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October 2, 2009

Mr. Fred Ayer, Executive Director
Low Impact Hydropower Institute
34 Providence St.
Portland, ME 04103

RE: Draft Application Reviewer Report for the
Deer Island Hydroelectric Facility

Dear Fred:

Attached please find my draft reviewer's report on the application by the Massachusetts Water Resources Authority for certification of the Deer Island Hydroelectric Facility by the Low Impact Hydropower Institute (LIHI). Please contact me with any questions or concerns.

Sincerely,

s// Ron

Ronald A. Kreisman

Attachment

**Review of Low Impact Hydropower Institute Application
for Low Impact Hydropower Certification:
Deer Island Hydroelectric Facility**

Introduction and Overview

This report reviews the application submitted by the Massachusetts Water Resources Authority (applicant) to the Low Impact Hydropower Institute (LIHI) for Low Impact Hydropower Certification for the Deer Island Hydroelectric Facility(facility). The Federal Energy Regulatory Commission (FERC) licensed the facility with a Exemption (Conduit) (FERC #11412) in 1993, permitting the construction, operation and maintenance of two 1,000 kw generators located at the bottom of two waster treatment conduit chutes. Due to significant construction delays, the two generators actually were started and placed on-line in July 2001. The energy generated by the facility is used exclusively to provide electrical power to the co-located wastewater treatment facility.

Project and site characteristics. The facility is located in the vicinity of the pumping station at the Deer Island Wastewater Treatment Facility on Deer Island, in Boston Harbor, Boston Massachusetts. As a conduit project, hydropower is generated as follows. Treated wastewater from the treatment plant is discharged into an effluent channel, with the flow then split between two separate concrete conduits going to two corresponding hydro turbines. The two intake openings are each approximately 20 feet by 18 feet, and decrease to 11 feet by 11 feet immediately upstream of the turbines, which are two Kaplan units (2,000 kw installed capacity). The powerhouse is approximately 100' by 100'. Maximum unit flow that the turbines can accommodate is approximately equivalent to maximum flow through the secondary treatment plant. Thus, the "mode of operation" of this facility is to harness the energy contained in the treated wastewater effluent as it drops from the treatment plant's disinfection basin through the conduits and through the turbines. After the turbines, the effluent conduit joins the outfall chute which discharges into an outfall shaft, which then drops the effluent into a 9.5 mile outfall tunnel and then into Massachusetts Bay.

Public comment and agency letters. LIHI received no public comments. LIHI received one agency letter, from the Commonwealth of Massachusetts Department of Fish and Game, Division of Fisheries and Wildlife, stating that:

The Department supports the LIHI application of the Deer Island Hydropower Project. The turbines are located in a conduit and utilize waste water, as such this project will have no effects on the fish and wildlife resources of the Commonwealth.

General conclusions and recommendation. I could find no environmental, recreational or cultural issues whatsoever that are caused by the existence of these two turbines in the conduit, or issues to which these turbines contribute. While I understand that there are ongoing water quality issues concerning Boston Harbor and the impact to the Harbor of discharges from the treatment plant, these discharge issues have nothing to do with the hydro generation facility but are wholly related to operations of a large sewage treatment plant discharging into a harbor.

All commenters offered the same view, and believe certification of facility to be a “no brainer.” Review of the entire FERC docket since exemption granted in 1993 does not reveal a single environmental comment or issue logged in the entire docket. Safety inspections by FERC appear to be on a regular basis, but the results are not publicly available.

Recommendation. Based on my review of information submitted by the applicant, my review of additional documentation, and my consultations with resource agency staff, I believe the Deer Island Hydroelectric Facility MEETS all of the criteria to be certified and I RECOMMEND certification.

Low Impact Certification Criteria

A. *Flows*

- 1) **Is the Facility in Compliance with Resource Agency Recommendations issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations) for both the reach below the tailrace and all bypassed reaches?**

NOT APPLICABLE.

If YES, go to B.

If NOT APPLICABLE, go to A2.

If NO, project fails.

