive certain components of the pre-filing requirements of the Integrated Licensing Process (ILP) under the Commission's default licensing regulations. The FERC white paper, "Licensing Hydrokinetic Projects," explains how proposed hydrokinetic projects seeking pilot licenses will need to request waiver of certain ILP regulations to expedite processing of pilot license applications filed under 18 CFR §5.18. Based on previous waiver requests submitted to FERC under the Hydrokinetic Pilot License applications, MRECo has identified the follows ILP requirements for which it requests a waiver.

§5.2(a) – Document Availability, as MRECo is also requesting the waiver of the Pre-Application Document otherwise required under 18 CFR §5.6;

§5.6 – Pre-Application Document;

§5.8 – Notice of Commencement of Proceeding and Scoping Document, since FERC will be implementing alternative public notice under the procedures outlined in its Hydrokinetic White Paper within 15 days of filing and does not include the issuance of a scoping document at this phase of the pilot licensing process;

§5.9 – Comments and Information or Study Requests, since FERC will solicit public comment within 30 days on the Draft Pilot License Application;

§5.10 – Scoping Document 2, since this is not envisioned to be a component of the Pilot Licensing Process as framed by the Hydrokinetic White Paper;

§5.11 – Potential Applicant's Proposed Study Plan and Study Plan Meetings, since the Hydrokinetic White Paper requires that this content be included in the Draft Pilot License Application;

§5.12 - Comments on Draft Study Plan, since this requirement is not applicable given the

requested waiver above under §5.11;

§5.13 – Revised Study Plan and Study Plan Development, since this requirement is not applicable given the requested waiver above under §5.11;

§5.14 – Formal Study Plan Dispute Resolution Process, since this requirement is not applicable given the requested waiver above under §5.11;

§5.15 – Conduct of Studies, since this requirement is not applicable given the requested waiver above under §5.11;

§5.16 – Preliminary Licensing Proposal, since the Draft Pilot License Application provides this information and replaces this default document; and

§5.18(c) – Exhibit H since this exhibit is not a requirement for an original hydrokinetic pilot license application.

MRECo is filing this Draft Pilot License Application in compliance with 18 CFR §4.61 which governs applications for Major Water Power Projects less than 5 megawatts and is therefore including Exhibits A, E, F, and G. MRECo additionally requests that the Commission waive any components of these license application regulations that are not applicable to hydrokinetic projects and has included the additional information specific to hydrokinetic projects outlined in the Hydrokinetic Whitepaper that is not listed in 18 CFR §4.61.

## Request for Designation as Non-Federal Representative

The Marine Renewable Energy Collaborative (MRECo) requests designation as the Federal Energy Regulatory Commission's (FERC) non-federal representative to initiate informal Section 7 consultation with the United States Fish and Wildlife Service and National Marine Fisheries Service and to hold discussions related to threatened and endangered species with other appropriate parties on behalf of FERC for the proposed Bourne Tidal Test Site Project. MRECo also requests designation as FERC's non-federal representative to initiate Section 106 consultation with the Massachusetts State Historic Preservation Officer, potentially affected Native American Tribes, and other interested parties on behalf of FERC for the proposed Project.

#### **Initial Statement** 7.0

8 CFR §4.61(b)(1) MRECo applies to the Federal Energy Regulatory Commission (FERC) for a pilot license for the Bourne Tidal Test Site Project, FERC Project No. P-14775.

## 18 CFR $\S4.61(b)(2)$ The location of the Project is:

State or territory: Massachusetts

County: Barnstable

Township or nearby town: Bourne

Stream or other body of water: Cape Cod Canal, Atlantic Ocean

## 18 CFR $\S4.61(b)(3)$ The exact name, address, and telephone number of the applicant is:

John Miller, Executive Director

Marine Renewable Energy Collaborative of New England

P.O. Box 479

Marion, Massachusetts 02738

Phone: (508) 728-5825

# 18 CFR $\S4.61(b)(4)$ The exact name, address, and telephone number of each person authorized to act as agent for the applicant in this application, if applicable, are:

Stephen Barrett

Principal

Barrett Energy Resources Group, LLC

P.O. Box 1004

Concord, MA 01742

Phone: 339-234-2696

**18** CFR  $\S4.61(b)(5)$  The applicant is a domestic corporation and is not claiming preference

under Section 7(a) of the Federal Power Act.

18 CFR  $\S4.61(b)(6)(i)$  The statutory or regulatory requirements of the state(s) in which the Project would be located that affect the Project as proposed with respect to bed and banks and the appropriation, diversion, and use of water for power purposes, and with respect to the right to engage in the business of developing, transmitting, and distributing power and in any other business necessary to accomplish the purposes of the license under the Federal Power Act, are:

Projects located in Massachusetts state waters are subject to state and local permitting which have already issued for the existing test platform. Specifically, MRECo received an individual license from the MA Department of Environmental Protection under the Public Waterfront Act (MGL c. 91) and regulations (310 CMR 9.00). The project did not require the discharge of dredged and fill material and therefore did not require approvals under the Section 401 Water Quality Certification regulations (314 CMR 4.00) and State Water Quality Standards regulations (314 CMR 9.00). The Massachusetts Office of Coastal Zone Management reviewed the project and issued a consistency determination relative to the Massachusetts Coastal Policy as contained in the federally-approved Coastal and Ocean Plan (301 CMR 21.00). The Town of Bourne Conservation Commission issued an Order of Conditions for the project as part of its responsibilities in administering the MA Wetlands Protection Act.

An electrical interconnection application will be filed with EverSource, an investor-owned utility that owns and operates the electrical infrastructure in Bourne. Approval to place the utility infrastructure on state land owned and managed by the Massachusetts Department of Transportation (DOT) has been requested. No additional state permits are required for issuance of the FERC license.

18 CFR  $\S4.61(b)(6)(ii)$  The steps which the applicant has taken or plans to take to comply with each of the laws cited above are:

Marine Renewable Energy Collaborative of New England (MRECo) has been consulting with

state agencies during the permitting process for the test platform. These consultations were incorporated into the permits issued by local, state and federal agencies. The consultation record is provided in Appendix A and the permits/license issued for the BTTS are provided in Appendix B.

## 18 CFR §4.61(b)(7) Brief project description

The Pilot Project will consist of the existing three-pile supported testing platform, tidal turbine technologies of up to 50 kW tested one at a time, an above water electric cable from the platform to the shore plus the design and permitting of electrical infrastructure necessary to interconnect the facility to the electric grid.

The existing platform was installed in December 2017. The platform is currently supporting a variety of scientific equipment owned and operated by private technology companies and academic institutions for testing and data collection. Turbine manufacturers have expressed interest in using the platform and several have included the platform in federal funding applications that are pending. One developer has tested a turbine at the site to demonstrate its capabilities and the environmental monitoring plan. Operating in a "test" environment will enhance control of the process and allow the managers to stop the test if effects are observed, a condition that is not feasible for a commercial installation. The deployment of these turbines is covered by existing permits issued for the project addressing federal and state environmental and protected species laws. However, this application includes a more detailed and field tested environmental monitoring plan requested as part of the original authorization. Please refer to Appendix E to review the monitoring plan and report from the demonstration of the monitoring plan in June 2021.

A FERC license is required to interconnect a marine hydrokinetic device to the electrical grid. The main purpose of the FERC license will be to authorize this connection. MRECo seeks a pilot license term of 8 years which will be sufficient to validate the efficacy of the project prior to applying for a longer-term license for the platform.

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FINAL

## (i) Proposed installed generating capacity: 50 kW

(ii) Check appropriate box:

□ existing dam

□ unconstructed dam

□ existing dam, major modified project (see Sec. 4.4o(b)(14))

Not applicable. The Project will be built in the Atlantic Ocean and does not include a dam.

## 18 CFR §4.61(b)(8) Public Lands of the United States affected:

The Project would be located on submerged lands under ownership and control of the US Army Corps of Engineers for safe marine navigation and therefore may be classified as "public lands" as defined in the Federal Power Act. A Section 408 real estate license has previously been issued for the platform by the US Army Corps of Engineers (please refer to Appendix B to view copies of license issued) and a long-term request to extend this license has been requested as part of the current permitting effort.

18 CFR  $\S4.61(b)(9)$  Construction of the project is planned to start within \_\_ months, and is planned to be completed within \_\_ months, from the date of issuance of license.

The test platform was constructed in November and December 2017. Construction of required electrical infrastructure to connect the Project to the grid will primarily be subject to the utility's interconnection process and timeframe. However, it is reasonable to expect that construction of the interconnection facilities without actual grid export connection may commence prior to the FERC license award and could be completed in three months. Once a FERC license is awarded the connection for transmission of electricity to the grid will be implemented.

Additional information required by 18 CFR §5.18

18 CFR §5.18 (α)(1) Identify every person, citizen, association of citizens, domestic corporation, municipality, or state that has or intends to obtain and will maintain any proprietary right necessary to construct, operate, or maintain the Project;

MRECo is the only entity that has or intends to obtain and will maintain any proprietary rights necessary to construct, operate or maintain the proposed property.

18 CFR  $\S$ 5.18 (a)(2) Identify (providing names and mailing addresses):

(i) Every county in which any part of the Project, and any Federal facilities that would be used by the Project, would be located;

The Project Area is located within one county:

Barnstable County 3195 Main Street Barnstable, MA 02630

The U.S. Army Corps of Engineers has issued a Section 408 license permitting MRECo to use Federal facilities associated with the Cape Cod Canal for project construction and operation. An extension of this authority is currently pending.

US Army Corps of Engineers, New England District Cape Cod Canal Field Office PO Box 1555 Buzzards Bay, MA 02532

- (ii) Every city, town, or similar local political subdivision:
- (A) In which any part of the Project, and any Federal facilities that would be used by the Project, would be located; or

Cities or towns where project will be located:

Town of Bourne 24 Perry Avenue Buzzards Bay, MA 02532-3441

Town of Sandwich 130 Main Street Sandwich, MA 02563

# (B) That has a population of 5,000 or more people and is located within 15 miles of the Project dam;

No dam is proposed in association with this tidal energy project.

Cities/towns with a population of 5,000 or more people within 15 miles of the project:

Acushnet Board of Selectmen 122 Main Street Acushnet, MA 02743	Falmouth Board of Selectmen 59 Town Hall Square Falmouth, MA 02540	Mattapoisett Board of Selectmen 16 Main Street Mattapoisett, MA 02739	Plymouth Board of Selectmen 11 Lincoln Street Plymouth, MA 02360
Barnstable Board of Selectmen 367 Main Street Barnstable, MA 02601	Freetown Board of Selectmen P.O. Box 438 3 North Main Street Freetown, MA 02702	Marion Board of Selectmen 2 Spring Street Marion, MA 02738	Sandwich Board of Selectmen 145 Main Street Sandwich, MA 02563
Carver Board of Selectmen 108 Main Street Carver, MA 02330	Lakeville Board of Selectmen 346 Bedford Street Lakeville, MA 02347	Middleborough  Board of Selectmen 20 Centre Street Middleborough, MA 02346	Rochester Board of Selectmen 1 Constitution Way Rochester, MA
Fairhaven Board of Selectmen 40 Centre Street Fairhaven, MA 02719	Mashpee Board of Selectmen 16 Great Neck Road N. Mashpee, MA 02649	New Bedford Mayor 133 William Street New Bedford, MA 02740	Wareham Board of Selectmen 54 Marion Road Wareham, MA 02571

- (iii) Every irrigation district, drainage district, or similar special purpose political subdivision:
- (A) In which any part of the Project, and any Federal facilities that would be used by the Project, would be located; or
- (B) That owns, operates, maintains, or uses any project facilities that would be used by the Project;

The U.S. Army Corps of Engineers has previously issued a Section 408 license permitting MRECo to use Federal facilities associated with the Cape Cod Canal for project construction and operation (see Appendix B). An extension of this authority has been requested.

US Army Corps of Engineers, New England District Cape Cod Canal Field Office PO Box 1555 Buzzards Bay, MA 02532

(iv) Every other political subdivision in the general area of the Project that there is reason to believe would likely be interested in, or affected by, the application; and

Mashpee Wampanoag Tribe 483 Great Neck Road South Mashpee, MA 02649

(v) All Indian tribes that may be affected by the Project.

Mashpee Wampanoag Tribe 483 Great Neck Road South Mashpee, MA 02649

(3)(i) For a license (other than a license under Section 15 of the Federal Power Act) state that the Applicant has made, either at the time of or before filing the application, a good faith

effort to give notification by certified mail of the filing of the application to:

(A) Every property owner of record of any interest in the property within the bounds of the Project, or in the case of the Project without a specific Project boundary, each such owner of property which would underlie or be adjacent to any project works including any impoundments;

MRECo will notify by certified mail of the filing of the application to the following property owners which own land adjacent to the proposed substation locations being considered:

US Army Corps of Engineers, New England District Cape Cod Canal Field Office PO Box 1555 Buzzards Bay, MA 02532

Massachusetts Department of Transportation

Railroad Division

10 Park Plaza

Room 4160

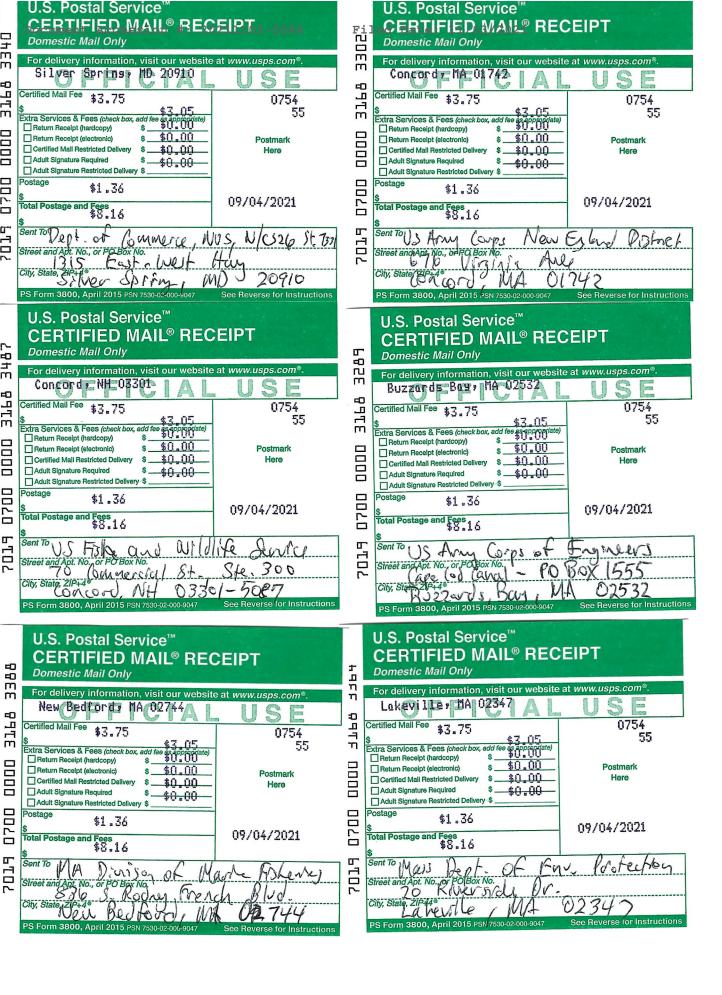
Boston, MA 02116

and (B) the entities identified in Paragraph (a)(2) of this Section, as well as any other Federal, state, municipal or other local government agencies that there is reason to believe would likely be interested in or affected by such application.

MRECo is notifying all parties identified on the distribution list in Section 9.

(ii) Such notification must contain the name, business address, and telephone number of the Applicant and a copy of the Exhibit G contained in the application, and must state that a license application is being filed with FERC.

The notification included the required information specified above.





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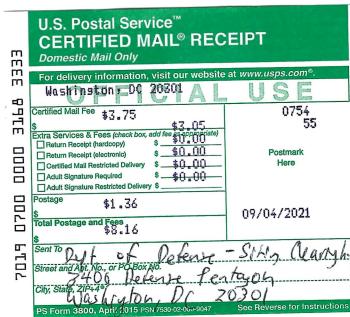
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#### **Legal Notices** 8.0

Legal notice was published in *The Bourne Enterprise* on September 3, 2019. The notice as posted on the newspaper webpage is included below.

**)**bituaries

Margaret A. Stotis

Margar

memorials have been submitted by the deceased's family and friends.

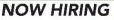
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## Supreme Court **Reverses Eviction** Moratorium

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## **Distribution List** 9.0

In addition to those identified for notification above, the following individuals and organizations are being notified by certified mail of the filing of the Draft License Application.

US Army Corps of Engineers New England District 676 Virginia Avenue Concord, MA 01742 ATTN: Ruthann Brien	National Marine Fisheries Service 55 Great Republic Drive Gloucester, MA 01930 ATTN: Alison Verkade	US EPA Region 1 5 Post Office Square Suite 100 (OEP06-3) Boston, MA 02109-3912 ATTN: Ed Reiner
Department of Defense Siting Clearinghouse 3400 Defense Pentagon Washington, DC 20301 ATTN: Steve Sample	Department of Commerce National Ocean Service Nautical Data Branch N/CS26, Station 7331 1315 East-West Highway Silver Spring, MD 20910	Massachusetts Coastal Zone Management 251 Causeway Street #800 Boston, MA 02114 ATTN: Robert Boeri
US Fish and Wildlife Service 70 Commercial Street Suite 300 Concord, NH 03301-5087	Massachusetts Department of Environmental Protection Southeast Regional Office 20 Riverside Drive Lakeville, MA 02347	Massachusetts Division of Marine Fisheries 836 S. Rodney French Blvd New Bedford, MA 02744
Massachusetts Natural Heritage and Endangered Species Program 1 Rabbit Hill Road Westborough, MA 01581	Massachusetts Historical Commission 220 Morrissey Blvd Boston, MA 02125	Massachusetts Board of Underwater Archaeology 251 Causeway Street #800 Boston, MA 02114
Cape Cod Commission 3225 Main Street Barnstable, MA 02630	EverSource 247 Station Drive, SE270 Westwood, MA 02090 ATTN: FERC Reviewer	Massachusetts Maritime Academy 101 Academy Drive Buzzards Bay, MA 02532

# Exhibit A – Project Description

# **Bourne Tidal Test Site**

Prepared by:

**Stephen Barrett** PO Box 1004 Concord, MA 01742

and

Marine Renewable Energy Collaborative of New England PO Box 479 Marion, MA 02738

September 6, 2021

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# **Summary Description of Proposed Project**

The Marine Renewable Energy Collaborative's (MRECo) mission is to promote the sustainable development of renewable energy in New England ocean waters. One focus is tidal energy which is emissions free and contributes to Federal, state, and local greenhouse gas emission reduction public policy goals. Tidal energy has different characteristics from other renewable energy sources like sun and wind because of its predictable nature associated with tidal cycles.

