



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI  
GOVERNOR

DAVID P. LITTELL  
COMMISSIONER

VIA ELECTRONIC MAIL

July 23, 2009

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First street, N.E.  
Washington, DC 20426

RE: Comments on Pre-Application Document and Study Requests  
Half Moon Cove Tidal Power Project  
FERC No. 12704-002

Dear Normand:

The DEP has reviewed the March 27, 2009 Notice of Intent (NOI) of Tidewalker Associates to file an application for an original license for the proposed Half Moon Cove Tidal Power Project, FERC No. 12704. The project would be located in Cobscook Bay in the City of Eastport and the Town of Perry, Washington County, Maine.

A preliminary permit for the Half Moon Cove Tidal Power Project was issued by FERC on April 10, 2007. The purpose of the permit is to maintain priority of application for a license during the term of the permit while Tidewalker Associates conducts investigations and secures data necessary to determine the feasibility of the proposed project and, if found feasible, prepares an acceptable application for license. This permit is scheduled to expire on March 31, 2010.

The DEP understands that Tidewalker Associates will be using the default integrated licensing process (ILP) for the licensing of the project.

The DEP has also reviewed the Pre-Application Document for the Half Moon Cove Tidal Power Project, as filed with FERC by Tidewater Associates. The purpose of the PAD is to provide participants in this licensing proceeding with a summary of the available information necessary to identify project issues and related information needs, to develop study requests and study plans to identify project-related issues, and to prepare documents analyzing the license application, which is expected to be filed with FERC in April 2013.

By letter dated May 26, 2009, the DEP acknowledged receipt of the NOI and PAD and notified Tidewalker Associates that a completed Request for Initial Stage Consultation for the proposed licensing of the Half Moon Cove Tidal Power Project was required, along with the requisite processing fee. The required form and fee were subsequently received by the DEP on July 10, 2009.

Finally, the DEP has also reviewed FERC's May 26, 2009 National Environmental Policy Act (NEPA) Scoping Document for the Half Moon Cove Tidal Power Project and attended a FERC-led scoping meeting on the project on June 24, 2009 in Eastport, Maine.

In accordance with the ILP schedule, the deadline for comments on the PAD and Scoping Document is July 23, 2009.

Based on our review, the DEP has the following initial consultation comments on the Pre-Application Document and study requests.

### Project Description

The proposed project would consist of: (1) a new 1,200-foot-long rock-filled dam (tidal barrage), including two emptying-filling gates, with a maximum height of 72 feet and a crest elevation of 27 feet msl, located across the inlet of Half Moon Cove in Cobscook Bay; (2) an impoundment (Half Moon Cove) that will vary in size from 880 acres at high tide to 250 acres at low tide; (3) an integral concrete powerhouse containing two bulb turbines, at least one of which will be reversible, each connected to an 8 MW generator for a total installed capacity of 16 MW; (4) a 7.1-mile-long 34.5 kV transmission line; and (5) appurtenant facilities.

Construction of the proposed tidal dam would involve the placement of approximately 140,000 cubic yards of core and filter material, rockfill, armor stone, compacted gravel, and concrete. Construction of the proposed powerhouse would involve the placement of approximately 100,000 cubic yards of concrete. The footprint of the proposed dam and powerhouse has not been quantified.

### Project Operation

There are two possible modes of project operation, both of which would generate electricity by developing a hydraulic head (i.e., a difference in water elevation) between Half Moon Cove and the remainder of Cobscook Bay. This head would vary as a function of the tidal cycle. Currently, Half Moon Cove has an average tidal range of 18 feet, varying from 12 feet (neap tide) to 26 feet (spring tide), and an intertidal area of approximately 600 acres.

#### 1. One-Way (High Pool) Operation

In a one-way (high pool) mode of operation, water would be held high in Half Moon Cove until sufficient hydraulic head is created by the out-going tide to generate power. Generation would continue until the necessary hydraulic head is lost. Generation would then cease, the filling gates in the dam would be opened, and Half Moon Cove would be re-filled with the in-coming tide. The cycle of generation would then be repeated.