- 2) **If there is no flow condition recommended by any Resource Agency for the Facility, or if the recommendation was issued prior to January 1, 1987, is the Facility in Compliance with a flow release schedule, both below the tailrace and in all bypassed reaches, that at a minimum meets Aquatic Base Flow standards or “good” habitat flow standards calculated using the Montana-Tennant method?**

NOT APPLICABLE AS A CONDUIT FACILITY FOR A SEWAGE TREATMENT PLANT, AS DESCRIBED ABOVE.

If YES, go to B

If NO, go to A3.

- 3) *If the Facility is unable to meet the flow standards in A.2., has the Applicant demonstrated, and obtained a letter from the relevant Resource Agency confirming that demonstration, that the flow conditions at the Facility are appropriately protective of fish, wildlife, and water quality?*

If YES, go to B
If NO, project fails.

PASS

B. Water Quality

1) Is the Facility either:

- a) In Compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the Facility after December 31, 1986? Or**
- b) In Compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?**

YES, IN THAT TREATMENT PLANT IS IN COMPLIANCE AND HYDROPOWER FACILITY IS NOT AFFECTING THIS COMPLIANCE.

If YES, go to B2.
If NO, project fails.

- 2) Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?**

NO.

If YES, go to B3.
If NO, go to C.

- 3) If the answer to question B.2 is yes, has there been a determination that the Facility is not a cause of that violation?**

YES.

If YES, go to C.
If NO, project fails.

PASS

C. Fish Passage and Protection

- 1) **Is the Facility in Compliance with *Mandatory Fish Passage Prescriptions* for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?**

NOT APPLICABLE

If YES, go to C5.

If NOT APPLICABLE, go to C2.

If NO, project fails.

- 2) **Are there historic records of anadromous and/or catadromous fish movement through the Facility area, but anadromous and/or catadromous fish do not presently move through the Facility area (e.g., because passage is blocked at a downstream dam or the fish run is extinct)?**

YES

If YES, go to C2a.

If NO, go to C3.

- a) **If the fish are extinct or extirpated from the Facility area or downstream reach, has the Applicant demonstrated that the extinction or extirpation was not due in whole or part to the Facility?**

NOT APPLICABLE; HYDROPOWER TURBINES ARE UNRELATED TO ANY FISHERIES IMPACT.

If YES, go to C2b.

If NOT APPLICABLE, go to C2b.

If NO, project fails.

- b) **If a Resource Agency Recommended adoption of upstream and/or downstream fish passage measures at a specific future date, or when a triggering event occurs (such as completion of passage through a downstream obstruction or the completion of a specified process), has the Facility owner/operator made a legally enforceable commitment to provide such passage?**

NOT APPLICABLE.

If YES, go to C5.

If NOT APPLICABLE, go to C3.

If NO, project fails.

3) If, since December 31, 1986:

- a) **Resource Agencies have had the opportunity to issue, and considered issuing, a Mandatory Fish Passage Prescription for upstream and/or downstream passage of anadromous or catadromous fish (including delayed installation as described in C2a above), and**
- b) **The Resource Agencies declined to issue a Mandatory Fish Passage Prescription,**
- c) **Was a reason for the Resource Agencies' declining to issue a Mandatory Fish Passage Prescription one of the following: (1) the technological infeasibility of passage, (2) the absence of habitat upstream of the Facility due at least in part to inundation by the Facility impoundment, or (3) the anadromous or catadromous fish are no longer present in the Facility area and/or downstream reach due in whole or part to the presence of the Facility?**

NOT APPLICABLE, AS NO FISHERY RESOURCES IN THE VICINITY OF PROJECT. WHEN PROJECT WAS LICENSED BY FERC IN 2003, ALL FISHERY AGENCIES REALIZED THIS AND DECLINED TO COMMENT ON OR ISSUE ANY FISHERIES OR PASSAGE-RELATED REQUIREMENTS.

If NO, go to C5.

If NOT APPLICABLE, go to C4.

If YES, project fails.

4) If C3 was not applicable:

- a) **Are upstream and downstream fish passage survival rates for anadromous and catadromous fish at the dam each documented at greater than 95% over 80% of the run using a generally accepted monitoring methodology? Or**
- b) **If the Facility is unable to meet the fish passage standards in 4.a., has the Applicant demonstrated, and obtained a letter from the US Fish and Wildlife Service or National Marine Fisheries Service confirming that demonstration, that the upstream and downstream fish passage measures (if any) at the Facility are appropriately protective of the fishery resource?**

If YES, go to C5.