A significant obstacle to the development of the US tidal energy industry has been the lack of an established, pre-permitted tidal test site where developers can deploy devices to study their performance and potential environment effects. In response to this challenge, MRECo obtained a Preliminary Permit from the Federal Energy Regulatory Commission (FERC or the Commission) in September 2016 to study a tidal energy project in the Cape Cod Canal in the area shown in Figure A-1, and to prepare a Pilot License Application to support a grid-tied tidal energy project. It also obtained a state grant to install the Bourne Tidal Test Site (BTTS), the first tidal testing site in the U.S., which was erected in the fall/winter of 2017. However, in order to provide a comprehensive tidal testing facility, the BTTS must be connected to the electrical grid requiring a FERC license.

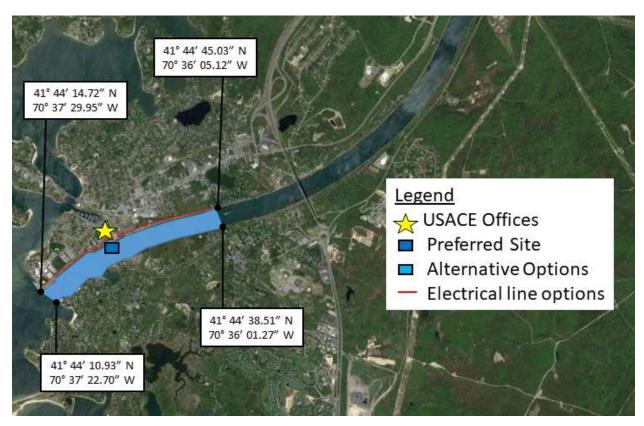


Figure A-1. Area of Preliminary Permit Granted by FERC to MRECo

This Draft Pilot License Application is submitted to obtain approval to tie the BTTS to the existing electrical grid and distribute electricity. It describes the proposed project, project location, and hydrokinetic technology. It also includes an environmental assessment, study and other conditions and contingencies. Over the 8-year term of the pilot license, it is expected that the information collected will be used to establish design and operational factors sufficient to review a new license application for a permanent tidal energy testing facility. In the event that the pilot project causes unavoidable long-term harm to the environment that is in violation of federal species protection laws, then the Commission will have the authority to terminate the pilot license and require the removal of the pilot project.

# **Project Site**

The proposed project is located in the Cape Cod Canal. The canal is an optimal location for a testing facility as it contains a reliable and predictable tidal current resource and is wellprotected from direct exposure to ocean energy forces, wave and wind, that can quickly

disrupt ocean field testing programs and damage associated infrastructure. A locus map of the project site is shown in Figure A-2.

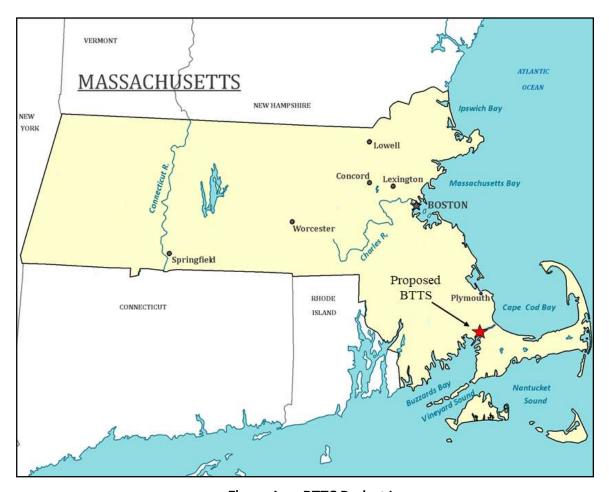


Figure A-2. BTTS Project Locus

The BTTS Project has general and broad support. The US Army Corps of Engineers (USACE), which owns and operates the Cape Cod Canal, has been a cooperating partner in the project. The Town of Bourne has supported the project in recognition of the associated economic, environmental, and educational benefits. Funding for the construction and installation of the BTTS has been provided by two state authorities - the Massachusetts Seaport Economic Council and the Massachusetts Technology Collaborative. MRECo is also in the process of securing approval from the Massachusetts Department of Transportation (DOT) to place utility poles on state land adjacent to the existing Cape Cod Railroad. To further meet its educational mission, MRECo will make oceanographic data collected at the BTTS available to the public.

The USACE issued a license to MRECo approving use of its property to install and operate the BTTS. [A copy of all licenses and approvals for the existing platform are provided in Appendix B.] The location of USACE property near the Bourne Railroad Bridge, the area approved for the lease, and the actual BTTS platform installed in Phase I as seen on Google Earth are shown in **Figure A-3**. Phase II is the subject of this draft license application which would authorize MRECo to connect the facility to the electrical grid.



Figure A-3. Project Location Relative to Cape Cod Canal and USACE Property

The area requested for the FERC license is shown in Figure A-4. It includes both the area of the existing platform and upstream and downstream areas of influence. These areas have been selected to protect against any other projects that may affect the successful pilot testing of the proposed facility. The total project area also includes the landside utilities to connect the BTTS to the electrical grid.

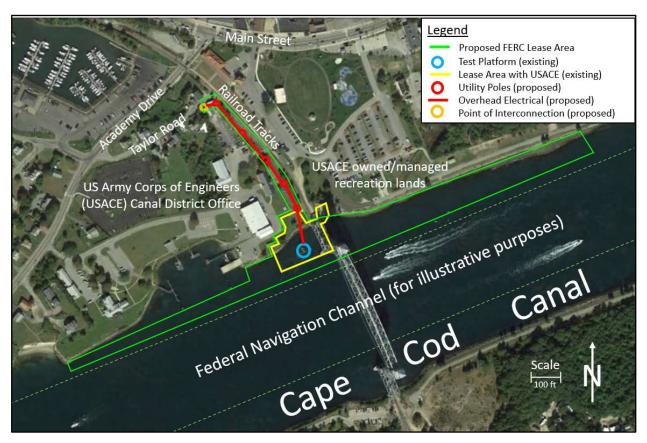


Figure A-4. Area Requested for the FERC Pilot License to Support the Proposed Project

# 1.2 Project Composition

The project has been configured such that the platform could be installed as Phase I, and initial testing of turbines could be conducted with electricity generation dissipated by electrical load on USACE property. In this configuration without a connection to the electricity grid, Phase I did not require a FERC license or other approvals associated with power interconnection from the local utility consistent with FERC's "Verdant Rule." However, for the BTTS to provide maximum capability and support turbine testing, a connection to the electrical grid is critical under Phase II and this requires a FERC license.

## 1.2.1 Phase I – Platform and Cables

The physical composition of the BTTS that has been constructed and currently rests in the Cape Cod Canal is shown in **Figure A-5**. The facility principally consists of a platform mounted to two primary piles with support from a third pile. The vertical turbine mounting arm is used

to mount and maintain turbines under test and is attached to the platform and held in place by a cross beam between the two primary piles spaced 23 feet apart from center. The piles rise approximately 45 feet above the seabed and are embedded to a depth of 50 feet below the seabed. A third support pile is located to the west of the platform and connected to the two primary piles by additional crossbeams. The sample turbine type shown in the plans is a horizontal axis open-bladed turbine with a 3-meter diameter swept area. A turbine similar to that shown was tested at the platform in June 2021. The turbine mounting pole has a lift which will be powered by a small electric winch.

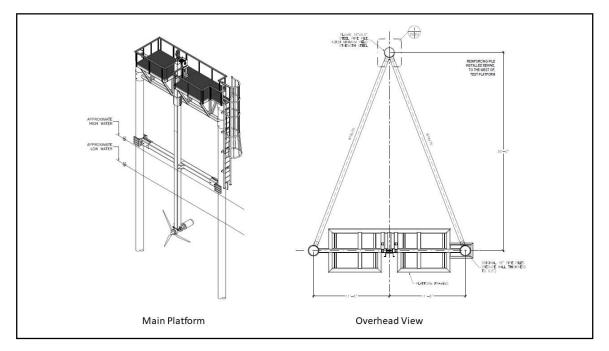


Figure A-5. Tidal Test Structure and Platform

A non-grid electrical system for capturing power and dissipating it in a load on land was part of the original project and approved through Phase I permitting. However, given developer requirements for a grid connection, the isolated option will no longer be developed.

The project is envisioned to consist of a single test site sized to accommodate testing a single individual turbine with a peak output rating of about 50 kW. If deployed for an entire year, such a turbine would produce approximately 175 MWh of electricity in a year. As the turbine testing will be conducted in a controlled testing regime, the actual amount of electricity

produced will be a function of time deployed in the water.

The MRECo obtained permits for the installation and operation of the test platform from various local, state, and federal authorities in 2016 and 2017. A list of approvals is included in Table A-1.

Table A-1. Tidal Test Structure and Platform Regulatory Approvals

Permit	Authority	Purpose	Comments
Preliminary Permit	FERC	Exclusive rights to investigate a tidal generation site.	Permit holder is expected to be working on preparing a FERC License Application.
Order of Conditions	Town of Bourne	Implementation of the State Wetlands Protection Act	Concurrence from MA Division of Marine Fisheries and MA Natural Heritage and Endangered Species Program
Chapter 91 License	MA Department of Environmental Protection	Protect public uses of state waters under the Public Waterfront Act	30-year license granted for the BTTS
Concurrence Determination	MA Coastal Zone Management	Ensure consistency of projects with state coastal program and plan	Issued allowing all federal approvals to proceed
Rivers and Harbors Act, Section 10	US Army Corps of Engineers	Protect safe navigation of nation's waterways	Permit includes concurrence under the Federal Endangered Species Act and Section 106 of the Historic Preservation Act Permit includes concurrence from the US Coast Guard
Section 408 Policy	US Army Corps of Engineers	Authorization of private use of Corps real estate and property	Authorization initially for one year, new application for a long-term lease under review

#### 1.2.2 Phase II – Connection to the Grid

The proposed action is Phase II of the BTTS which is to connect the facility to the grid. Figure A-6 shows the BTTS from Google Earth with the Phase II improvements for grid interconnection. The new utility infrastructure will be located on land owned and operated by the Massachusetts DOT and an application to approve this use has been made.



Figure A-6. Proposed Electrical Components of the Project

MRECo will file an interconnection application with the EverSource, the utility that owns and operates the electric grid in Bourne. The final design will be subject to EverSource's review and approval.

Phase II requires no construction in environmentally sensitive areas as all new work necessary to interconnect the facility to the electrical grid will be conducted on land in developed areas. However, the applicant has worked with regulatory resource agencies to develop an environmental monitoring plan to assess the potential impacts of the project on marine life.

This plan was demonstrated with an operating tidal turbine in June 2021. The environmental monitoring plan which includes the final report from the demonstration program is included in Appendix E.

#### **Description of Primary Project Works** 1.3

The following section describes the turbine generator types, platform, and electric transmission.

#### 1.3.1 Turbine Generator Unit

The BTTS is intended to provide a pre-permitted test platform for new tidal energy generation devices. A variety of turbine generator units will be located on the BTTS. The size of the units will be limited by the size of the platform.

While the technology closest to commercialization, axial turbines, was used as the objective for the design, the platform was developed so as to accommodate a wide range of potential 'in stream' technologies to include:

- 1. Axial Turbine in which the axis of rotation in essentially parallel to the flow of water. Blades that capture the water power rotate in a plane perpendicular to the flow. This is the technology closest to commercialization and it resembles the common wind turbine.
- 2. Cross Flow Turbine which has an axis of rotation perpendicular to the flow of water. The axis of rotation may be vertical or horizontal. The Darius wind turbine is an example of a cross flow turbine.
- 3. Oscillating Turbine that converts flow by a blade or other body that oscillated up and down or back and forth in the flow driven by either blade lift or vortex shedding.
- 4. Conveyor Turbine that converts flow by use of blades mounted on a chain or belt that moves across the flow in a continuous conveyor mechanism.

5. Archimedes Screw – Turbine that uses a 'screw' shaped capture mechanism to convert flow to rotary motion which is then connected to a generator.

All devices tested must fit within the test window of the platform mounting piles, approximately seven meters. All devices tested will generate less than 50 kW at peak output. A comprehensive list and description of turbine classes and types proposed for testing is included in Attachment A of Appendix E. Appendix F, BTTS Business Plan, includes a list of actual developers that have contacted MRECo about testing appropriate technology at the BTTS. Turbines that vary from the objective turbine of an axial turbine of 3 meters in diameter will be reviewed by the firm that designed the platform to ensure it does not exceed design parameters.

# 1.3.2 Platform

The platform was constructed in Phase I and is currently located at the project site.

It consists of a platform connected to two primary piles with a third pile, forming a triangle, providing support and stability. From the platform, there is a winch powered by electricity from shore that is used to lower and raise tidal turbines brought to the platform for testing. The turbines are lowered into the water column beneath the platform and between the two primary platform piles. The turbine is subject to unobstructed water flows coming from the east as it passes under the Railroad Bridge.

# 1.3.3 Cables

A cable system to support Phase I, the non-grid option, has been designed but will not be installed due to developer needs for a grid connected facility. No design envisioned underwater cables, except as required to connect the turbine to the platform.

In Phase II, a new electricity distribution line will be constructed to connect the BTTS with the wider electrical grid. High speed internet owned and managed by Open Cape, which is currently installed on outdated (former telegraph) utility poles, will also be installed on the

poles. Seven new electrical utility poles, approximately 40 feet in height, will be installed in the existing railroad right-of-way between the BTTS and the closest existing electricity carrying utility pole at the end of Taylor Road. A three-phase overhead line with a capacity of 13.2 kV will be installed on top of the utility poles to allow the BTTS to export electricity generated from test turbines to the electric grid. The existing Open Cape high speed internet lines will also be installed along the new utility network providing a data connection for the platform.

A new inverter with a rating of 133,000 watts will convert the generated power from DC to AC. It will be supplied on three phase power at 150 AMPS and 277/480 voltage. A new bidirectional meter will be installed at the interconnection point on Taylor Road along with a TT AC disconnect.

As part of Phase II to connect the facility to the electrical grid, turbine manufacturers will be responsible for converting the power output to DC. A commercial rectifier approved by EverSource will be used to convert the power from DC back to AC. Then it will be stepped up to interconnect to the grid.

MRECo has filed an interconnection application with the Eversource, the utility that owns and operates the electric grid in Bourne. The final design will be subject to Eversource's review and approval.

### 1.4 Operational Mode

The facility is oriented with the open end of the platform facing east toward the railroad bridge. Optimal turbine testing will occur during ebb tide when water is flowing east to west through the canal. However, turbines that are designed to capture dual direction flows may still operate on the flood time (west to east) as well.

The facility has a full-time manager. The manager will work with turbine manufacturers, USACE staff, and other stakeholders during facility operations. An operations and maintenance plan is included in the application as Appendix C.

Data from a variety of oceanographic sensors will be transmitted remotely to a server and nonproprietary data will be accessible to the public. Any data collected specific to the turbine will be the property of the turbine manufacturer.

The business plan envisions a 1-2 month test for each turbine, with 3-4 tests per year. It is anticipated that the swap out will be done by crane or barge, depending upon turbine design. There will be 20 to 40 visits to the platform per year as all of the operations will be monitored remotely. No visits will be planned outside of normal USACE working hours, but there may be occasional needs to visit the platform for urgent maintenance issues. Such visits would be subject to the same canal operations rules as any other vessel.in both ebb and flow tides. The BTTS Business Plan is included as Appendix F.

The proposal includes a comprehensive environmental monitoring plan to ensure that potential environmental effects are limited in an adaptive management manner as necessary. Operating in a "test" environment will also enhance control of the process and allow the managers to stop the test if effects are observed, a condition that is not feasible for a commercial installation.

#### **Estimated Average Annual Generation** 1.5

Peak generation based on the size of the platform is 50 kW. Given the variability of tidal energy based on tidal cycles and the temporary nature of the turbine testing, it is difficult to estimate electrical generation from the facility. For planning purposes, we estimate 175 MWh per year.

#### 1.6 Estimated Average Head

Not applicable.

#### Reservoir Surface Area with Net and Gross Storage Capacity 1.7

Not applicable.

#### 1.8 **Hydraulic Capacity**

The Cape Cod Canal is 17.4 miles long, 480 feet wide with a design depth of 32 feet. It is a sealevel canal that connected Cape Cod Bay to the east and Buzzards Bay to the west with no locks, dams, or other obstructions. No reservoir is associated with the Cape Cod Canal. Maximum flow can reach 4-5 knots. It is a man-made canal originally opened in 1914 and heavily used by a wide range of vessels.

The hydraulic capacity of the canal is governed by the tidal cycles. During flood tides, water moves through the canal from west to east. During ebb tides, water moves east to west. The BTTS is located on the west side of the Railroad Bridge to capture higher flow velocities during the ebb tide.

The project site is west of the Railroad Bridge near the north side of the canal. Site characteristics were measured in field surveys conducted in June 2016. Water depth at the site of the platform is about 27 feet (8.4 meters) as shown on Figure A-7.

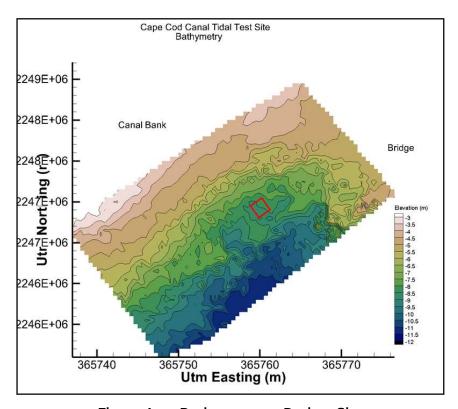


Figure A-7. Bathymetry at Project Site

Current flow was measured for ebb (west) flow at 1.5 m/s as shown in Figure A-8.