A one-way mode of operation for the proposed Half Moon Cove Tidal Power Project would result in the generation of an average of approximately 54 million kilowatt-hours of electricity a year.

A one-way mode of operation would reduce the average tidal range in Half Moon Cove from 18 feet to about 7 feet, which would result in approximately 350 acres of existing natural intertidal area being converted to either permanently submerged land (because the cove won't empty completely) or permanent upland area (because the cove won't refill completely).

2. Two-way (High Pool-Low Pool) Operation

In a two-way (high pool-low pool) mode of operation, water would be held high in Half Moon Cove until sufficient hydraulic head is created by the out-going tide to generate power. Generation would continue until the necessary hydraulic head is lost. Generation would then cease, the emptying gates would be opened, and Half Moon Cove would continue to drain out until low tide. The gates in the dam would then be closed, and water would be held low in Half Moon Cove until sufficient hydraulic head is created by the in-coming tide to generate power (this would require installation of either two sets of one-way turbines or one set of reversible turbines). Generation would continue until the necessary hydraulic head is lost. Generation would then cease, the filling gates would be opened, and Half Moon Cove would continue to refill until high tide. The cycle of generation would then be repeated.

A two-way mode of operation for the proposed Half Moon Cove Tidal Power Project with at least one reversible turbine would result in the generation of an average of approximately 60-70 million kilowatt-hours of electricity a year.

A two-way mode of operation would reduce the average tidal range in Half Moon Cove from 18 feet to about 15-16 feet, which would result in approximately 140 acres of existing natural intertidal area being converted to permanently submerged land (because the cove won't empty completely).

Jurisdiction

The construction and operation of the proposed tidal power project is subject to approval by the DEP under the Maine Waterway Development and Conservation Act (MWDCA). The federal licensing and permitting of the proposed tidal power project is also subject to the Water Quality Certification provisions of Section 401 of the Clean Water Act.

MWDCA Approval Criteria

Pursuant to Title 38 MRSA Section 636, a MWDCA permit shall be approved when the applicant has demonstrated that the following criteria have been met:

1. The applicant has the financial capability and technical ability to undertake the project.
2. The applicant has made adequate provisions for protection of public safety.
3. The project will result in significant economic benefits to the public, including, but not limited to, creation of employment opportunities for workers of the State.
4. The applicant has made adequate provisions for traffic movement of all types out of or into the development area.

5. Within the jurisdiction of the Maine Land Use Regulation Commission, the project is consistent with zoning adopted by the Commission.
6. The applicant has made reasonable provisions to realize the environmental benefits of the project, if any, and to mitigate its adverse environmental impacts.
7. The advantages of the project are greater than the direct and cumulative adverse impacts over the life of the project based upon the following considerations:
  - A. Whether the project will result in significant benefit or harm to soil stability, coastal and inland wetlands or the natural environment of any surface waters and their shorelines;
  - B. Whether the project will result in significant benefit or harm to fish and wildlife resources. In making its determination, the DEP shall consider other existing uses of the watershed and fisheries management plans adopted by the Department of Inland Fisheries and Wildlife, the Department of Marine Resources and the Atlantic Sea Run Salmon Commission;
  - C. Whether the project will result in significant benefit or harm to historic and archaeological resources;
  - D. Whether the project will result in significant benefit or harm to the public rights of access to and use of the surface waters of the State for navigation, fishing, fowling, recreation and other lawful public uses;
  - E. Whether the project will result in significant flood control benefits or flood hazards; and
  - F. Whether the project will result in significant hydroelectric energy benefits, including the increase in generating capacity and annual energy output resulting from the project and the amount of nonrenewable fuels it would replace.
8. There is a reasonable assurance that the project will not violate applicable state water quality standards, including the provisions of the State's antidegradation policy, as required for water quality certification under Section 401 of the United States Water Pollution Control Act (a.k.a., Clean Water Act).

#### Applicable Water Quality Standards

Water Quality Standards and the water quality classifications of all surface waters of the State have been established by the Maine Legislature (Title 38 MRSA Sections 464-469).