If NO, project fails.

5) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of *Riverine* fish?

If YES, go to C6.

If NOT APPLICABLE, go to C6.

If NO, project fails.

6) Is the Facility in Compliance with Resource Agency Recommendations for Riverine,

anadromous and catadromous fish entrainment protection, such as tailrace barriers?

NOT APPLICABLE

If YES or NOT APPLICABLE, go to D
If NO, project fails.

PASS

D. Watershed Protection

- 1) Is there a buffer zone dedicated for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation) extending 200 feet from the high water mark in an average water year around 50 - 100% of the impoundment, and for all of the undeveloped shoreline**

NOT APPLICABLE

If YES = Pass, go to E and receive 3 extra years of certification
If NO = go to D2

- 2) Has the facility owner/operator established an approved watershed enhancement fund that: 1) could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1., and 2) has the agreement of appropriate stakeholders and state and federal resource agencies?**

NOT APPLICABLE

If YES = Pass, go to E and receive 3 extra years of certification
If NO = go to D3

- 3) Has the facility owner/operator established through a settlement agreement with appropriate stakeholders and that has state and federal resource agencies agreement an appropriate shoreland buffer or equivalent watershed land protection plan for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low impact recreation)**

NOT APPLICABLE

If YES = Pass, go to E
If NO = go to D4

- 4) Is the facility in compliance with both state and federal resource agencies recommendations in a license approved shoreland management plan regarding protection, mitigation or enhancement of shorelands surrounding the project.

NOT APPLICABLE

If YES = Pass, go to E

If No = Fail

PASS

E. Threatened and Endangered Species Protection

- 1) Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?

NO

If YES, go to E2.

If NO, go to F.

- 2) If a recovery plan has been adopted for the threatened or endangered species pursuant to Section 4(f) of the Endangered Species Act or similar state provision, is the Facility in Compliance with all recommendations in the plan relevant to the Facility?

If YES or NOT APPLICABLE, go to E3.

If NO, project fails.

- 3) If the Facility has received authority to incidentally *Take* a listed species through: (i) Having a relevant agency complete consultation pursuant to ESA Section 7 resulting in a biological opinion, a habitat recovery plan, and/or (if needed) an incidental Take statement; (ii) Obtaining an incidental Take permit pursuant to ESA Section 10; or (iii) For species listed by a state and not by the federal government, obtaining authority pursuant to similar state procedures; is the Facility in Compliance with conditions pursuant to that authority?

If YES, go to E4.

If NOT APPLICABLE, go to E5.

If NO, project fails.

- 4) If a biological opinion applicable to the Facility for the threatened or endangered species has been issued, can the Applicant demonstrate that:

- a) The biological opinion was accompanied by a FERC license or exemption or a habitat conservation plan? Or
- b) The biological opinion was issued pursuant to or consistent with a recovery plan for the endangered or threatened species? Or
- c) There is no recovery plan for the threatened or endangered species under active development by the relevant Resource Agency? Or
- d) The recovery plan under active development will have no material effect on the Facility's operations?

If YES, go to F

If NO, project fails.

- 5) If E.2. and E.3. are not applicable, has the Applicant demonstrated that the Facility and Facility operations do not negatively affect listed species?

If YES, go to F.

If NO, project fails.

PASS

F. Cultural Resource Protection

- 1) If FERC-regulated, is the Facility in Compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?

YES

If YES, go to G.

If NOT APPLICABLE, go to F.2

- 2) If not FERC-regulated, does the Facility owner/operator have in place (and is in Compliance with) a plan for the protection, mitigation or enhancement of impacts to Cultural Resources approved by the relevant state or federal agency or *Native American Tribe*, or a letter from a senior officer of the relevant agency or Tribe that no plan is needed because Cultural Resources are not negatively affected by the Facility?

If YES, go to G.

If NO, project fails.

PASS

G. Recreation

- 1) **If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?**

YES

If YES, go to G3.

If NOT APPLICABLE, go to G2.

If NO, project fails.

- 2) **If not FERC-regulated, does the Facility provide recreational access, accommodation (including recreational flow releases) and facilities, as Recommended by Resource Agencies or other agencies responsible for recreation?**

If YES, go to G3.