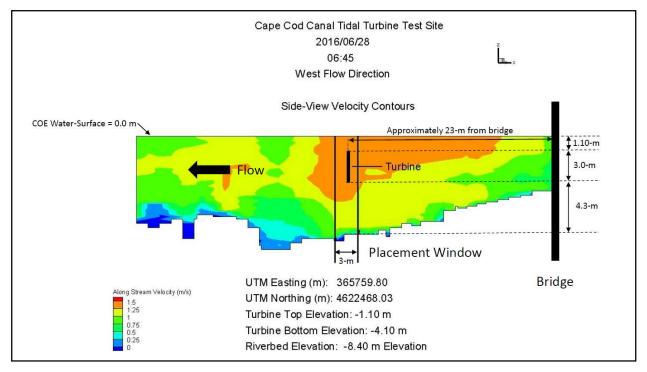


Figure A-8. Canal Cross-section at Site with Measured Current Velocity

The proposed project will capture a fraction of the hydraulic capacity of the Cape Cod Canal.

## 1.9 Estimated Project Cost

The platform cost approximately \$400,000 to design, fabricate and install, with \$300,000 provided by the Seaport Economic Council and \$100,000 from matching efforts by MRECo.

The electrical design and installation which constitute Phase II of the project are projected to cost \$241,651. Funding for Phase II was awarded by the Seaport Economic Council in February 2021.

A sophisticated data collection system with oceanographic sensors and real-time delivery of public information to the internet is also planned which will cost an additional \$100,000. A portion of this infrastructure will be installed under the recently awarded grant.

Turbine manufacturers will delivery turbine units to the site for testing and will pay a lease fee

to use the platform.

#### **Purpose of Proposed Project** 2.0

The primary purpose of the BTTS is to provide a pre-permitted test platform for new tidal energy generation devices. There are significant barriers to testing ocean energy technology. Each project proposed for testing must characterize the test site, assess potential impacts of the testing phase, and obtain approvals from regulatory authorities to proceed with the test. Test sites are often natural environments with many potential impacts that are not found in the manmade Cape Cod Canal. The developer must make improvements to the site to allow for testing. The BTTS provides a pre-permitted facility for turbine manufacturers to use to test their technology.

There are several secondary reasons for establishing the BTTS. It will create an economic development opportunity for the Town of Bourne. It will establish a technology hub for ocean energy and ancillary activities like oceanographic sensors and instrumentation. It will also produce clean and predictable electricity for use by nearby electricity consumers.

#### **Estimated Cost of Preparing License Application** 3.0

Field work required to assess existing conditions in the area of the platform cost \$20,000. Initial permitting of the platform including preparation of the Preliminary Permit cost \$10,000. Preparation of the Draft Pilot License Application cost \$20,000.

#### On-Peak and Off-Peak Power Values 4.0

ISO-NE (the independent system operator) operates the wholesale energy markets in New England. On-peak and off-peak prices are determined hourly based on system demand and the marginal generation bid.

The Cape Light Compact (CLC) is the regional broker for residents on Cape Cod and Martha's Vineyard, including the Town of Bourne, and retail electricity prices are negotiated by CLC on behalf of the communities. CLC negotiates base rates for different categories of users (residential, municipal, commercial).

The existing supply provided to customers is 100% from renewable energy sources. Recent CLC prices are listed in **Table A-2**.

Table A-2. Electricity Prices to Cape Light Customers, 2018

Rate Class	Price (cents / kWh)
Basic Residential	10.600
Commercial	11.075
Industrial	11.348

## Estimated Increase or Decrease in Power Generation Due to 5.0 **Change in Project Operations**

Not applicable. The Project represents an original license, and the proposed operations therefore do not represent a change in operations.

# Remaining Undepreciated Net Investment in Project

Investment in the project to date has been provided by public entities including the Seaport Economic Council and the Massachusetts Technology Collaborative. The amount of public investment spent to date is approximately \$300,000. An additional \$200,000 has been budgeted for supporting the responsible licensing of the project.

# 7.0 Annual Operation and Maintenance Expenses

Annual operations and maintenance costs include 1 FTE and support from MRECo and are estimated to be approximately \$100,000 to \$200,000 per year.

# **Detailed Single Line Electrical Diagram**

A single line electrical diagram is provided as Figure A-9. The plan set is included in the DPLA, Exhibit F. Turbine manufacturers will be responsible for converting this power output to

DC. An inverter will be used to convert the power from DC back to AC. Then it will be stepped up to interconnect to the grid.

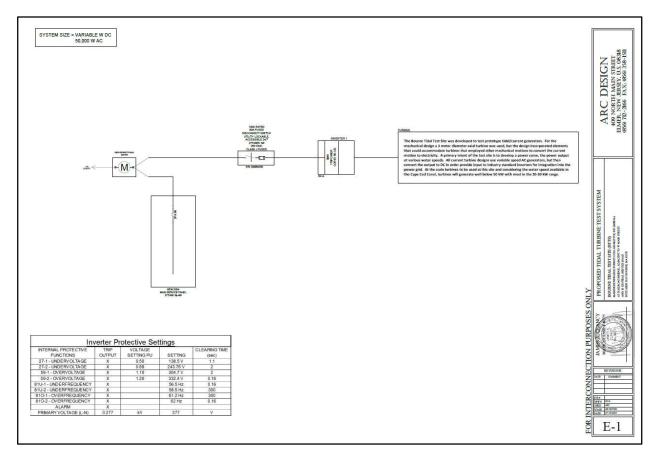


Figure A-9. Single Line Electrical Diagram

# 9.0 Measures Planned to Ensure Safe Management, Operation and Maintenance of the Project

MRECo has prepared plans required by FERC to ensure that the test site operates in a safe and environmentally-protective manner. Two critical elements unique to this project provides optimum conditions for meeting these measures:

- (1) the project is located in the Cape Cod Canal adjacent to the US Army Corps of Engineers Canal District Office which oversees safe passage through the canal as well as safety of the railroad bridge which is directly adjacent to the project; and
- (2) the facility is a test facility where turbines will be under direct observation as well

as remote monitoring by engineers and scientists on a regular basis which provides greater oversight and direct monitoring of the facility that would not be possible for a similar commercial-scale facility which would need to rely on remote monitoring and extended response times.

The following plans will be implemented in cooperation with staff at the US Army Corps of Engineers.

Appendix C provide the overall operations and maintenance plan for the facility. It includes basic procedures for expected system operations and special considerations given the type and location of the facility. Proper operations and maintenance under expected conditions is important to promoting safe management of the facility.

Appendix D includes the safequarding plans such as the Project and Public Safety Plan, the Project Removal and Site Restoration Plan, the Navigation Safety Plan, and the Emergency Shutdown Plan. As part of licensing requirements with the US Army Corps of Engineers, MRECo has secured a performance bond to ensure that removal of the facility, under a catastrophic situation, is financially viable. A copy of the bond is included in Appendix D. Other procedures proposed to protect the public and navigation will follow those already practices by the US Army Corps of Engineers. The plans also list other parties including local emergency response teams that will be contacted as appropriate if adverse conditions should occur at the project.

Appendix E includes the updated environmental monitoring plan which was demonstrated at the facility with an operating tidal turbine in June 2021. This monitoring plan will be approved by the US Army Corps of Engineers in its role regarding federal oversight for the protection of the environment and navigation. The applicant will continue to work with resource agencies to adjust the monitoring plan as experience is accrued.

In addition, existing permits issued by the US Army Corps of Engineers, Massachusetts Department of Environmental Protection, and the Town of Bourne Conservation Commission

approved the installation of the test platform and its operation. These permits addressed safe management, operation and maintenance of the project. MRECo expects that the requirements of these permits will be incorporated into the FERC License. As stated above, the USACE Section 408 Real Estate License requires MRECo to provide assurances for the removal of the test platform and restoration of the site, a condition which has now been met.

# Exhibit E – Environmental Assessment

# **Bourne Tidal Test Site**

Prepared by:

**Stephen Barrett** 

PO Box 1004

Concord, MA 01742

and

Marine Renewable Energy Collaborative of New England

PO Box 479

Marion, MA 02738

September 6, 2021

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# Acronyms and Abbreviations

AC**Alternating Current** BTTS **Bourne Tidal Test Site** 

**BUAR** Board of Underwater Archaeology

CCC **Cape Cod Commission** 

CFR Code of Federal Regulations

CLC Cape Light Compact

CMR Code of Massachusetts Regulations

C. 91 Chapter 91 Program

CZMA Coastal Zone Management Act CZM Coastal Zone Management

DC **Direct Current** 

DEP Department of Environmental Protection

DMF **Division of Marine Fisheries** DOD Department of Defense **DPLA** 

**Draft Pilot License Application** EΑ **Environmental Assessment** 

EFH **Essential Fish Habitat** 

EIS **Environmental Impact Statement EPA Environmental Protection Agency FERC** Federal Energy Regulatory Commission

ILP **Integrated Licensing Process** 

kW **Kilowatt** 

MA F&G Massachusetts Fish and Game

MA Massachusetts

MSA Magnuson-Stevens Fishery Conservation and Management Act

MGL Massachusetts General Law

MHC Massachusetts Historical Commission Marine Renewable Energy Collaborative MRECo

MW Megawatt

Natural Heritage and Endangered Species Program **NHESP** 

**NMFS** National Marine Fisheries Service ORPC Ocean Renewable Power Company PCN **Pre-Construction Notification** State Historic Preservation Office SHPO **STEM** Science Technology Engineering Math **THPO Tribal Historic Preservation Office USFWS US Fish and Wildlife Services** 

**US Am Corps of Engineers** USACE WPA Wetlands Protection Act

# **Executive Summary**

The Bourne Tidal Test Site (BTTS) is the first tidal energy test site in the U.S. The test stand was installed in December 2017 and it has since been used by commercial and academic interest to test marine sensors and oceanographic equipment. In June 2021, a tidal turbine manufactured by Littoral Power Systems became the first tidal turbine test at the facility.

As a pre-permitted site capable of supporting in-water tidal turbine testing, the BTTS has garnered a significant amount of interest. However, feedback has indicated that developers require a facility that is interconnected with the electrical grid to demonstrate gridcompatibility. The distribution of tidal electricity into the grid requires a license from the Federal Energy Regulatory Commission (FERC).

The BTTS is located in the Cape Cod Canal adjacent to the US Army Corps of Engineers (USACE) Cape Cod Canal District Office – the USACE is responsible for operating and maintaining the canal. The facility is approximately 83 feet west of the Railroad Bridge (also operated by USACE) and 71 feet from the shoreline and the Canal District Office.

The BTTS principally consists of an existing platform mounted to two primary piles with support from a third pile all constructed in Phase I. The vertical turbine mounting arm is attached to the platform and held in place by a cross beam between the two primary piles spaced 23 feet apart from center. The piles rise approximately 45 feet above the seabed and are embedded to a depth of 50 feet below the seabed. Each pile is 18 inches in diameter and consists of ½ inch steel. The area of seabed impacted by the footprint of the facility is less than 5 square feet. A third support pile is located to the west of the platform and connected to the two primary piles by additional crossbeams. The turbine mounting pole has a lift which is powered by an electric winch for lowering and raising tidal turbines from submergence.

Turbines proposed for testing are not specifically limited by design but are limited in size because a turbine must fit within the test window of the platform mounting piles, approximately seven meters. Given current technology, all devices tested will generate less than 50 kW at peak output. The Draft Pilot License Application (DPLA) includes a comprehensive list and description of turbine classes and types proposed for testing (Appendix E, Attachment A) as well as a list of actual developers that have contacted MRECo about testing appropriate technology at the BTTS (Appendix F). The proposal includes a comprehensive environmental monitoring plan to ensure that potential environmental effects are limited in an adaptive management manner as necessary. Operating in a "test" environment will also enhance control of the process and allow the managers to stop the test if effects are observed, a condition that is not feasible for a commercial installation.

In the proposed Phase II, a new electricity distribution line will be constructed to connect the BTTS with the wider electrical grid. An overhead line will extend from the facility above the water about 100 feet to shore connecting to a new utility pole on land owned and operated by USACE – no work in the ocean associated with a submarine cable is necessary. Existing, outdated (former telegraph) utility poles located adjacent to the railroad tracks, which presently carry high speed internet owned and managed by Open Cape, will be removed. Seven new electrical utility poles, approximately 40 feet in height, will be installed in the existing railroad right-of-way between the BTTS and the closest existing electricity carrying utility pole at the end of Taylor Road. A three-phase overhead line with a capacity of 13.2 kV will be installed on top of the utility poles to allow the BTTS to export electricity generated from test turbines to the electric grid. The existing Open Cape high speed internet lines will also be hung along the new utility network providing a data connection for the platform.

A new inverter will convert the generated power from DC to AC. It will be supplied on three phase power at 150 AMPS and 277/480 voltage. A new bidirectional meter will be installed at the interconnection point on Taylor Road along with an AC disconnect. The interconnection of the facility to the electrical grid requires a FERC license.

The analysis assumes that a grid interconnection licensed by FERC will increase turbine testing during the year by a factor of five. Considering that annual tidal testing is limited by weather

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conditions, the no build assumes turbines operating for one month while the proposed alternative assumes turbines operating for five months.

Given that the no-build alternative includes the existing BTTS platform, alternatives to the proposed project are limited to different means for connecting the BTTS to the electric grid. The current interconnection proposal is the shortest route between the BTTS and an electrical grid point of interconnection, avoids in-water work, and utilizes existing infrastructure to the maximum extent. A former proposal included running the electric cable from the BTTS to the railroad bridge thereby decreasing the distance of an overhead line from about 83 feet to 71 feet. However, the USACE, which owns and operates the railroad bridge, determined that it preferred an alternative where the cable would not be attached to the bridge.

In terms of public participation, the design and approval of the BTTS prior to its installation in December 2017 involved a significant amount of stakeholder engagement. The DPLA includes all of the permits and approvals received (Appendix B) as well as a consultation record (Appendix A). This information shows that local, state and federal agencies approved the construction and operation of the non-grid tied facility subject to conditions which were followed during construction. Post-construction, federal and state marine resource agencies continued to express interest in an environmental monitoring program to ensure that the operation of the test site will not produce adverse environmental impacts. An environmental monitoring plan is included in this application as Appendix E which addresses comments provided by regulatory agencies. The monitoring plan was demonstrated with a tidal turbine operating at the BTTS in June 2021.

Beyond the environmental regulators, interest in the facility has been overwhelmingly positive. The State and Federal legislators, the Town of Bourne and the MA Department of Economic Development have expressed strong support given the potential of the facility for increasing economic development. Individuals from academic institutions including the Woods Hole Oceanographic Institution and the University of Massachusetts (UMASS) to regional

STEM Programs in public schools have expressed support for the facility and its potential as a laboratory and educational center.

Issues raised in many other types of projects including visual impairment and historic character impacts have been non-existence for the BTTS project. This is primarily because the facility blends into the maritime operations associated with the canal and railroad bridge, while proposed facilities such as the utility poles and lines will be replacing existing lines. In addition, there are no residential neighbors that are close enough to the project to have a visual, noise, or other type of impact. The project site is not safe for fishing and boating because of its proximity to the Railroad Bridge and shoreline and therefore the facility does not displace any existing public uses.

The proposed BTTS site is superior to the alternative sites for many reasons most fundamental of which is that the BTTS platform has already been constructed in the water and approved by federal, state and local regulatory agencies and has operated in a non-grid fashion without incident for nearly four years. Potential impacts from the BTTS operations would be similar in other locations and can be managed through the implementation of the safeguarding and environmental plans proposed.

#### Introduction 1.0

#### **Application** 1.1.

This Environmental Assessment (EA) is filed by the Marine Renewable Energy Collaborative of New England (MRECo), a nonprofit organization whose mission is to promote the sustainable development of renewable energy in New England ocean waters, for the Bourne Tidal Test Site (BTTS).

On September 6, 2021, MRECo submitted a Notice of Intent with the Federal Energy Regulatory Commission (FERC or the Commission) to file an application for a hydrokinetic pilot project license for the Bourne Tidal Test Site Project located in the Cape Cod Canal in the Town of Bourne, Massachusetts. The application has been filed according to the Commission's guidance provided in the whitepaper "Licensing Hydrokinetic Pilot Projects" dated April 14, 2008 and in accordance with FERC regulations (18 CFR §5). As part of the requirements for approval to use FERC's expedited review process for hydrokinetic pilot projects, MRECo has also filed a request for waivers of certain pre-filing requirements of the Integrated Licensing Process, an assessment of how the Project meets the Commission's pilot project criteria, a process plan and schedule reflecting both licensing of the Pilot Project and transition from the Pilot Project to the larger proposed commercial build-out, and a Draft Pilot License Application (DPLA) prepared under the requirements of 18 CFR \{5\) and the FERC hydrokinetic pilot project whitepaper.

The proposed BTTS project is located in the Cape Cod Canal, Barnstable County, Bourne, Massachusetts. The project is comprised of (1) a testing platform, permitted and installed in December 2017, and operated since then for testing a tidal turbine and oceanographic sensors and instrumentation, and (2) a new electricity distribution line to connect the existing platform with the electrical grid. A locus map of the project site is shown in Figure E-1.

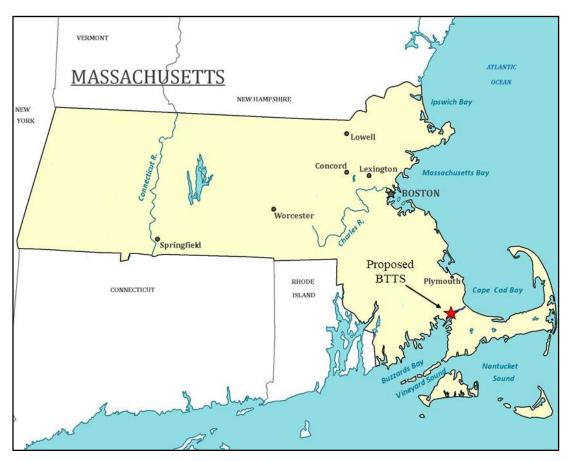


Figure E-1. BTTS Project Locus

The project is envisioned to consist of a single test site sized to accommodate testing a single individual turbine with a peak output rating of about 50 kW. The types of turbines tested will be dependent on industry needs, but they will be limited by size and space at the platform. If deployed for an entire year, such a turbine would produce approximately 175 MWh of electricity in a year. As the turbine testing will be conducted in a controlled testing regime, the actual amount of electricity produced will be a function of time deployed in the water.