The following classifications apply to the waters affected by the proposed Half Moon Cove Tidal Power Project:

- All waters in Cobscook Bay, including Half Moon Cove, except those tidal waters in Pembroke west of a line from Leighton Neck in Pembroke to Youngs Point in Lubec-Class SB.

Class SB waters shall be of such quality that they are suitable for the designated uses of recreation in and on the water; fishing; aquaculture; propagation and harvesting of shellfish; industrial process and cooling water supply; hydroelectric power generation; navigation; and as habitat for fish and other estuarine and marine life. The habitat of Class SB waters shall be characterized as unimpaired. The dissolved oxygen content of Class SB waters must be not less than 85% of saturation. Between May 15<sup>th</sup> and September 30<sup>th</sup>, the numbers of enterococcus bacteria of human and domestic animal origin in these waters shall not exceed a geometric mean of 8 per 100 milliliters or an instantaneous level of 54 per 100 milliliters. Discharges to Class SB waters shall not cause adverse impact to estuarine and marine life in that the receiving waters shall be of sufficient quality to support all estuarine and marine life indigenous to the receiving water without detrimental changes in the resident biological community. There shall be no new discharge to Class SB waters which would cause closure of open shellfish areas by the Maine Department of Marine Resources.

#### Antidegradation

The Department may only approve water quality certification if the standards of classification of the waterbody and the requirements of the State's antidegradation policy will be met. The State's antidegradation policy provides that existing in-stream uses and the level of water quality necessary to protect those existing uses must be maintained and protected, and that existing in-stream uses are those uses which have actually occurred on or after November 28, 1975, in or on a water body whether or not the uses are included in the standards for classification of the particular water body.

#### Criteria for Study Plan Requests

Pursuant to FERC's regulations on the integrated licensing process at 18 C.F.R. § 5.9, comments on the PAD must be accompanied by any information gathering and study requests, and any information or study request must satisfy the following criteria:

- (1) Describe the goals and objectives of each study proposal and the information to be obtained;
- (2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;
- (3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;
- (4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

- (5) Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements;
- (6) Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge; and
- (7) Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

These criteria are intended to provide clear and consistent guidelines for study requests and to ensure that the scope of any studies is related to project operations and effects and thus stays within FERC's purview in the relicensing process.

#### Requested Studies—Biological and Chemical Water Quality

As outlined above, under Maine's water quality standards, Class SB waters shall be suitable for the designated use of habitat for fish and other estuarine and marine life and such habitat shall be characterized as unimpaired. In addition, the dissolved oxygen content of Class SB waters shall be not less than 85% of saturation.

A baseline assessment is needed of existing biological and chemical water quality conditions in Half Moon Cove. Therefore, the DEP requests that Tidewalker Associates collect sufficient data to (1) characterize the habitat of Half Moon Cove for fish and other estuarine and marine life under existing conditions, including quantitative sampling of the benthic community in the subtidal zone and in the lower, middle, and upper intertidal zones, and (2) determine whether the waters of Half Moon Cove currently meet Class SB dissolved oxygen standards.

The construction and operation of the proposed project would reduce the existing tidal range in Half Moon Cove and, as a consequence, may adversely impact biological and chemical water quality in the cove and may violate Maine's water quality standards. Therefore, the DEP requests that Tidewalker Associates undertake modeling to determine the impacts of the proposed construction and operation of the Half Moon Cove Tidal Power Project on (1) existing habitat conditions in the cove for fish and other estuarine and marine life, including the benthic community in the cove, and (2) existing chemical water quality, including dissolved oxygen content, turbidity, salinity levels, and temperature. This modeling should be undertaken for both one-way and two-way modes of operation and should analyze the impact on habitat conditions resulting from changes in the duration of intertidal zone wet and dry periods due to project operation.

Finally, the construction of the proposed project will eliminate an unknown amount of existing subtidal zone and intertidal zone habitat in the area covered by the dam and powerhouse. Therefore, the DEP requests that Tidewalker Associates (1) quantify the amount of subtidal and intertidal zone habitats that would be eliminated by the footprint of the proposed project works, (2) collect sufficient data to characterize the existing uses

and value of these habitats, and (3) provide an analysis of the direct and cumulative impacts of the loss of these habitats on fish and other marine and estuarine life.