If NO, project fails.

- 3) **Does the Facility allow access to the reservoir and downstream reaches without fees or charges?**

NOT APPLICABLE

If YES, go to H.

If NO, project fails.

PASS

H. Facilities Recommended for Removal

- 1) **Is there a Resource Agency Recommendation for removal of the dam associated with the Facility?**

NO

If NO, facility is low impact.

If YES, the project fails.

PASS

FACILITY IS LOW IMPACT

RECORD OF CONTACTS

Date of Conversation: 10/02/09
Application Reviewer: Ronald Kreisman, Consultant

Person Contacted: Roger Janson, US EPA, Region 1
Telephone/email: janson.roger@epa.gov
Areas of Expertise: Wastewater discharge licensing and compliance

SEE EMAIL EXCHANGE, BELOW

Ron,

I am not aware that there are or have been any water quality or other impacts (e.g. fisheries) caused either directly or indirectly by the operation of the MWRA's Deer Island hydropower facility. In fact, We at EPA strongly urge all utilities (water and wastewater) to look for opportunities incorporate energy alternatives into their facility operations.

I am at 617.918.1621.

Thanks
Roger

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"Ronald
Kreisman"
<kreisman@gwi.ne          To
t>          Roger Janson/R1/USEPA/US@EPA
                cc
09/30/2009 04:40
PM                Subject
                Quick questions re: Deer Island
                wastewater treatment plant and
                hydro turbines located there
Please respond
to
<kreisman@gwi.ne
t
```

Dear Mr. Janson:

The MWRA provided me your name as the EPA contact who would be familiar with its Deer Island wastewater treatment plant. I am an environmental attorney/consultant in Maine working with an organization called the Low Impact Hydropower Institute (LIHI), a non-profit 501(c)(3) that provides "green certification" to hydropower projects that LIHI determines to be operated in an environmentally responsible way. (More information about LIHI can be found at the organization's website: <http://lowimpacthydro.org>). MWRA has formally requested that LIHI certify its hydropower facility on Deer Island, meaning the two turbines located in the wastewater conduit pipes.

I have been reviewing the record of the facility at FERC (both when it was first licensed in 1993 and since it first began generating power in 2001), and have found a complete absence of any negative comments, or even comments of concern from either federal and state regulatory agencies dealing with water quality and fisheries. In fact, since the facility was licensed by FERC in 1993, at least at FERC there has not been a single comment at all on FERC's docket from any agency. Thus, while I understand that there are

ongoing water quality issues concerning Boston Harbor and the impact to the Harbor of discharges from the treatment plant, and have spent a bit of time on the MWRA web site quickly reviewing the NPDES permit and discharge monitoring reports, etc., I have not been made aware of any turbine-related or turbine-caused waste discharge or fishery issues, meaning discharge problems that are caused uniquely by the hydro generation or to which the hydro generation contributes (as opposed to issues that have nothing to do with the hydro, but are related to operations of a large sewage treatment plant discharging into a harbor). Am I missing something that EPA is aware of and monitoring? I am obviously asking these particular questions since LIHI's sole focus is on the potential involvement of the hydro project in adverse impacts to the environment.

Also, if you have suggestions of other people with whom I should be conferring on this matter, I would be most appreciative, as LIHI is trying to be thorough and comprehensive in its evaluation. I will be sending a similar email to Paul Hogan at Mass DEP. I am seeking a contact at NOAA in Gloucester, but do not have one, so if you have a suggestion here that would be most appreciated.

Thank you in advance for your input. If it would be easier or more comfortable to talk by phone, my contact information is below.

Sincerely,
Ron Kreisman
25 Page Street
Hallowell, ME 04347
207-626-0248 (ph)
207-626-0202 (fax)
kreisman@gwi.net (email)

Date of Conversation:	10/02/09
Application Reviewer:	Ronald Kreisman, Consultant
Person Contacted:	Robert Kubit, P.E.
Telephone/email:	robert.kubit@state.ma.us
Areas of Expertise:	Wastewater discharge licensing and compliance

Mr. Kubit echoed exactly the comments of Mr. Janson at USEPA. He said that the turbines because of their size, speed and location significantly upstream of the outfall could be having no environmental effect or impact. He recommended certification.

Date of Conversation: 10/01/09