The Project is located on submerged lands under ownership and control of the US Army Corps of Engineers (USACE) for safe marine navigation classified as "public lands" as defined in the Federal Power Act. A Section 408 real estate license has previously been issued for the platform by the USACE (please refer to DPLA, Appendix B to view copies of licenses issued)

and a long-term request to extend this license has been requested as part of the current permitting effort.

# 1.2 Purpose of Action and Need for Power

## 1.2.1 Purpose of Action

The Commission must decide whether to issue a license to MRECo for the project and what conditions should be placed in any license issued. In deciding whether to issue a pilot license for a hydrokinetic power project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued (e.g., research, technology development), the Commission must give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality.

Issuing a new pilot license for the BTTS Project would allow MRECo to generate tidal test turbines in a grid-connected system, and export electricity generated to the electrical grid for the term of a pilot license of 8 years, making electric power from a renewable resource available to the utility's customers. While tidal turbine testing in a non-grid condition is authorized by existing license and approvals (see DPLA, Appendix B), providing developers with a grid-connection will increase demand for and use of the BTTS. The analyses presented herein assume that a grid-connection will increase tidal testing five-fold. Considering that annual tidal testing is limited by weather conditions, the no build assumes turbines operating for one month while the proposed alternative assumes turbines operating for five months.

This draft EA assesses the effects associated with operation of the project, alternatives to the proposed project, and makes recommendations to the Commission on whether to issue a new license, and if so, recommends terms and conditions to become a part of any license issued.

In this draft EA, we assess the environmental and economic effects of continuing to operate the project (1) as proposed by MRECo; and (2) with our recommended measures. We also

consider the effects of the no-action alternative. Important issues that are addressed include fish habitat, threatened and endangered species, and recreational access.

# 1.2.2 Need for Power

The BTTS Project would create the first grid-connected tidal energy testing facility in the US which would allow for the systematic testing of tidal turbines. In addition, the BTTS will demonstrate how tidal energy can be supplied to the electric grid, and lead to the development of similar installations around the world.

A significant obstacle to the development of the US tidal energy industry has been the lack of an established, pre-permitted tidal test site where developers can deploy devices to study their performance and potential environment effects. The purpose of the platform is to provide tidal turbine technology developers with a pre-permitted site in a real-time tidal environment for testing engineering and environmental aspects of tidal energy generators with a nameplate capacity of up to 50 kW. The project has received funding from the Commonwealth of Massachusetts through the Seaport Economic Council and the Massachusetts Clean Energy Center.

We conclude that power from the BTTS Project would help meet a need for improving tidal energy technology development and demonstrating its compatibility with the electricity grid. The need for the project is evident through the participation of local and state agencies that recognize the potential for economic development associated with the test center. In addition, the power exported to the grid will displace the operation of fossil-fueled facilities, avoid some power plant emissions, and create an environmental benefit.

# 1.3 Statutory and Regulatory Requirements

A license for the BTTS Project is subject to numerous requirements under the Federal Power Act (FPA) and other applicable statutes. The major regulatory and statutory requirements are summarized in Table E-1 and described below. This section briefly describes the statutory and regulatory requirements that must be addressed as part of the licensing process.

Table E-1. Tidal Test Structure and Platform Regulatory Approvals

Requirement	Agency	Status
Section 4(e) of the Federal Powers Act	FERC	Section 408 Real Estate License issued by the USACE in September 2017 and extended through December 2020. An application for a new long-term license was filed in March 2021.
Section 10(j) Recommendations, Federal Powers Act	FERC	Recommendations have been submitted to FERC by NMFS, USFWS, DMF, and NHESP. See Appendix A of the DPLA, Consultation Record. These recommendations have been incorporated into the proposed project.
Section 408 Policy	USACE	Section 408 Real Estate License issued by the USACE in September 2017 and extended through December 2020. An application for a new long-term license was filed in March 2021.
Rivers and Harbors Act, Section 10	USACE	Regulatory Permit issued by the USACE in September 2017 and extended through December 2020. An application for a new long- term permit was filed in March 2021.
Essential Fish Habitat, Magnuson-Stevens Act	USACE, NMFS	USACE has consulted with NMFS prior to issuance of previous regulatory permit between 2017 and 2020. Concurrence subject to finalization of environmental monitoring plan.
Endangered Species Act Consultation	USACE, NMFS, USFWS, MADEP, NHESP	Concurrence provided subject to specific operational limitations on size and speed of turbines and conditioned on monitoring requirements for each test.
Section 401 Water Quality Certification, Clean Water Act	USACE, USEPA, MADEP	Project did not require any discharge of dredged or fill material. Determined that project is not subject to State Review.
Coastal Zone Management Act Consistency	MA CZM	Concurrence issued on each USACE permit and license action. Expecting concurrence review for long-term license filed in March 2021.
Massachusetts General	MA DEP, MA	A 30-year Chapter 91 license was issued for the

Laws, Chapter 91 Public Waterfront Act	DMF, NHESP	BTTS on June 24, 2021.
Massachusetts General Laws, Chapter 131, Wetlands Protection Act	Town of Bourne, MA DEP, MA DMF, NHESP	An Order of Conditions was issued jointly by the Town of Bourne Conservation Commission and the MA DEP on November 3, 2016
Massachusetts General Laws, Chapter 40, Private Use of State Property	MA DOT	An application has been filed to approve the placement of new utility poles on MA DOT property adjacent to the Cape Cod railroad tracks
National Historic Preservation Act, Section 106	SHPO, THPO, BUAR	Agencies consulted prior to issuance of USACE Regulatory Permit in September 2017 and extended through December 2020.

## 1.3.1 Federal Power Act

## Section 4(e) Conditions

Section 4(e) of the FPA provides that any license issued by the Commission for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation.

The USACE owns and manages federal lands of the Cape Cod Canal. The existing platform is located in the canal and attached to the seabed. One of the proposed new utility poles will be located on land owned and managed by the USACE adjacent to the canal. The USACE issued a Section 408 Real Estate license in October 2017 (with subsequent extensions) authorizing the use of federal lands for the construction and operation of the BTTS platform. Conditions of the license included securing a performance bond for the removal of the facility if necessary. Appendix D of the DPLA includes a Project Removal and Restoration Plan along with a copy of the performance bond secured by the applicant adequate to meet the USACE conditions. An application for a long-term Section 408 license was submitted to the USACE in March 2021. The applicant expects that conditions of the Section 408 license will be incorporated into a FERC license.

## Section 10(j) - Recommendations

Under section 10(j) of the FPA, each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project. The Commission is required to include these conditions unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

MRECo submitted a DPLA to FERC on the BTTS on November 5, 2018. FERC issued a letter rejecting the DPLA on January 11, 2019. NMFS, USFWS, MA DMF, and MA NHESP filed comment letters in December 2018 during the public comment period. Copies of these letters are included in the DPLA, Appendix A, Consultation Record. Appendix A documents additional consultation with these agencies from 2019 to 2021 with specific regard to addressing the comments and preparing an environmental monitoring plan. This DPLA has incorporated the comments previously submitted.

# 1.3.2 USACE: Section 10 of the Rivers and Harbors Act, Section 408 Program Section 10

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) prohibits the unauthorized obstruction or alteration of any navigable water of the United States. This section provides that the construction of any structure in or over any navigable water of the United States, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of such waters is unlawful unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army.

The USACE issued a regulatory permit for the construction and operation of the BTTS on December 28, 2016. It issued subsequent permits on October 9, 2018, June 15, 2020, and October 5, 2020. See DPLA Appendix B, Permits and Approvals.

#### Section 408

Through the Civil Works program, the USACE provides the Nation with quality and responsive management of the Nation's water resources. As a result, USACE, in partnership with stakeholders, has constructed many Civil Works projects across the Nation's landscape. In order to ensure that these projects continue to provide their intended benefits to the public, Congress mandated that any use or alteration of a Civil Works project by another party is subject to the approval of USACE. Section 408 provides that USACE may grant permission for another party to alter a Civil Works project upon a determination that the alteration proposed will not be injurious to the public interest and will not impair the usefulness of the Civil Works project.

The BTTS was proposed in the Cape Cod Canal, a Civil Works project. The USACE issued a Section 408 Real Estate License to MRECo on September 26, 2017, and subsequently on November 7, 2018, May 12, 2020, and October 6, 2020. An application for a long-term license was submitted to the USACE on March 15, 2021.

1.3.3 Magnuson-Stevens Fishery Conservation Management Act, Essential Fish Habitat "Essential fish habitat" or EFH is defined under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and refers to waters and substrate necessary for fish to spawn, breed, feed or grow to maturity. Essential fish habitats are those necessary to maintain fish production consistent with a sustainable fishery and the managed species' contribution to a healthy ecosystem. The MSA provides for conservation and management of Federal fisheries and requires Federal fishery management plans to describe and identify essential fish habitat for managed fish species, to minimize to the extent practicable adverse effects on such habitat caused by fishing, and to identify other actions to encourage the conservation and enhancement of such habitat.

In issuing its regulatory permits for the construction and operation of the BTTS, the USACE consulted with the NMFS on project effects on essential fish habitat and recommended conservation measures. The proposed project has incorporated recommendations provided by NMFS including an environmental monitoring plan provided in the DPLA, Appendix E. Our analyses of project impacts on essential fish habitat are presented in section 3.3.1, Aquatic Resources.

## 1.3.4 Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. A list of federally listed species that may occur in the project area is provided in **Table** E-2. Our analyses of project impacts on threatened and endangered species are presented in section 3.3.2, Threatened and Endangered Species.

Table E-2. Federally-listed Threatened and Endangered Species

Species Common Name	Species Scientific Name	Status
North Atlantic Right Whale	Eubalaena glacialis	Endangered
Humpback Whale	Megaptera novaeangliae	Endangered
Fin Whale	Balaenoptera physalus	Endangered
Leatherback sea turtles	Dermochelys coriacea	Endangered
Kemp's ridley turtle	Lepidochelys kempi	Endangered
Loggerhead turtle	Caretta caretta	Threatened
Green sea turtles	Chelonia mydas	Threatened
Hawksbill sea turtle	Eretmochelys imbricata	Endangered
Atlantic sturgeon	Acipenser oxyrinchus	Threatened

Section 7 Consultation has been conducted associated with the Section 10 regulatory permits issued by the USACE between September 2017 and December 2020. Evidence of consultation is provided in the DPLA, Appendix A, Consultation Record. In a letter dated February 23, 2017, NMFS issued concurrence of the USACE determination that the project is not likely to adversely affect threatened and endangered species and stated that no further consultation would be required. The concurrence was conditioned on the following turbine operations and specifications (see NMFS letter February 23, 2017):

There will be one turbine in operation at a time. The turbine type that will be used initially is a horizontal axis open-bladed turbine with a 3-meter diameter swept area. This would equate to a frontal area of 7-square-meters and a tip speed of 15 rpm, which equates to 2.4 m/s. However, the structure is able to support alternative technologies, which may result in broader limits, and the developers may test alternative technologies. Therefore, they have requested that the permit allow testing of any turbine that is  $\leq$ 4 meters, has a frontal area ≤7 square meters and tip speeds ≤20 rpm, which equates to 3.1 m/s. These limitations are based upon the water velocities in the CCC routinely reaching 2.5 meters per second. The tidal turbines that will be tested are designed for high torque, low velocity generation.

The applicant will ensure that testing activities will meet these specifications. No additional authorization is required to interconnect the facility to the electric grid.

#### 1.3.5 Clean Water Act

Under section 401 of the Clean Water Act (CWA), a license applicant must obtain certification from the appropriate state pollution control agency verifying compliance with the Clean Water Act if the applicant is discharging dredged or fill material into Waters of the United States. MRECo permitted the installation of the BTTS in 2016 and 2017. The USACE issued a regulatory permit in its authority under the Rivers and Harbors Act due to the proposed location of new structures in Navigable Waters of the United States. However, because the project involved only installing piles in the seabed, and not the discharge of dredged or fill material, a Clean Water Section 404 Permit was not required. This action demonstrates that Clean Water Act Section 404 and Section 401 are not triggered by the project. No additional

authorization is required to interconnect the facility to the electric grid.

### 1.3.6 Coastal Zone Management Act

Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C.  $\ni$ 1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification. The National Oceanic and Atmospheric Administration (NOAA) first approved the Massachusetts Coastal Zone Management (MCZM) Plan in April 1978 and the plan has been updated through subsequent filings most recently in 2011.

MCZM initially issued concurrence on the USACE regulatory permit on December 28, 2016. Its concurrence was issued for each of the subsequent permits issued by the USACE on October 9, 2018, June 15, 2020, and October 5, 2020. See DPLA Appendix B, Permits and Approvals. No additional authorization is required to interconnect the facility to the electric grid.

#### 1.3.7 National Historic Preservation Act

Section 106 requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (National Register).

As part of the original application to the USACE for a Section 10 Regulatory Permit to construct and operate the BTTS, notification was sent to the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officers (THPO), and the Board of Underwater Archaeology (BUAR). A response was provided by the BUAR indicating no potential effect on underwater archaeological resources. The USACE determined that its action met the requirements of Section 106 of the National Historic Preservation Act. Subsequent applications to and permits issued by the USACE reached the same conclusion. Our analyses of project impacts on historic resources are presented in section 3.3.4, Cultural Resources. No additional authorization is required to interconnect the facility to the electric grid.

## 1.3.8 M.G.L. Chapter 91, Public Waterfront Act

Through the Public Waterfront Act and Chapter 91 Waterways Program, the Commonwealth of Massachusetts seeks to preserve and protect the rights of the public, and to guarantee that private uses of tidelands and waterways serve a proper public purpose. While other agencies play a role in preserving public rights in public trust lands, the Waterways Regulation Program, the section of MassDEP that oversees Chapter 91, is the primary division charged with implementing the "public trust doctrine." MA DEP requires projects for new structures within private tidelands or waterways to obtain a waterways license or permit. The application process requires notification to the MA DMF and MA NHESP where projects are located in marine waters and in state-listed species habitat, respectively. Our analyses of project impacts on aquatic resources and recreation are presented in sections 3.3.1 and 3.3.3 respectively.

The MA DEP issued a Waterways Permit for the BTTS on December 22, 2016 and approved a one year extension on October 31, 2017. MRECo applied for a 30-year Chapter 91 License which was issued on June 24, 2021. No additional authorization is required to interconnect the facility to the electric grid.

#### 1.3.9 M.G.L. Chapter 131, Wetlands Protection Act

The Wetlands Protection Act (Massachusetts General Laws (MGL) Chapter 131, Section 40) protects wetlands and the public interests they serve, including flood control, prevention of pollution and storm damage, and protection of public and private water supplies, groundwater supply, fisheries, land containing shellfish, and wildlife habitat. These public interests are protected by requiring a review of proposed work that may alter wetlands. The law protects not only wetlands, but other resource areas, such as land subject to flooding (100-year floodplains), the riverfront area (added by the Rivers Protection Act), and land under water bodies, waterways, salt ponds, fish runs, and the ocean. Applicants seeking to conduct work in wetlands resource areas subject to protection must file a Notice of Intent with the municipal conservation commission and the MA DEP. Both bodies may jointly approve the work if found

to be in compliance with the Wetland Protection Act performance standards. The application process requires notification to the MA DMF and MA NHESP where projects are located in marine waters and in state-listed species habitat, respectively. Our analyses of project impacts on aquatic resources is presented in section 3.3.1 and on threatened and endangered species in section 3.3.2.

The Bourne Conservation Commission and the MA DEP issued an Order of Conditions approving the construction and operation of the BTTS on November 3, 2016. No additional authorization is required to interconnect the facility to the electric grid.

#### 1.3.10 Private Use of State Lands

The Massachusetts Department of Transportation (DOT) Public/Private Development Unit (PPDU) encourages economic development in the Commonwealth while preserving and enhancing the state transportation system. To that end, PPDU facilitates the environmental review and permitting of the transportation-related elements of private development projects in need of access to the state transportation system.

MRECo requires an approval from the PPDU to place six utility poles on state land adjacent to the Cape Cod Railroad. An application was filed in June 2021.

#### 1.4 Public Review and Comment

The Commission's regulations (18 CFR, sections 5.1-5.16) require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Rivers and Harbors Act, the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, the National Historic Preservation Act, and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission's regulations.

#### 1.4.1 Scoping

Before preparing this draft EA, MRECo followed the federal, state, and local permitting processes required for the construction and operation of the non-grid connected BTTS. The project scope was defined by that process.

Scoping occurred on each of these three levels prior to project construction. At the federal level, the USACE consulted with resource agencies prior to issuance of a regulatory permit in September 2017 under its authority associated with the Rivers and Harbors Act. It has subsequently consulted with resource agencies in issuing extended permits in October 2017, May 2020, and October 2020, as well as for the approval of the demonstration of the environmental monitoring plan in June 2021. At the state level, the MA DEP consulted with resource agencies prior to issuance of a Chapter 91 Permit in December 2016, an extension of the Chapter 91 Permit in October 2017, and issuance of a 30-year Chapter 91 license in June 2021. At the local level, the Bourne Conservation Commission supported by the MA DEP consulted with resource agencies prior to issuance of an Order of Conditions in November 2016. Appendix A, Consultation Record, includes copies of comment letters submitted as part of the process and prior to issuance of individual permits. Appendix B, Permits and Approvals, includes copies of all of the permits and licenses issued by regulatory authorities.

Following the issuance of FERC's letter rejecting the DPLA on January 11, 2019, MRECo convened two conference calls with the resource agencies to discuss the comments filed with FERC. Following the first meeting on March 25, 2019, MRECo responded to comments in the letters submitted by resource agencies during the DPLA comment period in a memo dated May 29, 2019. A subsequent conference call was conducted on June 25, 2019 to review the responses. Meeting notes from the two conference calls and the response to comments memorandum dated May 29, 2019 are provided in DPLA, Appendix A, Consultation Record.

Consultation since the filing of the DPLA has focused on preparing an environmental monitoring plan to assess potential impacts of the tidal turbine testing on marine life. This included submission of a draft monitoring plan dated March 31, 2020, a conference call convened by the USACE to review the monitoring plan on April 14, 2020, and subsequent updates to the monitoring plan in association with USACE consultation for regulatory approvals to operate the BTTS in May and October 2020. In addition, MRECo submitted an augmented monitoring plan prior to a request to approve the installation of a tidal turbine and demonstration of the environmental monitoring plan in May 2021. The USACE issued a permit approving the test and incorporated conservation measures provided by resource agencies including requirement for video data collection and submission of a final report. The updated environmental monitoring plan and a final report on the demonstration program prepared by scientists at the UMASS at Dartmouth are included in the DPLA, Appendix E.