#### Requested Studies—Designated and Existing Uses

As outlined above, under Maine's water quality standards, Class SB waters shall be suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, navigation, and as unimpaired habitat for fish and other estuarine and marine life. As also outlined above, under Maine's antidegradation policy, existing in-stream uses must be maintained and protected.

A baseline assessment is needed of existing in-stream uses in Half Moon Cove. Therefore, the DEP requests that Tidewater Associates collect sufficient data to identify and quantify existing in-stream uses of Half Moon Cove, including existing uses of the cove for commercial and recreational boating and fishing, including scallop dragging and harvesting of clams, marine worms, periwinkles and other marine animals and plants.

The construction and operation of the proposed project would eliminate between 140 and 350 acres of intertidal zone habitat in Half Moon Cove, would eliminate navigation into and out of the cove, would restrict the movement of fish and other marine organisms onto and out of the cove, and may cause injury or death to marine organisms moving into or out of the cove, including both swimming and drifting organisms. These impacts may result in Half Moon Cove no longer being suitable for the designated uses of recreation in and on the water, fishing, navigation, and as unimpaired habitat for fish and other estuarine and marine life, in violation of Maine's water quality standards. These impacts may also result in the existing in-stream uses of Half Moon Cove for recreational and commercial boating and fishing and as habitat for various marine organisms being significantly impaired, in violation of Maine's antidegradation policy. Therefore, the DEP requests that Tidewater Associates analyze the impact of the construction and operation of the proposed Half Moon Cove Tidal Power Project on designated uses and existing in-stream uses of the cove, including the cumulative impact on the passage of marine organisms into and out of the cove. This analysis should be undertaken for both one-way and two-way modes of operation.

As stated in our August 10, 2006 comments on the application for preliminary permit for the project, construction of a dam across the inlet to Half Moon Cove would interfere with the natural ecosystem and traditional uses of the cove. Because of this, DEP has significant unanswered questions and concerns regarding the environmental acceptability of the project.

As the applicant, Tidewater Associates will have the burden of demonstrating that construction and operation of the proposed project will not violate applicable water quality standards and that the approval criteria of the MWDCA are met.

#### Requested Studies—Wildlife Resources

The construction and operation of the proposed project may, by altering the tidal regime in Half Moon Cove, adversely affect existing tidal marshes and submerged aquatic vegetation in the cove and the existing use of the cove by wildlife. Therefore, the DEP requests that Tidewater Associates (1) collect sufficient data to characterize the location, quantity and quality of any existing tidal marshes and submerged aquatic vegetation beds,

including eel grass beds, in Half Moon Cove, and (2) analyze the impact of the construction and operation of the proposed Half Moon Cove Tidal Power Project on any existing tidal marshes and submerged aquatic vegetation beds and on the use of the cove by wildlife. This analysis should be undertaken for both one-way and two-way modes of operation.

#### Other Issues

1. Breaching of Causeway and Installing Gates. In the PAD and at the June 24, 2009 scoping meeting, Tidewalker Associates indicated that the plans for the Half Moon Cove Tidal Power Project include the possibility of breaching the existing causeway between the Pleasant Point Passamaquoddy Indian Reservation and Carlow Island in Eastport and installing emptying/filling gates. The installation of such gates would assist in the control of water levels in Half Moon Cove and would re-establish some degree of tidal exchange between Half Moon Cove and Passamaquoddy Bay.

The DEP understands that, in 2003, the US Army Corps of Engineers prepared a Preliminary Restoration Plan (PRP) for a potential project to restore estuarine habitat in Half Moon Cove. The next step in project planning would be a feasibility investigation, the major focus of which would be to consider alternative solutions to restore the ecological connection between Passamaquoddy Bay and Half Moon Cove, thus restoring the habitat quality of the cove. The DEP also understands that, in 2008, the Pleasant Point Passamaquoddy Tribal Council notified the Corps that the Council had adopted a resolution directing the Corps to proceed with the feasibility study. The DEP is not aware that any work on this feasibility study has begun. Even if one or more alternatives were found to be feasible, funding would still have to be obtained before the project could proceed. In its 2003 PRP, the Corps estimated total costs for various project alternatives as ranging from \$1.144 million (for construction of 2 culverts through the causeway) to \$5.117 million (for construction of a 100-foot-long bridge to replace part of the causeway and dredging of the cove).