Application Reviewer: Ronald Kreisman, Consultant
Person Contacted: Caleb Slater, MA Department of Fish and Game, Division of Fisheries and Wildlife
Telephone/email: caleb.slater@state.ma.us
Areas of Expertise: Hydropower and fisheries impacts.

Letter filed with LIHI by Mr. Slater. Followup telephone conversation confirmed that Division saw this as an excellent candidate for certification. Excerpt from comment letter on file with LIHI states:

Comments

The Department supports the LIHI application of the Deer Island Hydropower Project. The turbines are located in a conduit and utilize waste water, as such this project will have no effects on the fish and wildlife resources of the Commonwealth.

Sincerely,



Date of Conversation: October 1, 2009
Application Reviewer: Ronald Kreisman, Consultant
Person Contacted: John Warner, US FWS, Concord NH
Telephone/email: John_Warner@fws.gov
Areas of Expertise: Hydropower and fisheries impacts

SEE EMAIL EXCHANGE, BELOW.

Ron - I have no concerns about the hydro impacts of this Conduit Exemption project -
JW

John P. Warner, Energy/Hydropower Coordinator
New England Field Office, U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301
(603) 223-2541 - ext.15
(603) 223-0104 - FAX

www.fws.gov.northeast/newenglandfieldoffice

"Ronald Kreisman" <kreisman@gwi.net>

"Ronald Kreisman"
<kreisman@gwi.net>

09/30/2009 06:01 PM

Please respond to
<kreisman@gwi.net>

To: <john_warner@fws.gov>

cc

Subject: Quick Low Impact Hydro certification
question

Dear John:

I am an environmental attorney/consultant in Maine helping Fred Ayer review applications for certification by the Low Impact Hydropower Institute (LIHI). I don't believe we have met, although I have heard your name frequently from all my FWS friends in Maine and in Newton.

For full disclosure (!), this is the first of two emails you will get from me in the next day, as I am reviewing two projects requesting certification from LIHI in which you are listed by the owner in their LIHI application as a FWS contact person. The first of these projects is the Deer Island hydroelectric facility located at the wastewater treatment plant in Boston Harbor, where the Mass. Water Resources Authority operates two turbines at the end of two sewage treatment conduit pipes, before the outfall. The second is the recently-licensed Ice House project on the Nashua River in Ayer. This first email concerns the Deer Island hydro facility. Thanks in advance for helping out. Melissa Grader is also listed as a contact for the Ice House project, so on that one I will be contacting her as well.

I think this will be quick.

First, from the records I have available to me, I am not even sure if you or FWS have even been involved in this project, or involved recently, so if you haven't, I apologize and just let me know.

I have been reviewing the record of the hydro facility at FERC (both when it was first licensed in 1993 and since it first began generating power in 2001), and have found a complete absence of any negative comments, or even comments of concern from either federal and state regulatory agencies dealing with water quality and fisheries. In fact, since the facility was licensed by FERC in 1993, and since the turbines began operating in 2001, at least at FERC there has not been a single comment at all on FERC's docket from any agency. Thus, while I understand that there are ongoing water quality issues concerning Boston Harbor and the impact to the Harbor of discharges from the treatment plant, I have not been made aware of any *turbine-related or turbine-caused* habitat or fishery issues, meaning discharge problems that are caused uniquely by the

hydro generation or to which the hydro generation contributes (as opposed to issues that have nothing to do with the hydro, but are related to operations of a large sewage treatment plant discharging into a harbor). Am I missing something that you/FWS are aware of and monitoring? I am obviously focusing in on this aspect since LIHI's sole focus is on the potential involvement of the hydro project in adverse impacts to the environment.

Also, if you have suggestions of other people with whom I should be conferring on this matter, I would be most appreciative, as LIHI is trying to be thorough and comprehensive in its evaluation. Particularly I am seeking a contact at NOAA in Gloucester, but do not have one, so if you have a suggestion here that would be most appreciated.

Thank you in advance for your input. If it would be easier or more comfortable to talk by phone, my contact information is below.

Sincerely,
Ron Kreisman
25 Page Street
Hallowell, ME 04347
207-626-0248 (ph)
207-626-0202 (fax)
kreisman@gwi.net (email)