#### 1.4.2 Interventions

This section of the EA will be prepared by Commission staff after a final application is filed and a notice seeking interventions is issued.

## 1.4.3 Comments on the Application

There have been two distinct application processes when public comments have been solicited for this project. The first opportunity was in 2016-17 when MRECo applied for federal, state, and local permits to install and operate the BTTS in the Cape Cod Canal in a non-grid connected condition. A list of comments submitted by letter or email as part of this permit application process is included in **Table E-3**.

**Comments on Non-Grid Connected BTTS Permit Applications** Table E-3.

Date	Agency / Interest	Form	Purpose
8/30/2016	BUAR	Letter	USACE PCN Review SHPO
8/31/2016	Town of Bourne, DEP, DMF, NHESP	Letter	MA WPA Application
10/6/2016	DMF	Letter	MA WPA Review Comment
11/3/2016	MA NHESP	Letter	MA WPA Review Comment
1/17/2017	CZM Concurrence	Email	Concurrence USACE PCN Review
2/23/2017	NMFS	Letter	USACE PCN Review Section 7

The second opportunity was when FERC requested public comments on the grid-connected BTTS after MRECo filed a DPLA for the project in November 2018. Agencies that commented on the DPLA are listed in Table E-4.

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Table E-4. Comment Letters on BTTS DPLA Submitted November 5, 2018

Commenting Entity	Date Filed
National Marine Fisheries Service	December 19, 2018
US Fish and Wildlife Service	December 20, 2018
MA Division of Marine Fisheries	December 19, 2018
MA Natural Heritage and Endangered Species Program	December 18, 2018

#### **Alternative Including Proposed Action** 2.0

The purpose of this section is to present the project and the alternatives to the project. The first section is the no action alternative which describes condition if this project were not licensed by the Commission and implemented by the applicant. The second section is the proposed project requesting a license. The third section reviews other viable alternatives.

#### No Action Alternative 2.1

The no-action alternative constitutes a baseline from which the proposed action and alternatives can be compared and assessed in the environmental document. Under the noaction alternative, the project would continue to operate under the terms and conditions of the current permits and licenses. Thus, the no-action alternative would include the existing facilities and current project operation.

### 2.1.1 Existing Project Facilities

Existing facilities include the BTTS in the non-grid configuration. This includes the existing three-pile structure, platform, and lifting arm. Power to operate the platform is provided by a generator as supplemented by a solar panel. Internet communications can be conducted using existing wireless technology.

#### 2.1.2 Project Safety

The project has been operating safely for nearly four years under the existing permits and licenses from federal state and local authorities. MRECo has coordinated with USACE on all individual testing programs and staff working on the platform follow federal work safety procedures. An Operations and Maintenance Plan is included in the DPLA, Appendix C and Safeguarding Plans are provided in Appendix D.

#### 2.1.3 Existing Project Operation

The BTTS has been used as a fixed site for marine research and technology testing in a nongrid connected capacity since December 2017. Tests conducted on the platform have included marine sensors and instrument, such as acoustic doppler current profiler (ADCP), water quality sensors, and a microplastics analyzer. In June 2021, a tidal turbine was tested and the

environmental monitoring program was demonstrated using video and acoustic imaging to assess the potential environmental impacts from the turbine. The no action condition assumes that tidal testing will be conducted for one month during the year. Other testing of non-grid connected marine sensors and instrumentation will also continue to be tested.

There are no on-land facilities in use. However, MRECo has authorization from the USACE to observe activities from its property near the railroad bridge and occupy the waters with work boats in the area around the BTTS.

### 2.1.4 Existing Environmental Measures

Staff working on and around the BTTS during testing programs are aware of their location in the marine environment and record observation notes of any marine animals in the area. The USACE, as operators of the Cape Cod Canal, also have practices in place for observing and communicating the presence of threatened and endangered species in the canal and the BTTS activities work within this system. In addition, the environmental monitoring program was demonstrated in June 2021 and such a program will continue to be a part of any activities associated with tidal turbine testing even in the no-action alternative.

#### 2.2 **Proposed Action**

This section describes proposed changes to the project, including changes in project facilities and operation, new environmental measures, and any proposed modifications to the project boundary.

#### 2.2.1 Proposed Project Facilities

Proposed facilities are those required to connect the existing BTTS to the electrical grid.

A new electricity distribution line will be constructed to connect the BTTS with the wider electrical grid. High speed internet owned and managed by Open Cape, which is currently installed on outdated (former telegraph) utility poles, will also be installed on the poles.

Seven new electrical utility poles, approximately 40 feet in height, will be installed in the existing railroad right-of-way between the BTTS and the closest existing electricity carrying utility pole at the end of Taylor Road. The BTTS will be connected to land by a conventional overhead electrical distribution line to a new utility pole on USACE property approximately 100 feet from the platform. The project requires no underwater or in-water construction work.

The remaining six utility poles will be located adjacent to the Cape Cod Railroad tracks on land owned and operated by the MA DOT. A three-phase overhead line with a capacity of 13.2 kV will be installed on top of the utility poles to allow the BTTS to export electricity generated from test turbines to the electric grid. The existing Open Cape high speed internet lines will also be installed along the new utility network providing a data connection for the platform.

Turbine manufacturers will be responsible for converting the power output to DC. A new inverter will convert the generated power from DC to AC. It will be supplied on three-phase power at 150 AMPS and 277/480 voltage. A new bidirectional meter will be installed at the interconnection point on Taylor Road along with an AC disconnect. Then it will be stepped up to interconnect to the grid.

MRECo has filed an interconnection application with the EverSource, the utility that owns and operates the electric grid in Bourne. The final design will be subject to EverSource's review and approval.

#### 2.2.2 Proposed Project Operation

Existing permits and authorizations allow for tidal turbine testing in a non-grid condition. However, developers seek a facility with a grid connection in order to demonstrate that their technologies are grid-compatible. Therefore, it is assumed that the time when turbines are tested will increase five-fold from one month a year in a non-grid condition to five months a year in a grid-connected condition.

While the permits and licenses previously issued authorized construction and operation of the BTTS, including limitations on turbine operating specifications (see below), there were two elements of operation that the applicant seeks to clarify through this application.

The first is that the licenses and approvals for the grid-connected facility authorize testing of a

wide variety of technologies limited by size. NMFS Section 7 concurrence letter dated February 23, 2017 reflects the approval of a variety of turbines and includes specific limitations on design authorized as "not likely to adversely affect" (see DPLA, Appendix A). In Commission's authorization, all devices tested must fit within the test window of the platform mounting piles, approximately seven meters. All devices tested will generate less than 50 kW at peak output. A comprehensive list and description of turbine classes and types proposed for testing is included in DPLA, Appendix E, Attachment A. A list of tidal turbine developers that have contacted MRECo about testing appropriate technology at the BTTS is included in DPLA, Appendix F, BTTS Business Plan. Turbines that vary from the objective turbine of an axial turbine of 3 meters in diameter will be reviewed by the firm that designed the platform to ensure it does not exceed design parameters.

The second is that resource agencies requested in their comments on the original permit applications to construct and operate the BTTS that MRECo develop an environmental monitoring plan. In response, MRECo has prepared an environmental monitoring plan, provided the plan for agency review a minimum of three times since Spring 2020, and demonstrated the plan at the BTTS in June 2021. The applicant understands that such a monitoring plan will be a condition of approval and that data collected from the monitoring will have a wide benefit for public understanding of the potential environmental effects of tidal turbines.

### 2.2.3 Proposed Environmental Measures

The applicant will implement two primary environmental measures.

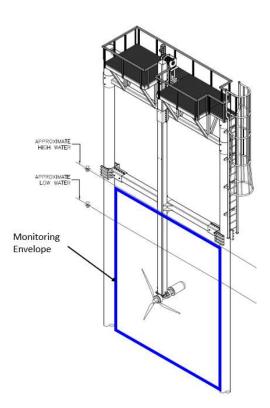
The first is that the NMFS concurred that the operation of the project is not likely to adversely affect threatened and endangered species if operated using the following parameter limitations.

There will be one turbine in operation at a time. The turbine type that will be used initially is a horizontal axis open-bladed turbine with a 3-meter diameter swept area. This would equate to a frontal area of 7-square-meters and a tip

speed of 15 rpm, which equates to 2.4 m/s. However, the structure is able to support alternative technologies, which may result in broader limits, and the developers may test alternative technologies. Therefore, they have requested that the permit allow testing of any turbine that is ≤4 meters, has a frontal area ≤7 square meters and tip speeds ≤20 rpm, which equates to 3.1 m/s. These limitations are based upon the water velocities in the CCC routinely reaching 2.5 meters per second. The tidal turbines that will be tested are designed for high torque, low velocity generation.

Second, the applicant will implement an environmental monitoring plan with the recommendations of resources agencies already incorporated and the plan demonstrated at the project site in June 2021.

The monitoring plan will assess the area immediately upstream of the BTTS. Figure E-2 shows the approximate location of the envelope where turbines will operate.



Monitoring Envelope Area with Representative Turbine Figure E-2

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The methodology, as demonstrated in June 2021, will incorporate three factors. First, an acoustics camera will be used to assess a wide field area to identify potential targets and their movement. Second, a video camera will record activity directly in the area of the monitoring envelope. Third, an observer working on and around the platform will record any species observed from above the water surface. In addition, the USACE, in its authority to operate the Cape Cod Canal, has a communication network when endangered species are located in the canal and the BTTS will be connected to that communication network.

## 2.3 Other Alternatives

Given that the no-build alternative includes the existing BTTS platform, alternatives to the proposed project are limited to different means for connecting the BTTS to the electric grid. The current interconnection proposal is the shortest route between the BTTS and an electrical grid point of interconnection, avoid in-water work, and utilizes existing infrastructure to the maximum extent. A former proposal was to run the electric cable from the BTTS to the railroad bridge thereby decreasing the distance of an overhead line from about 83 feet to 71 feet. However, the USACE, which owns and operates the railroad bridge, determined that it preferred an alternative where the cable would not be attached to the bridge.

#### **Affected Environment** 3.0

In this section, we present: (1) a general description of the project vicinity; (2) an explanation of the scope of our cumulative effects analysis; and (3) our analysis of the proposed action and other recommended environmental measures. Sections are organized by resource area (aquatic, recreation, etc.). Under each resource area, historic and current conditions are first described. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives.

## 3.1 General Description of Project Area

The project is located in the Cape Cod Canal, a man-made, sea-level canal opened in 1914 providing a connection between Cape Cod Bay to the east and Buzzards Bay to the west with no locks, dams, or other obstructions. It is 17.4 miles long, 480 feet wide with a design depth of 32 feet. No reservoir is associated with the Cape Cod Canal. Maximum flow can reach 4-5 knots. As it provides a shorter marine transportation route between New York Harbor to the south and Boston Harbor to the north, it is heavily used by a wide range of vessels.

The hydraulic capacity of the canal is governed by the tidal cycles. During flood tides, water moves through the canal from west to east. During ebb tides, water moves east to west. The BTTS is located on the west side of the Railroad Bridge to capture higher flow velocities during the ebb tide.

# 3.2 Scope of Cumulative Affects Analysis

According to the Council on Environmental Quality's regulations for implementing NEPA (40 CFR, section 1508.7), cumulative effect is 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 regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time, including hydrokinetic power and other land and water development activities.

Based on our review of the license application and agency and public comments, we have identified Essential Fish Habitat (EFH) as having potential to be cumulatively affected by the project in combination with other past, present, and future activities. While the facility can operate in a non-grid connected condition and test some tidal turbines, the FERC license will allow the BTTS to operate more efficiently in testing a wide range of turbine types without securing permits for each deployment. Essential fish habitat was selected because marine transportation, coastal development, and commercial and recreational fishing activities have affected the fish habitat by direct removal, alteration of the water circulation, and degradation of water quality. Other activities that are not part of the existing condition but may be expected to be developed prior to or concurrent with the proposed project include:

- <u>Cape Cod Canal Maintenance Dredging</u>: According to files from the MA DMF, the west channel entrance to the Cape Cod Canal in Buzzards Bay is permitted to be dredged every five years at a site called Gray Gables. The permit has a time-of-year restriction on dredging activity between January 15 and June 30 to protect spawning winter flounder.
- Cape Cod Canal Advance Maintenance Dredging: 130,000 cubic yards of sediment was dredged in the eastern segment of the Cape Cod Canal in the winter of 2015-16 to allow larger vessels to enter the canal.

#### 3.2.1 Geographic Scope

The geographic scope of the analysis defines the physical limits or boundaries of the proposed action's effects on the resources. Because the proposed action would affect the resources differently, the geographic scope for each resource may vary.

For EFH, the scope is limited to coastal and near offshore waters associated with Buzzards Bay, Cape Cod Bay, Massachusetts Bay, Nantucket Sound, and the offshore waters immediately adjacent to these waters. Twenty-seven federally managed species have the

potential to occur within the project areas. These include: Atlantic cod (Gadus morhua), haddock (Melanogrammus aeglefinus), pollock, (Pollachius virens), whiting (Merluccius bilinearis), red hake (Urophycis chuss), white hake (Urophycis tenuis), winter flounder (Pseudopleuronectes americanus), yellowtail flounder (Pleuronectes ferruginea), windowpane flounder (Scopthalmus aguosus), American plaice (Hippoglossoides platessoides), ocean pout (Macrozoarces americanus), Atlantic halibut (Hippoglossus hippoglossus), Atlantic sea scallop (Placopecten magellanicus), Atlantic sea herring (Clupea harengus), monkfish (Lophius americanus), bluefish (Pomatomus saltatrix), long finned squid (Loligo pealei), short finned squid (Illex illecebrosus), Atlantic butterfish (Peprilus triacanthus), Atlantic mackerel (Scomber scombrus), summer flounder (Peprilus triacanthus), scup (Stenotomus chrysops), black sea bass (Centropristus striata), spiny dogfish (Squalus acanthias), bluefin tuna (Thunnus thynnus), little skate (Leucoraja erinacea), and winter skate (Leucoraja ocellata).

While some of the species listed above have greater migration areas (e.g., Bluefin Tuna occur through the Gulf Stream along the eastern continental US), such species are unlikely to occur in the project area and/or are faster moving and widely dispersed minimizing the potential for effect.

#### 3.2.2 Temporal Scope

The temporal scope of analysis includes a discussion of the past, present, and reasonably foreseeable future actions and their effects on essential fish habitat. Based on the term of the proposed pilot license, we will look at 8 years into the future, concentrating on the effects on essential fish habitat. The historical discussion is limited, by necessity, to the amount of available information. We identified the present resource conditions based on the license application and agency comments.

# 3.3 Proposed Action and Action Alternatives

In this section, we discuss the effects of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then discuss and analyze the specific

cumulative and site-specific environmental issues. Only the resources that would be affected, or about which comments have been received, are addressed in detail in this EA. Based on this, we have determined that aquatic resources, threatened and endangered species, recreation, and cultural resources may be affected by the proposed action and action alternatives. We have not identified any substantive issues related to geology, water quality and quantity, terrestrial, land use, aesthetic and socioeconomics associated with the proposed action, and therefore, these resources are not assessed in the EA.

### 3.3.1 Aquatic Resources

The aquatic resources sections includes water and fisheries.

#### 3.3.1.1 Water Resources

#### <u>Affected Environment</u>

Ocean currents in the Cape Cod Canal are governed by the tides. During flood tides, water moves from Buzzards Bay into the canal with currents flowing west to east toward Cape Cod Bay. In ebb tide, water flows in the reverse direction from east to west.

The depth of the Cape Cod Canal Navigation Channel is managed to ensure adequate depth for vessel navigation. The design depth of 32 feet with a channel width of 480 feet. The channel must be dredged periodically to remove sediment, which shoals in particular areas due to current flow.

The project site is west of the Railroad Bridge near the north side of the canal and outside of the managed navigation channel. Bathymetry and current velocity were measured in field surveys conducted in June 2016 as part of the siting of the platform. Water depth at the site of the platform is about 27 feet (8.4 meters).

#### **Environmental Effects**

The potential impacts of the project on oceanography and bathymetry will be localized given the magnitude of water the amount of water that passes through the canal and the relative area of influence from a single tidal turbine. The platform will be equipped with a variety of sensors that will collect information on existing ocean conditions at the site as well as record

any difference associated with the deployment of the tidal turbines.

There will be no effects on water resources from the landside improvements.

#### 3.3.1.2 Fishery Resources

#### Affected Environment

Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and amended by the Sustainable Fisheries Act of 1996, an EFH consultation was necessary prior to the USACE PCN regulatory authorization for the construction and operation of the BTTS.

EFH is broadly defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity." The Cape Cod Canal falls into this category and thus has the potential to provide habitat for fish species in the area.

As stated in NMFS EFH designations, the project area falls within the following 10' x 10' square area bounded by coordinates:

North	East	South	West
41° 50.0′ N	70° 30.0' W	41° 40.0′ N	70° 40.0′ W

Source: http://www.greateratlantic.fisheries.noaa.gov/hcd/STATES4/CapecodtoNH/41407030.html

The USACE recently prepared an EFH Assessment for Maintenance Dredging Project (May 2015). The following is a summary of the relevant information provided for this review.

Twenty-seven federally managed species have the potential to occur within the project areas. These include: Atlantic cod (Gadus morhua), haddock (Melanogrammus aeglefinus), pollock, (Pollachius virens), whiting (Merluccius bilinearis), red hake (Urophycis chuss), white hake (Urophycis tenuis), winter flounder (Pseudopleuronectes americanus), yellowtail flounder (Pleuronectes ferruginea), windowpane flounder (Scopthalmus aquosus), American plaice (Hippoglossoides platessoides), ocean pout (Macrozoarces americanus), Atlantic halibut (Hippoglossus hippoglossus), Atlantic sea scallop (Placopecten magellanicus), Atlantic sea

herring (Clupea harengus), monkfish (Lophius americanus), bluefish (Pomatomus saltatrix), long finned squid (Loligo pealei), short finned squid (Illex illecebrosus), Atlantic butterfish (Peprilus triacanthus), Atlantic mackerel (Scomber scombrus), summer flounder (Peprilus triacanthus), scup (Stenotomus chrysops), black sea bass (Centropristus striata), spiny dogfish (Squalus acanthias), bluefin tuna (Thunnus thynnus), little skate (Leucoraja erinacea), and winter skate (Leucoraja ocellata).