If Tidewater Associates is proposing to breach the existing causeway and install and operate emptying/filling gates as part of its plans for the Half Moon Cove Tidal Power Project, then the DEP requests that Tidewater Associates analyze the environmental impacts of this action, both during project construction and operation. Tidewater Associates is also advised to discuss this proposal directly with the Maine Department of Transportation, which owns the causeway and associated highway.

If Tidewater Associates is not proposing to breach the existing causeway but is instead proposing to investigate the possibility of installing emptying/filling gates if the causeway is breached by others, then this action should be deleted from the proposed Half Moon Cove Tidal Power Project as (1) the project should only consist of actions proposed by Tidewalker Associates, not by others, and (2) any breaching of the causeway is purely hypothetical at this time.

2. Construction of Roadway Across the Dam. In the PAD and at the June 24, 2009 scoping meeting, Tidewalker Associates indicated that construction of the proposed rock-filled dam would allow the placement of a secondary road and/or a rail line into Eastport across the dam. The placement of a road across the dam would provide a second access road into Eastport and would reduce traffic through the Pleasant Point Passamaquoddy Indian Reservation. An optional design being considered for dam



construction (pile-driven piers supporting a barrier wall and powerhouse) would not allow placement of a road or rail line.

If Tidewater Associates is proposing to place a road and/or rail line across the dam as part of its plans for the Half Moon Cove Tidal Power Project, then the DEP requests that Tidewater Associates analyze the impact of this action on traffic movement into and out of Eastport, Perry, and the Pleasant Point Passamaquoddy Indian Reservation. Tidewater Associates is also advised to discuss this proposal directly with the Maine Department of Transportation.

3. Project Economics and Financial Capability. To meet the financial capability standard of the MWDCA, Tidewater Associates must submit with its permit application a statement of the estimated total cost of the project, as proposed, and a statement that details plans for the financing of the project.

In the event that an applicant is unable to demonstrate financial capability at the time of filing an application, the MWDCA provides that a conditional permit may be granted requiring a demonstration of financial capability prior to the start of project construction.

At the June 24, 2009 scoping meeting, Tidewater Associates stated that the estimated construction cost for the project is \$70-\$80 million, in 2008 dollars, for a single pool project. We note that Tidewater Associates would have to buy or lease all the lands required for the construction and operation of the proposed project, thus increasing project costs. We also note that, as stated by Tidewater Associates at the June 24, 2009 scoping meeting, reversible turbines (which are needed for two-way project operation) are significantly more expensive than one-way turbines, thus further increasing project costs beyond the \$70-\$80 million estimate provided by Tidewater Associates. Finally, we note that breaching the causeway and installing emptying/filling gates and/or constructing a roadway across the dam, if proposed by Tidewater Associates as part of the project, will increase project costs still further.

As the applicant, Tidewater Associates will have the burden of demonstrating that it has a viable plan for financing project construction and operation.

### Study Plan

Under FERC's integrated licensing process, Tidewater Associates is required to file a proposed study plan for the Half Moon Cove Tidal Power Project by September 6, 2009 (45 days after the close of the comment period on the PAD and Scoping Document). The DEP will review and provide comments on this plan.

Letter to Kimberly D. Bose  
Comments RE: FERC No. 12704-002  
July 23, 2009  
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Thank you for this opportunity to comment on this project. Please feel free to contact me by telephone at 207-287-7784 or by email at [dana.p.murch@maine.gov](mailto:dana.p.murch@maine.gov) if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Dana Paul Murch". The signature is written in a cursive, flowing style.

Dana Paul Murch  
Dams & Hydropower Supervisor

cc: Normand Laberge, Tidewalker Associates  
Leslie Bowman, Tidewalker Associates  
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Janice Scanlon, Perry Town Clerk  
Sean Mahoney, Conservation Law Foundation  
Clinton Townsend, Maine Rivers  
DEP File # L-24656-3A-A-N