The Canal main channel was originally sampled in the late 1960s by the MA DMF to characterize the biological community which is described in the 1977 Cape Cod Canal Environmental Impact Statement (EIS) (Corps, 1977). Generally, the biological community is a mixture representative of a transitioning between two biogeographic regions, Cape Cod Bay (a Boreal community) and Buzzards Bay (a Virginian community). As would be expected of the Canal environment, the areas of the main channel closest to each end would probably be most representative of that respective community, with the areas closest to the midway point of the land cut being the most mixed.

In March 1991 USACE surveyed the benthic habitat of the western end of the Canal in preparation for the realignment of the approach to the Cleveland Ledge channel that was completed in 1999-2000. Benthic and macrofaunal samples were taken in order to characterize the marine ecosystem. Divers observed no macrofauna at any of the stations. However, some minor epifaunal assemblages were observed on the rocks and boulders that occur sporadically within the area. Benthic samples were also collected by the divers. Dominant organisms included the polychaetes Aricidea jefferysi, Amphitrite ornata, and Podarke obscura as well as the amphipod crustaceans Ampelisca abdita and Corophium acutum.

Bournedale Herring Run's entrance, which is located about 1 mile west of the Sagamore Bridge, maintains access for Alewife and Blueback herring to travel up Herring River (formerly Monument River) to reach Great Herring Pond to spawn. Other fish species which may be found within or near the canal include: striped bass (Morone saxatilis), black sea bass

(Centropristis striata), bluefish (Pomatomus altatrix), mackerel (Scomber scrombrus), bonito (Sarda sarda), tautog (Tautoga onitis), scup (Stenotomus chrysops), cod (Gadus morhua), summer flounder (Paralichthys dentatus), and winter flounder (Pseduopleuronectes americanus). Juvenile cod young of year were collected west of the canal and east of Sandwich Harbor by MA DMF Inshore Trawl Surveys between 1978 and 1999 during the spring collection. There were much lower numbers of juvenile cod collected from deeper waters in the autumn collections (1978-1999) (Howe et al., 2002). No sampling was completed in the waters adjacent to the project.

In general, the status of Atlantic horseshoe crab (Limulus polyphemus) populations along the Atlantic Seaboard is poorly understood due to the limited amount and inconsistency of information collected regarding stock levels. In late spring (May/June) adults migrate into warm and shallow waters to mate and lay eggs. Spawning adults prefer sandy beach areas within bays and coves that are protected from wave energy. The eggs are buried in sand or mud at the edge of the shore during the high spring tides and hatch within a few weeks at the next spring tide. There are recorded spawning sites within Buttermilk Bay, but none within the canal. There is no eelgrass growing within the Cape Cod Canal Federal Navigation Project, but it may be found outside the channel near Hogs Island on the western end of the canal.

Marine habitats associated with the project area are primarily defined by the structure of the sea bottom and the marine energy in the area. The Cape Cod Canal is lined along the shoreline by riprap which is colonized by marine vegetation and animals that are suited for such a substrate. The bottom of the canal includes a compact seabed of sand and gravel along with areas of fine grain sediment where tidal flow is obstructed or limited. The canal is not subject to offshore waves due to its protected location between the peninsula of Cape Cod and he mainland of Massachusetts. The canal waters are characterized by strong currents which scour the seabed and limit the colonization of marine vegetation and animals suited for low energy environments.

Shellfish habitat suitability maps have been prepared by the MA DMF. Suitability maps

include areas known to currently provide habitat for shellfish species of interest as well as areas that could be restored as shellfish habitat in the future. Shellfish habitats in the project area are shown in Figure E-3. The project area where the BTTS platform has been constructed and is currently operating is adjacent to areas identified as suitable for blue mussel. These findings were substantiated by project specific data collection by UMASS as described below.

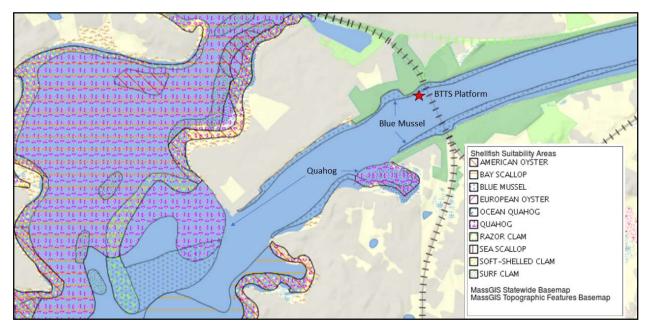


Figure E-3. Shellfish Suitability Map for West Segment of the Cape Cod Canal

Seagrasses are photosynthesizing marine plants that provide habitat structure to a wide array of marine animals. It is typically located in low energy environments in waters 20 feet or less in depth where it can capture sufficient sunlight. Of note, eelgrass in southern New England waters support nursery habitat for bay scallops. No eelgrass is found in the Cape Cod Canal due to the high velocity currents. These findings were substantiated by project specific data collection by the UMASS as described below. There is seagrass mapped near the canal mouth to Buzzards Bay where velocities decrease. These areas are shown in Figure E-4.



Figure E-4. Seagrass Occurrence in the Western Segment of the Cape Cod Canal

To collect information within the project area, MRECo engaged the UMASS School of Marine Science and Technology (SMAST) to conduct a Drop-Camera survey to identify bottom habitats around the BTTS. SMAST lowered a sampling pyramid from a research vessel and collected 15-30 second clips of video of each sampling location. The data was then interpreted in the laboratory to characterize the bottom habitat and other observable information of flora and fauna captured by the video.

The percent coverage and dominate substrate category was calculated for each of the 106 stations (Figure E-5). The substrate around Cape Cod Canal tidal turbine test site was dominated by macroalgae. Several types of red algae (Rhodophyta) and brown algae (Phaeophyta) comprised the majority of algae. Clusters of algae types were apparent. When coralline algae was present, it was the most abundant algae, however was the least common around the test site overall. In general, only stations closer to shore were dominated by mussels or sponges. A cluster of stations south of bridge were dominated by rocks. The dominance of this sediment type suggests the area south of the bridge may provide refuge for small or juvenile fishes from predation or current flow. There were reefing fishes present throughout the survey area, most appeared to be small tautog and cunner. It was difficult to

identify to species level in many instances due to animal size. There were also sea stars and crabs present at very low densities. No species of concern that would impede the deployment of a tidal turbine were observed.

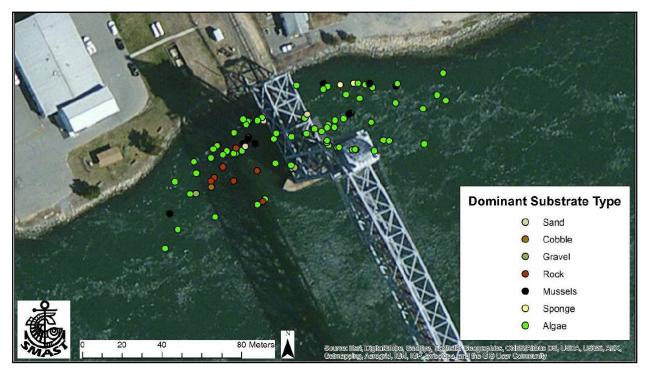


Figure E-5. Bottom Habitat Characterization Near BTTS Platform

#### **Environmental Effects**

While the BTTS platform has been installed and is authorized to test tidal turbines under previous federal, state and local permits, clarification provided through the FERC licensing process and increased testing activity resulting from a grid-connected test facility may elevate the potential environmental effects of the project from the baseline condition. In this analysis, it is projected that tidal turbines will operate for five months of the year in the proposed condition compared with one month a year in the baseline condition.

There have been numerous studies of the potential environmental effects of tidal energy (Ward et al. 2010). The environmental stresses associated with the deployment of the tidal energy turbine facility that could produce an effect on species and habitat are tidal turbine noise and blade strike.

#### <u>Tidal Turbine Noise</u>

The characteristics of noise, its spectra and level, are important factors that influence the potential for the noise to injure fish (Halvorsen et al, 2011). The frequency range of the tidal turbine noise includes the audiogram (frequency range of hearing) of most fish.

Hastings and Popper (2005) conducted a review of sound effects on fish, primarily related to pile driving. Results of these studies indicated that fish do not experience adverse effects from received sound levels less than about 160 dB re 1µPa; though at higher levels, fish may exhibit avoidance, stress, temporary and permanent hearing loss, auditory and non-auditory tissue damage, egg damage, reduced growth rates, or mortality (Hastings and Popper, 2005).

A significant amount of work has been conducted to define the issues associated with noise and marine life (Halvorsen et al 2011) and to develop sampling methodologies (Polagye et al. 2012, Williamson et al. 2016). However, little data collection has been conducted for specific turbine models. The best surrogates identified and considered for this analysis are Ocean Renewable Power Company's (ORPC) TidGen® Power System, a cross-flow helical design deployed in Cobscook Bay, Maine; and Open Hydro's Open Centre Turbine tested at the European Marine Energy Center (EMEC) in Orkney Scotland.

The information in the literature suggests that the sound produced by a tidal turbine may be heard by fish. However, several factors indicate that fish are unlikely to be adversely effected by tidal turbine sound: (1) the area of behavioral effect allows for individual avoidance of the area and passage upstream and downstream of the project site; (2) the turbine source does not exceed the physiological thresholds of impact; (3) fish prefer slow moving water and are likely to pass quickly through the project area given its high velocity flow (measured between 0.7 and 3.0 m/s in the lower third of the water column); and (4) existing noise levels from shipping suggest that the entire canal exceeds fish behavioral thresholds for noise. The turbine noise will be masked by shipping noise when ships pass. Existing fish occurrence and activity must accommodate this existing and longstanding impact.

The underwater noise from several marine renewable energy devices has been measured using

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this specification and found to fall below regulatory action levels and guidance developed in the US for protecting marine mammals and fish from harm due to underwater noise. Evidence suggests that underwater noise emitted from operational marine renewable energy devices is unlikely to significantly alter behavior or cause physical harm to marine animals (Copping and Hemery 2020).

#### Blade Strike

Little is known about the potential for fish to be impacted by moving tidal turbine blades. Studies of existing installations by Wilson et al (2007) concluded that turbine rotors are the most intuitive sources of significant collision risks with marine vertebrates.

Risk of a strike and impacts from a strike is influenced by a variety of factors. Mortality is a function of the probability of strike and the force of the strike. The seriousness of strike is related to the animal's swimming ability (i.e., ability to avoid the blade), water velocity, number of blades, blade design (i.e., leading edge shape), blade length and thickness, blade spacing, blade movement (rotation) rate, and the part of the rotor that the animal strikes. Studies in the lab and in the field provide some background information that is useful for assessing potential effects at the BTTS.

Jacobson et al. conducted research to better understand the interactions between fish and hydrokinetic turbines for two general design types (vertical cross-flow and ducted axial flow) (Jacobson et al 2012). Rainbow trout and largemouth bass were passed through a flume fixed with a lucid spherical turbine, a Darrieus-type (cross flow) turbine, and the Welka Generator, an axial flow propeller turbine. Behavior was recorded with video camera. The research suggested that strike mortality was not predicted for the particular Darrieus and Welka test turbines for flow velocities of 2.5 m/s or less while mortality could begin for the lucid spherical turbine at 1.7 m/s. Fish were also observed actively avoiding the turbines. Survival rates were recorded at 99%.

A study in a large flume used a New Energy cross-flow turbine, with the same type of turbine rotor that could be tested at the BTTS, in a very confined installation (the turbine blocked 26% of the flow area) and forced juvenile Atlantic salmon (sample size N=175) and adult American shad (N=208) to swim through the turbine zone (Castro-Santos and Haro, 2013). The authors state that the "most striking result of this study is the apparent lack of any injury or mortality incurred as a result of passing through the turbine zone for either species."

Field studies conducted at ORPC's project site in Cobscook Bay, Maine are described in Zydlewski et al 2016, Shen et al. 2016, and Viehman 2015. Shen states that their research is first opportunity to collect and apply empirical data to estimate the probability of fish encountering an MHK device under natural conditions. These studies describe fish monitoring techniques using hydroacoustic monitoring technology and various methodologies. The results provide specific information on the temporal and spatial distribution of fish in the project area. In considering the potential for fish to encounter the blades, the research calculates probability of blade strike to be 0.058 with a conclusion that fish likely avoided the device with horizontal movement beginning 140 m away (Shen et al. 2016).

Tidal and river energy devices may pose a risk of collision to marine mammals, fish, and diving seabirds. To date, there have been no observations of a marine mammal or seabird colliding with a turbine, and the limited number of interactions of fish in close proximity to a turbine have not resulted in obvious harm to the fish (Copping and Hemery 2020).

MRECo will implement an environmental monitoring program to mitigate potential effects of from the increase in turbine testing activity in the proposed condition. Monitoring will allow operators to ensure that environmental effects are limited. Monitoring reports produced for each test period will allow the public to better understand the potential effects of tidal turbines on the environment.

## 3.3.2 Threatened and Endangered Species

#### Affected Environment

A number of surveys of the canal area were conducted by the MA NHESP in 1995. They included a floristic survey, lichen survey, herpetofauna and marsh bird survey, lepidoptera and other insect inventory, and piping plover survey. None of these surveys looked at the project

site because of its disturbed and managed nature. The NHESP concluded that there are no state-wide exemplary plant communities on USACE property on lands where the project is proposed.

Federally-listed species that have been identified in the canal are listed in Table E-5 and other protected marine mammals are included in Table E-6. In May of 2015, the canal was closed for about an hour when a right whale was spotted in the canal swimming east. The canal was opened once the animal exited the canal into Cape Cod Bay.

Table E-5. Federally-listed Endangered Species Occurring in/near the Cape Cod Canal

Species Common Name	Species Scientific Name	Status
North Atlantic Right Whale	Eubalaena glacialis	Endangered
Humpback Whale	Megaptera novaeangliae	Endangered
Fin Whale	Balaenoptera physalus	Endangered
Leatherback sea turtles	Dermochelys coriacea	Endangered
Kemp's ridley turtle	Lepidochelys kempi	Endangered
Loggerhead turtle	Caretta caretta	Threatened
Green sea turtles	Chelonia mydas	Threatened
Hawksbill sea turtle	Eretmochelys imbricata	Endangered
Atlantic sturgeon	Acipenser oxyrinchus	Threatened

Source: <a href="http://www.nmfs.noaa.gov/pr/species/esa/listed.htm">http://www.nmfs.noaa.gov/pr/species/esa/listed.htm</a>

Table E-6. Other Protected Marine Mammals Occurring in/near the Cape Cod Canal

Species Common Name	Species Scientific Name
Pygmy Sperm Whale	Kogia breviceps
Long-finned Pilot Whale	Globicephala melas
Harbor porpoise	Phocoena phocoena
Atlantic white-sided dolphin	Lagenorhynchus acutus
Bottlenose dolphin	Tursiops truncatus
Harbor seal	Phoca vitulina
Harp seal	Pagophilus groenlandicus
Hooded seal	Cystophora cristata

Source: http://www.nmfs.noaa.gov/pr/species/mammals/; Cape Cod Stranding Network

The USFWS indicated that Bird Island is an important nesting location for the Federallyendangered roseate tern (Sterna dougallii). Bird Island is located approximately 1 nautical mile west of the Cleveland Ledge Channel. Piping plovers (Charadrius melodus) are a federally listed threatened species that nests in open, sandy beaches close to the dunes and are recorded as nested on Sandwich, MA beaches. The red knot (Calidris canutus rufa) is listed as threatened and migrating birds may stop in nearby areas during migrations.

The State of Massachusetts lists the least tern as a species of special concern. It breeds along coastal and freshwater habitats of North America from Maine to Florida on dry, exposed unvegetated areas on sandbars, or beaches in areas between the drift line and upland.

#### **Environmental Effects**

The potential environmental effects on threatened and endangered species are similar to those described above for fish. Marine mammals, particularly cetaceans, are sensitive to underwater noise in the marine environment. All listed endangered and protected species could have a direct interaction with a turbine resulting in blade strike.

As part of USACE review of a permit authorizing the construction and operations of the BTTS, NMFS concurred with USACE assessment that threatened and endangered species were not likely to be adversely affected by the tidal turbine testing if the turbines met specific operational limitations as follows:

There will be one turbine in operation at a time. The turbine type that will be used initially is a horizontal axis open-bladed turbine with a 3-meter diameter swept area. This would equate to a frontal area of 7-square-meters and a tip speed of 15 rpm, which equates to 2.4 m/s. However, the structure is able to support alternative technologies, which may result in broader limits, and the developers may test alternative technologies. Therefore, they have requested that the permit allow testing of any turbine that is  $\leq$ 4 meters, has a frontal area ≤7 square meters and tip speeds ≤20 rpm, which equates to 3.1 m/s. These limitations are based upon the water velocities in the Cape Cod Canal routinely reaching 2.5 meters per second. The tidal turbines that will be tested are designed for high torque, low velocity generation.

The facility will only test turbines that meet these operational conditions.

The approvals also considered potential acoustic impacts during construction and required some construction procedural protections but none on turbine operations. Conditions will be unchanged for testing turbines as was presented and permitted previously.

MRECo will also implement an environmental monitoring program to mitigate potential effects of from the increase in turbine testing activity in the proposed condition. Monitoring will allow operators to ensure that environmental effects are limited. Operating in a "test" environment will also enhance control of the process and allow the managers to stop the test if effects are observed, a condition that is not feasible for a commercial installation. Monitoring reports produced for each test period will allow the public to better understand the potential effects of tidal turbines on the environment.

### 3.3.3 Recreation

#### <u>Affected Environment</u>

The Cape Cod Canal is a popular location for recreational fishing both from shore and from boats. Parking areas for recreational activity where fishermen are directed include the Buzzards Bay Recreational Area on the east side of the Railroad Bridge as shown in **Figure E-6**. Shore fishing is not allowed adjacent to the Railroad Bridge or on the west side of the bridge where the BTTS is currently located due to the location of the USACE Cape Cod Canal Field Office which is not open to public access. Recreational boats may fish in the Cape Cod Canal including in the area of the BTTS. However, given the close proximity of the BTTS to both the Railroad Bridge Pier and the riprap shorelines, the location is already hazardous to all vessels.

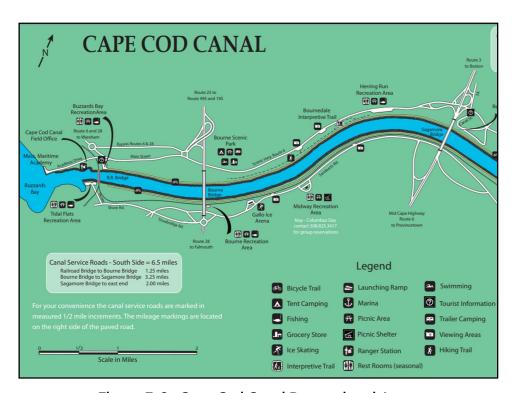


Figure E-6. Cape Cod Canal Recreational Areas

The USACE owns and manages land adjacent to the Cape Cod Canal which is open to a variety of recreational activities which are also shown on Figure E-9. Visitors are directed to a number of parking areas including the Buzzards Bay Recreation Area near the project site. The Buzzards Bay Recreation Area has picnicking facilities and rest rooms as well as access to a trail network along the north side of the canal.

#### **Environmental Effects**

The BTTS platform construction and operations has been evaluated for potential effects on recreation under permits approved by federal, state, and location authorities including the USACE and MA DEP under the Chapter 91 Waterways Program. Conditions associated with those approvals will be carried forward under a FERC license. The proposed construction of overhead electrical lines adjacent to the railroad tracks using existing or proposed utility poles is consistent with existing development and will not impact any transportation or recreational uses in the area.

#### 3.3.4 Cultural Resources

#### Affected Environment

The Massachusetts Historical Commission (MHC) Massachusetts Cultural Resources Information System (MACRIS) database was reviewed to identify any potential historical resources near the project. A summary of resources in proximity to the proposed project is provided below based on the information identified. The USACE PCN application was also sent to the SHPO, TPHO, and the MA BUAR and information is included below where comments were provided.

The Cape Cod Canal is included in the MACRIS as a historic resource. The canal complex includes the canal itself, originally built in 1914 and widened to its current design between 1931 and 1940, and other buildings and structures associated with the canal.

In the project area, this includes the Buzzards Bay Railroad Lift Bridge completed in 1935. The 210 ft tall towers rise from the canalward panel of the approach spans and consist of fourpanel X-braced open towers. The lift span consists of a 544 ft long, nine-panel Warren-type

truss with verticals with a curved top chord and a straight bottom chord. The towers support and contain the equipment for the vertical lift span. The top of each tower supports a drive house, a one-story, flat-roofed, sheet metal-enclosed structure containing the original 1935 General Electric Company lift span drive motors and cable sheave wheels, which raise and lower the 2,050-ton lift span and its two 1,000-ton counterweights. When raised, the bottom of the center span provides 135 ft of clearance above mean high water. The bridge features architectural decorations that include large conical openwork steel bar pinnacles mounted to the top of the drive houses, and shields bearing the USACE castle emblem flanked by ornate floral volutes on the approach span portals

A group of buildings currently owned by the USACE were originally constructed to support the maintenance of the canal. These buildings were erected between 1931 and 1940. They were used to maintain vessels that supported the widening of the canal during the 1930's. The buildings have been in continuing operations as support and storage facilities since that time.

The West Boat Basin is a rectangular excavation on the north side of the canal, immediately east of the Administration "Building. The West Boat Basin's banks are lined with stone rip-rap revetment. There are five docks in the basin. Four are wood docks on timber pilings with plank decks and railings. The two outer wood docks are for the Korean War-era former US Army tugboats Bourne and Manamet. The two inner wood docks are for the modem patrol boats Cataumet, Onset, and Wampanoag. A standard-gauge marine railway rises from the water at the east end of the Basin and extends east to the south end of the modem Maintenance Building. The Bourne (ca. 1952) and Manamet (ca. 1952) are both diesel-powered, steel-hulled tugboats. The Manamet is 102 ft long and has a 2,000 hp engine, and the Bourne is approximately the same length and has an 1,800 hp engine. Both are docked at the West Boat Basin.

Main Street Commercial Area through the village of Buzzards Bay is also identified for its historic character. The extant buildings were constructed in the 19<sup>th</sup> and 20<sup>th</sup> Centuries close to the two-lane road.

Communication with the MA BUAR stated that it has no record of known underwater archaeological resources in the project area (see DPLA, Appendix A).

#### **Environmental Effects**

The BTTS platform was erected in the fall of 2017 under authority of the USACE based on consultations with SHPO and THPO. The work included in the FERC License includes the continued operation of the BTTS through testing of scientific equipment and tidal turbines along with the installation of new electrical infrastructure to the platform to a point of interconnection at the end of Taylor Road. The new infrastructure will be similar to other infrastructure in the area which will not change the historic character.

#### **Developmental Analysis** 4.0

The following section summarizes the cost of the proposed Project and compares it to the estimated power benefits, the estimated cost of environmental benefits and the practicable alternatives. As expressly stipulated in FERC Guidance, the potential future cost of electricity is not considered.

## Power and Economic Benefits of the Project

The estimated cost of the proposed project is about \$700,000. The installation of the platform which has already been completed was \$400,000. The proposed improvements to interconnect the facility with the electric grid will be about \$300,000 including matching funds to the \$240,000 grant issued by the Seaport Economic Council.

The average annual power generation for the pilot project for planning purposes is projected to be 175 MWh. This assumes a peak turbine generation capacity factor of 50 kW.

Retail electricity rates recently negotiated by the Cape Light Compact (CLC) are presented in the DPLA, Exhibit A. The rates vary by customer rate class and lock-in term. Therefore, using a bundled price of \$0.11 / kWh as an example, the value of the electricity produced would be \$19,250 annually.

As a test facility, the primary purpose is not to generate electricity, but to support the development of grid-connected tidal turbine generators. The success of the grid-connected test facility will lead to future power benefits from the industry.

Typical year financial projections for the BTTS are provided in **Table E-7**. The amount of activity considers recent year allocations by the Department of Energy (DOE) Small Business Innovation and Research (SBIR) Program for tidal energy technologies.

Table E-7 **Typical Year Financial Projections** 

Calendar Quarter	Q1	Q <sub>2</sub>	Q <sub>3</sub>	Q4	Total
Revenue	\$ 22,000	\$ 52,000	\$ 52,000	\$ 32,000	\$ 158,000
Salaries	\$ 10,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 70,000
Contractor - Permitting	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 4,000
Contractor - Other	\$ 2,000	\$ 5,000	\$ 5,000	\$ 3,000	\$ 15,000
Other Direct	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 20,000
Indirect @20%	\$ 3,600	\$ 6,200	\$ 6,200	\$ 5,800	\$ 21,800
Total Cost	\$ 21,600	\$ 37,200	\$ 37,200	\$ 34,800	<u>\$ 130,800</u>
Excess Revenue	\$ 400	\$ 14,800	\$ 14,800	\$ (2,800)	\$ 27,200

#### **Comparison of Alternatives** 4.2

Under the no-build alternative, the BTTS would conduct marine sensor and instrumentation testing and potentially a non-grid-connected turbine test as developers receive funding from the DOE for such projects. Revenue would be significantly lower, and it will be more difficult to market the test center without the grid-tied facility.

If a FERC license is issued and the facility can connect to the grid, the typical year projections shown above represent a minimum estimate of economic development impact from the project. Furthermore, funding to develop the facility has been provided by government agencies expressly due to the potential for the facility to increase economic development activity.

#### **Cost of Environmental Measures** 4.3

Assuming that turbines are tested for six months of the year and the environmental monitoring program as proposed is implemented to assess impacts through data collection and reporting, the expected cost of monitoring the facility is approximately \$60,000. All other environmental measures have been incorporated into the project design.

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# 4.4 Air Quality

Air quality will not be impacted by the project.

#### Conclusions and Recommendations 5.0

### 5.1 Comparison of Alternatives

In this section, we compare the developmental and non-developmental effects of MRECo's proposal.

Annual generation to the grid under the no action alternative is o and the projected generation is 175 MWh.

Aquatic Resources: Under the applicant's proposal, tidal turbine testing activity will increase compared to the no action alternative, though testing is authorized under current permits in the no action alternative. Potential impacts on Essential Fish Habitat will increase. The implementation of an environmental monitoring program will minimize potential impacts.

Threatened and Endangered Species: Under the applicant's proposal, tidal turbine testing activity will increase compared to the no action alternative, though testing is authorized under current permits in the no action alternative. Potential impacts on Threatened and Endangered Species will increase. However, NMFS Section 7 concurrence that testing of any turbine is not likely to adversely affect federally-listed species is the turbine is  $\leq$ 4 meters, has a frontal area  $\leq$ 7 square meters and tip speeds  $\leq$ 20 rpm, which equates to 3.1 m/s. These specifications will be maintained.

Recreation: Potential effects on fishing and boating in and around the BTTS will be unchanged between the no action alternative and the applicant's proposed alternative. In each case, the BTTS occurs in public waters near the railroad bridge and use of the area is limited by proximity to the bridge and shoreline. Fishing from the shoreline is this area is restricted by the USACE for security purposes associated with operating the Cape Cod Canal and the Railroad Bridge.

Cultural Resources: Potential effects on cultural resources will be unchanged between the no action alternative and the applicant's proposed alternative. In each case, the BTTS already occurs in public waters associated with the Cape Cod Canal. No additional construction period impacts can occur to underwater archaeology. Land-based construction is limited to installation of seven utility poles in an existing developed railroad right-of-way.

Under the no-action alternative, environmental conditions would remain the same and no enhancement of environmental resources would occur.

Table E-8 **Comparison of Alternatives** 

Resource	No Action Alternative	Proposed Action Alternative
Generation	o MWh	175 MWh
Aquatic Resources	BTTS operates at lower levels	BTTS operates at higher levels.
Threatened and Endangered Species	BTTS operates at lower levels	BTTS operates at higher levels.
Recreation	BTTS occurs in canal	BTTS occurs in canal (no change)
Cultural Resources	BTTS has already been constructed in marine waters; no additional construction.	Installation of seven additional utility poles required.

## 5.2 Comprehensive Development and Recommended Alternative

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of fish and wildlife, the protection of recreational opportunities, and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

This section is reserved for Commission staff to provide the basis for, and a summary of, our recommendations for licensing the BTTS Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

### 5.3 Unavoidable Adverse Effects

This section summarizes "any adverse environmental effects that cannot be avoided should the proposal be implemented," as required by 40 CFR, section 1502.14, including effects of protection, mitigation, and enhancement measures.

It is concluded that there will be no unavoidable adverse effects. Potential project effects can be avoided through the implementation of the environmental monitoring program. This combined with the proposed operation regime, where turbine will be closely inspected during testing and can be readily removed from the water should adverse conditions be identified, will allow the applicant to avoid adverse effects.

### 5.4 Recommendations of Fish and Wildlife Agencies

Under the Section 10(j) of the Federal Power Act, FERC must make a determination regarding recommendations submitted by federal and state fish and wildlife agencies and whether or not they are consistent with the purpose and requirements of Part I of the FPA and applicable law. Whenever FERC believes that a fish and wildlife agency recommendation may be inconsistent with the purposes and requirements of the FPA or other applicable law, FERC and the agency shall attempt to resolve any such inconsistency, giving due weight to recommendations, expertise, and statutory responsibilities of such agency. The applicant acknowledges that the so-called Section 10(j) Recommendations will be determined at a point subsequent to this filing.

### 5.5. Consistency with Comprehensive Plans

Section 10(a)(2)(A) of the Federal Power Act (FPA), requires FERC to consider the extent to which a project is consistent with federal or state comprehensive plans for improving,

developing, or conserving a waterway or waterways affected by the Project. A list of comprehensive plans is available on the FERC website in a document titled "List of Comprehensive Plans, January 2018." In this report, FERC lists 31 comprehensive plans for the Commonwealth of Massachusetts. Of these 31 listed plans, 10 appear potentially relevant to the Project and surrounding area and are listed below. MRECo believes the responsible development of the Project installation is consistent with the goals outlined in any of these documents.

#### 5.5.1 Federal Plans

The following is a list of federal plans

Atlantic States Marine Fisheries Commission. 1992. Fishery management plan for inshore stocks of winter flounder. (Report No. 21). May 1992.

The Atlantic States Marine Fisheries Commission (ASMFC) approved a Fishery Management Plan (FMP) for inshore stocks of winter flounder (*Pleuronectes americanus*) in May 1992. States that agreed to participate in the plan included Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Delaware. The purpose of the plan was to address: 1) management of inshore stocks of winter flounder; and 2) to prominently consider habitat and environmental quality as factors affecting the condition of the resource. The Plan called for reductions in fishing mortality on winter flounder and allowed states the flexibility to achieve those reductions based on the life history characteristics of the individual stocks inhabiting each region. A suite of management measures designed to reduce fishing mortality on winter flounder have been implemented in state and federal waters and overall the implementation of the plan has been successful. The Plan was overhauled in 2005 as Amendment 1 to the Interstate Fishery Management Plan for Inshore Stocks of Winter Flounder, for which Addendum 1 was authorized in 2009.

The proposed BTTS Project must protect winter flounder EFH. As all in-water construction activities have already been completed under the USACE PCN and other regulatory approvals, the potential impacts are limited to operations of the BTTS. The PCN and other permits and approvals included operation of the BTTS and it is assumed that these permits will be

incorporated into the FERC license to preserve the associated requirements. Therefore, it is concluded that the BTTS Project is consistent with the winter flounder fishery management plan.

Atlantic States Marine Fisheries Commission. 1995. Interstate fishery management plan for Atlantic striped bass. (Report No. 24). March 1995.

In March of 1995, the ASMFC adopted Amendment 5 establishing a harvest level of striped bass that maintained a spawning stock biomass able to produce self-sustaining spawning stocks in each designated spawning area. Amendment 5 also established an extensive list of monitoring and reporting requirements that the states/jurisdictions in the Plan were required to complete. Since 1995 the Commission has adopted five addenda to respond to changing circumstances in the fishery. The plan establishes coastal commercial catch allocations for striped bass by state based on historic landings from the 1970's. The management program has achieved and maintained a restored striped bass biomass. Current management is being undertaken consistent with Amendment 6 enacted in 2003 and Addendum I (2007) and II (2010).

The proposed BTTS Project is located in waters utilized by striped bass as evidenced by the amount of recreational fishing that occurs in the canal. As all in-water construction activities have already been completed under the USACE PCN and other regulatory approvals, the potential impacts are limited to operations of the BTTS. The PCN and other permits and approvals included operation of the BTTS and it is assumed that these permits will be incorporated into the FERC license to preserve the associated requirements. Impacts of the project on striped bass are not anticipated due to the strong and fast swimming ability of striped bass and the relatively slow rate at which the turbine foils turn. Based on this evaluation, it is concluded that the project is consistent with the striped bass management plan.

Atlantic States Marine Fisheries Commission. 1998. Amendment 1 to the Interstate Fishery Management Plan for Atlantic sturgeon (Acipenser oxyrhynchus oxyrhynchus). (Report No. 31). July 1998.

The Atlantic Sturgeon Fishery Management Plan was approved in 1998 with the goal to restore Atlantic sturgeon spawning stocks to population levels that will provide for sustainable fisheries and ensure viable spawning populations. Some of the actions taken under the plan are (1) close the fishery for a sufficient time period to reestablish spawning stocks and increase numbers in current spawning stocks; (2) reduce or eliminate bycatch mortality; (3) determine the spawning sites and provide protection of spawning habitats for each spawning stock; (4) where feasible, reestablish access to historical spawning habitats for Atlantic sturgeon; and (5) conduct appropriate research as needed. It is important to note that Atlantic sturgeon is also listed as a candidate species for listing under the Federal Endangered Species Act.

Atlantic sturgeon may occur in the project area due to its presence in coastal waters of southern New England. However, because sturgeon spawn in estuaries, the project is not located in critical spawning habitat or in areas where sturgeon congregate. Furthermore, sturgeon tend to occupy the lower portion of the water column and therefore are less likely to be in direct conflict with the turbine units. Should sturgeon occupy the area where the foils operate, they are likely to sense the structures and move away from them. Based on this assessment, it is concluded that the project is consistent with the sturgeon management plan.

Atlantic States Marine Fisheries Commission. 1998. Interstate fishery management plan for Atlantic striped bass. (Report No. 34). January 1998.

See above, Atlantic States Marine Fisheries Commission. 1995. Interstate fishery management plan for Atlantic striped bass. (Report No. 24). March 1995. The 1998 report is an update to the original 1995 report and is now managed under Amendment 6 authorized in 2003.

Atlantic States Marine Fisheries Commission. 1999. Amendment 1 to the Interstate Fishery Management Plan for shad and river herring. (Report No. 35). April 1999.

Amendment 1 to the Interstate Fishery Management Plan for shad and river herring was authorized in 1999 to protect, enhance and restore shad and river herring species including American and hickory shad, blueback herring, and alewife. Management of the two groups was split with Amendment 2 for river herring and Amendment 3 for shad. Management measures include reducing bycatch in other fisheries and restoring spawning habitats.

management plan.

Herring are pelagic fish that spawn in freshwater rivers and spend adult years at sea before returning to spawn. There are a number of herring spawning runs near the project area including at the Herring Run Recreation Area east of the project at about the midpoint of the Canal. Herring likely transit the project area during their adult phase. The project area is not anticipated to be critical habitat for herring. Should herring pass through the project area, it is expected that they will move to avoid the turbines due to their strong swimming ability. Based

Atlantic States Marine Fisheries Commission. 2000. Technical Addendum 1 to Amendment 1 of the Interstate Fishery Management Plan for shad and river herring. February 9, 2000. See above, Atlantic States Marine Fisheries Commission. 1999. Amendment 1 to the Interstate Fishery Management Plan for shad and river herring. (Report No. 35). April 1999.

on this information, it is concluded that the BTTS is consistent with the shad and river herring

Atlantic States Marine Fisheries Commission. 2009. Amendment 2 to the Interstate Fishery Management Plan for shad and river herring, May 2009.

See above, Atlantic States Marine Fisheries Commission. 1999. Amendment 1 to the Interstate Fishery Management Plan for shad and river herring. (Report No. 35). April 1999.

Atlantic States Marine Fisheries Commission. 2010. Amendment 3 to the Interstate Fishery Management Plan for shad and river herring, February 2010.

See above, Atlantic States Marine Fisheries Commission. 1999. Amendment 1 to the Interstate Fishery Management Plan for shad and river herring. (Report No. 35). April 1999.

Atlantic States Marine Fisheries Commission. 2000. Interstate Fishery Management Plan for American eel (Anguilla rostrata). (Report No. 36). April 2000.

The American Eel Fishery Management Plan was enacted in 2000 to enhance the eel stock, protect and restore inland habitats, and collect information to better understand all life stages of the species. Eels pass through the project area between spawning areas in the Gulf Stream and adult stage in fresh and estuarine waters. The project is not located in an area critical to the American eel. Passage of eels through the project area should not be affected by the proposed project as there is sufficient area for eels to pass. Based on this evaluation, it is

concluded that the BTTS is consistent with the American Eel management plan.

Atlantic States Marine Fisheries Commission. 2008. Amendment 2 to the Interstate Fishery Management Plan for American eel. October 2008.

See above, Atlantic States Marine Fisheries Commission. 2000. Interstate Fishery Management Plan for American eel. (Report No. 36). April 2000.

Atlantic States Marine Fisheries Commission. 2013. Amendment 3 to the Interstate Fishery Management Plan for American eel. August 2013.

See above, Atlantic States Marine Fisheries Commission. 2000. Interstate Fishery Management Plan for American eel. (Report No. 36). April 2000.

Atlantic States Marine Fisheries Commission. 2014. Amendment 4 to the Interstate Fishery Management Plan for American eel. October 2014.

See above, Atlantic States Marine Fisheries Commission. 2000. Interstate Fishery Management Plan for American eel. (Report No. 36). April 2000.

Massachusetts Executive Office of Energy and Environmental Affairs. Statewide Comprehensive Outdoor Recreation Plan (SCORP): Massachusetts Outdoor 2006. Boston, Massachusetts.

Massachusetts Outdoor 2006 is a plan that reviews recreational activities and locations in Massachusetts and plans for future actions to enhance those activities. States prepare Statewide Comprehensive Outdoor Recreation Plans that are approved by the US Department of Interior and make the state eligible for Federal Land and Water Conservation Funds for the acquisition of open space and recreation lands.

The BTTS platform is located adjacent to the Cape Cod Canal. Transmission upgrades will be located adjacent to recreational areas. The area where the platform is located is adjacent to the USACE District office, an area of the shoreline that is not open to recreational activities. The transmission upgrades will be adjacent to the existing railroad track and not used for public access. Based on this information, it is determined that the project is consistent with the SCORP.

National Marine Fisheries Service. 1998. Final Amendment #11 to the Northeast Multi-species

Fishery Management Plan; Amendment #9 to the Atlantic sea scallop Fishery Management Plan; Amendment #1 to the monkfish Fishery Management Plan; Amendment #1 to the Atlantic salmon Fishery Management Plan; and Components of the proposed Atlantic herring Fishery Management Plan for Essential Fish Habitat. Volume 1. October 7, 1998.

The Northeast Multi-species Fishery Management Plan was developed to manage offshore bottom fish often caught as a group, particularly Atlantic cod, haddock, and yellowtail flounder. However, it also includes Redfish, Pollock, Whiting, Red Hake, White Hake, American Plaice, Witch Flounder, Winter Flounder, and Windowpane Flounder. The original plan was enacted in 1985 and has undergone revisions over time to respond to changes in stock levels. In 2004, Amendment 13 was enacted to address persistent overfishing. Amendment 16 was enacted in January of 2010.

The initial Sea scallop fishery management plan was enacted in 1982. Subsequent changes to the plan have been approved as Amendments including Amendment 9 in 1998. Most recently, the New England Fishery Management Council is in the process of finalizing Amendment 15 to incorporate the latest management measures. The Sea scallop fishery includes all of US territorial waters. Stock management is focused on offshore area on Georges Bank, the Great South Channel and the edge of the continental shelf.

The Monkfish fishery is co-managed by the New England Fishery Management Council and the Mid-Atlantic Fishery Management Council. They manage the fishery as two stocks with New England managing the portion in the Gulf of Maine and Georges Banks and the Mid-Atlantic managing from Georges Bank south. The initial management plan was adopted in 1999. Management is currently proceeding on the direction of Amendment 5.

Atlantic salmon is not a commercially-viable species and therefore does not have an active management program. The basis for conservation and management is included in the Fishery Management Plan prepared in 1987. Atlantic salmon, like other anadromous species, spawn in freshwater rivers and spend adult years at sea. Native Atlantic salmon in Maine rivers (Androscoggin and north) are listed for protection under the endangered species act. Runs in the Connecticut and Merrimack Rivers are reintroduced from the Maine populations and as a

result are not protected.

Atlantic sea herring is presently managed under Amendment 4 of the Fishery Management Plan enacted in April 2010. Amendment 4 and previous amendments were enacted subsequent to Amendment 1 referenced above based on new stock information and management considerations.

The BTTS must demonstrate that the project will not impact Essential Fish Habitat (EFH) for commercially managed species and lifestages that have been identified as occurring in the project area. The construction and operation of the BTTS was authorized by the USACE PCN which included an EFH Assessment. A description of EFH in the project area is described above and potential impacts of the project on EFH. It has been determined that the project will not impact EFH for any of the managed species and lifestages. Therefore, it has been concluded that the BTTS Project is consistent with the various fishery management plans identified above.

U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986.

The North American Waterfowl Management Plan was initially prepared in 1986 and has undergone subsequent updates. A 2010/2011 draft version is currently available for public comment. The plan is implemented across the Canada, Mexico, and the US with the purpose of conserving waterfowl populations and their habitats. A number of the species of listed for management occurs in the project area. Examples include eiders, scaups, ducks, and scoters.

The BTTS Project must consider the potential impact of the project on avian resources including waterfowl discussed in the management plan. The construction and operation of the BTTS was authorized by the USACE PCN which included an assessment of impacts on wildlife. Impacts are not anticipated due to the ducks' ability to perceive the structures and the limited extent of the project concentrated in relatively rough waters. Based on this information, it is concluded that the project is consistent with the North American Waterfowl Management Plan.

#### 5.5.2 State Plans

The Massachusetts Ocean Plan was promulgated on December 31, 2009 and was most recently updated in 2015. It serves as the Commonwealth's blueprint for the protection and sustainable use of state ocean waters, protects critical marine habitat and important waterdependent uses and sets standards for new ocean-based projects. The ocean plan's management framework is implemented within the existing regulatory structure, with the relevant agencies coordinating review and approval of proposed ocean projects.

The Ocean Plan concluded that commercial tidal energy facilities were unlikely to be constructed in Massachusetts Coastal Waters in the first five years before the plan is updated and therefore did not identify areas for their allowance. However, the plan did recognize pilot projects of 5 MW or less that might obtain a FERC License and prescriptively allowed such projects to be sited in multi-use areas in state waters. It specifically lists wave and tidal energy facilities as being allowed uses. Therefore, the proposed project is consistent with state plans.

# **Finding of No Significant Impact**

This section is reserved for the Commission to issue a finding on potential environmental effects of the BTTS project.

#### **Literature Cited** 7.0

Bigelow, H.B. and Schroeder, W.C. 1953. Fishes of the Gulf of Maine. Fishery Bulletin of the Fish and Wildlife Service Vol. 53. 577 pp.

Buehler, D., R. Oestman, J. Reyff, K. Pommerenck, and B. Mitchell. 2015. Technical Guidance for the Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. CalTrans. CTHWANP-RT-15-306.01.01.

Castro-Santos, T. and A. Haro. 2013. Survival and behavioral effects of exposure to a hydrokinetic turbine on juvenile Atlantic salmon and adult American shad. Estuaries and Coasts. doi:10.1007/s12237-013-9680-6

Copping, A and L. Hemery. 2020. OES-Environmental 2020 State of the Science Report: Environmental Effects of Marine Renewable Energy Development Around the World.

Copping, A., Sather, N., Hanna, L., Whiting, J., Zydlewski, G., Staines, G., Gill, A., Hutchison, I., O'Hagan, A., Simas, T., Bald, J., Sparling C., Wood, J., and Masden, E. 2016. Annex IV 2016 State of the Science Report: Environmental Effects of Marine Renewable Energy Development Around the World.

Federal Energy Regulatory Commission. 2008. Preparing Environmental Documents: Guidelines for Applicants, Contractors, and Staff. Office of Energy Projects. Division of Hydropower Licensing. September 2008.

Federal Energy Regulatory Commission. 2008. Licensing Hydrokinetic Pilot Projects. FERC Hydrokinetic White Paper. April 14, 2008.

Federal Energy Regulatory Commission and Department of the Army. 1981. Memorandum of Understanding Regarding Non-Federal Hydropower Development.

Halvorsen, M., T. Carlson, and A. Copping. 2011. Effects of Tidal Turbine Noise on Fish Hearing and Tissues. Environmental Effects of Marine and Hydrokinetic Energy. Pacific Northwest National Laboratory. US Department of Energy.

Hastings, M.C. & Popper, A.N. (2005). Effects of Sound on Fish. (Subconsultants) Submitted by Jones & Stokes to California Dept. of Transportation Contract No. 43A0139. Task Order 1.

Kiefer and Trefry. 2017. Pers. Comm. Cited from Greater Atlantic Fisheries Office Section 7 Program.

https://www.greateratlantic.fisheries.noaa.gov/protected/section7/listing/garfo\_master\_esa\_s pecies\_table\_-\_atlantic\_sturgeon\_o51917.pdf

Lovell, J.M., M.M. Findlay, R.M. Moate, J.R. Nedwell, and M.A. Pegg. 2005. The inner ear morphology and hearing abilities of the Paddlefish (*Polyodon spathula*) and the Lake Sturgeon (Acipenser fulvescens). Comparative Biochemistry and Physiology, Part A 142:286-296.

MA Executive Office of Energy and Environmental Affairs. 2015. Massachusetts Ocean Plan.

McKenna, M, D. Ross, S. Wiggins, and John Hildebrand. 2012. Underwater radiated noise from modern commercial shipping. The Journal of the Acoustical Society of America. 131, 92. 2012.

Ocean Renewable Power Company (ORPC). 2011. Fisheries and Marine Life Monitoring Plan. FERC Pilot License Application. Cobscook Bay Tidal Energy Project. FERC No. 12711. May 2011.

Shen, H., G. Zydlewski, H. Viehman, and G. Staines. 2016. Estimating the probability of fish encounter with a marine hydrokinetic device. Renewable Energy 97 (2016). 746-756. June 11, 2016.

Subacoustech, Ltd. 2008. Measurement and assessment of underwater noise from the Crest Energy /OpenHydro tidal turbine at the EMEC facility, Orkney. February 29, 2008.

Tomichek, C., J. Colby, M. Adonizio, M. Frisk, K. Dunton, D. Fox, and A. Jordaan. 2014. Tagged Species Detection: Approach to Monitoring Marine Species at Marine Hydrokinetic Projects.

Proceedings of the 2<sup>nd</sup> Marine Energy Technology Symposium. April 15-18, 2014. Seattle, Washington.

UMASS. 2017. Drop Camera Survey in the Area of the Proposed Bourne Tidal Test Facility. School of Marine Science and Technology (SMAST).

US Department of the Navy. 2013. Atlantic Fleet Training and Testing Final Environmental Impact Statement / Overseas Environmental Impact Statement. http://aftteis.com/aftt2/Documents/August-2013-Final-Phase-II

Verdant Power. 2019. Roosevelt Island Tidal Energy Project. FERC No. 12611. Article 401 Proposed RITE Monitoring of Environmental Effects (RMEE) Plan Amendments. March 2019.

Viehman, H. 2015. Hydroacoustic analysis of the effects of a tidal power turbine on fishes. A final dissertation submitted in partial fulfillment of the requirements for a Degree of Doctor of Philosophy.

Ward, J., I. Schultz, D. Woodruff, G. Roesijadi, and A. Copping. 2010. Assessing the Effects of Marine and Hydrokinetic Energy Development on Marine and Estuarine Resources. Pacific Northwest National Laboratory. US Department of Energy.

Waring GT, Josephson E, Maze-Foley K, Rosel, PE, editors. 2013. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2012. NOAA Tech Memo NMFS NE 223; 419 p.

WaterCube. 2017. Survey of Water Currents Adjacent to the Bourne Railroad Bridge.

Wynne, K. and M. Schwartz. 1999. Guide to Marine Mammals and Turtles of the U.S. Atlantic and Gulf of Mexico. Rhode Island Seagrant.

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# Exhibit G – Boundary Map

# **Bourne Tidal Test Site**

The proposed FERC Project Area for the Bourne Tidal Test Site (BTTS) includes portions of federal land owned and managed by the US Army Corps of Engineers (USACE) associated the Cape Cod Canal. It incorporates all project elements from the existing test platform installed on the seabed of the canal to proposed utility poles and overhead lines to interconnect the facility to the regional electric grid. The proposed project area is consistent with existing permits and licenses including the USACE Section 408 Real Estate lease and the MassDEP 30year Chapter 91 license.

This section presents boundary maps for the BTTS. Section 5.18(f) of the Commission's regulations requires that all maps and drawings conform to Section 4.39. As required by section 4.41(h), Exhibit G must consist of a single map showing the complete project boundary, including the locations of the project generating units and the transmission line. The following is a description of the information on the boundary map.

### **Evolution of the Boundary Map**

MRECo received a Preliminary Permit from FERC to investigate the energy resource potential and prepare a Draft Pilot License Application for a generation project to interconnect with the electric grid. The area of the Preliminary Permit includes waters in the western segment of the Cape Cod Canal as shown in blue in the area map in the upper left-hand corner of the Boundary Map.

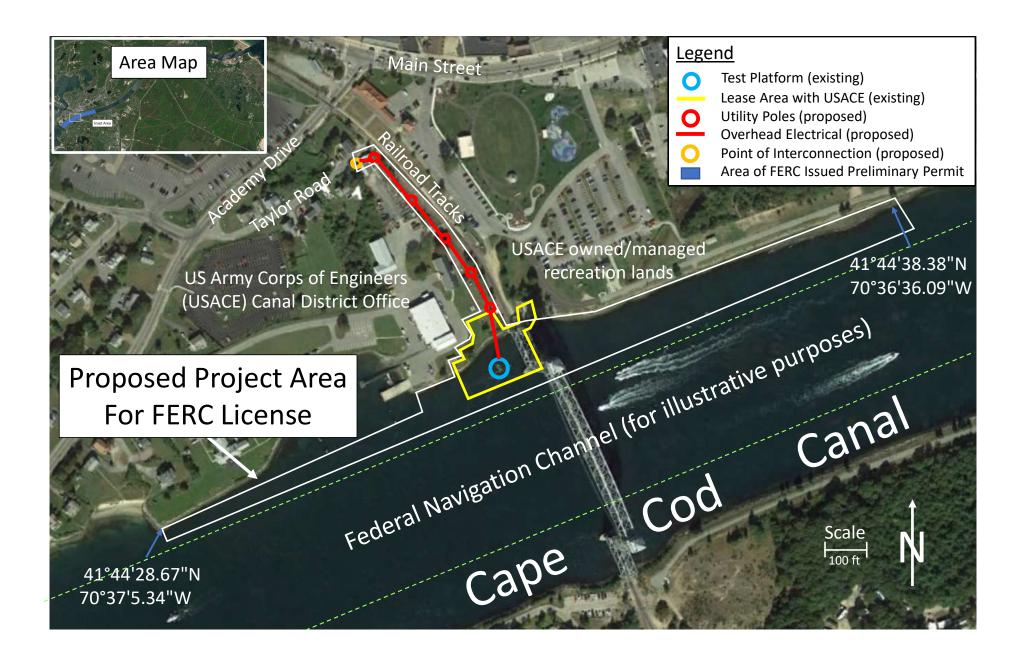
In 2017, MRECo and the US Army Corps of Engineers executed a lease agreement under USACE's Section 408 process. The lease provided MRECo with rights to use federal property including the seabed of the Cape Cod Canal for structures and uses necessary to build and operate the BTTS. The lease has been extended several time and portions of the rights and uses have been modified in the extensions. For example, the original lease provided that MRECo could attach a power cable to the underside of the Railroad Bridge to connect to a ground enclosure and battery pack. However, these elements are no longer needed and have been removed. The current lease area covers portions of the project area critical to operating the BTTS. It is shown by the yellow polygon on the Boundary Map.

The existing BTTS Platform, installed in December 2017, is highlighted on the Boundary Map with a blue circle. Stamped engineering plans of the platform prepared for the Massachusetts Department of Environmental Protection (DEP) Chapter 91 License and recorded with the Barnstable County Registry of Deeds are provided in Exhibit F.

The proposed project area includes lands owned and managed by the USACE and the Massachusetts Department of Transportation (MassDOT) for the purposes of constructing and operating electrical facilities to interconnect the existing platform to the regional electric grid. The Boundary Map shows in red the proposed utility poles and associated overhead electrical line, a design of which is provided in Exhibit F. The point of interconnection (POI) will be at the first existing utility pole at the end of Taylor Road shown on the Boundary Map as an orange circle.

The remaining areas of the proposed project are limited to the waters and seabed to the east and west of the existing platform as illustrated on the Boundary Map. The boundary extends to the east to coordinates 41°44'38.38"N and 70°36'36.09"W at the mean high water mark level with the canal's northeast landward boundary and to the west to coordinates 41°44'28.67"N and 70°37'5.34"W at the corresponding mean high water mark level with the canal's northwest landward boundary. At each corner, the boundary extends toward the center of the canal perpendicular to the shore approximately 100 feet forming a seaward boundary that is parallel and adjacent to the canal centerline face of the existing bridge pier nearest the existing BTTS platform. In any case, no part of the proposed project area will extend into the Federal Navigation Channel. Once input on this proposed project area is vetted through the review process, the exact corners of the boundary will be surveyed by a professional land surveyor. The primary purpose of including the waters of the Cape Cod Canal to the east and west of the existing platform and landward of the Federal Navigation Channel is to preserve the integrity of the existing water resource for which the primary purpose of the project requires.

Boundary Map



Document Content(s)
MainApplication Exhibits No-F.pdf

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