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# Legal Considerations Relating to the Development of Hydroelectric Facilities within Rhode Island

Scott R. Gunst Jr.

*Sea Grant Law Fellow, Roger Williams University School of Law*

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**LEGAL CONSIDERATIONS RELATING TO THE DEVELOPMENT OF  
HYDROELECTRIC FACILITIES WITHIN RHODE ISLAND**

**Scott R. Gunst, Jr.**



*Marine Affairs Institute*



THE  
UNIVERSITY  
OF RHODE ISLAND

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## **I. INTRODUCTION**

In 2004 the Rhode Island State Legislature recognized that it is in the interest of the people of Rhode Island to develop and promote the use of renewable energy within the state. The Legislature found that a renewable energy program would contribute to protecting the public health and environment as well as decrease Rhode Island's dependence on fossil fuel generated power and stabilize future energy costs.<sup>1</sup> The Renewable Energy Standard (RES) passed by the Rhode Island Legislature is designed to promote the development of new renewable energy resources within Rhode Island. Under the RES, eligible renewable energy resources include small hydro facilities with a power generation not exceeding thirty (30) megawatts.<sup>2</sup> There are approximately 671 dams located throughout Rhode Island and the possible conversion to hydroelectric<sup>3</sup> generation facilities could help Rhode Island meet the renewable energy goals established in the RES.<sup>4</sup>

The RES was implemented in 2007 and requires that three (3) percent of electricity sold at retail to Rhode Island users must be obtained from an eligible renewable energy source.<sup>5</sup> This percentage increases each year so that by 2019, sixteen (16) percent of all retail power sold to Rhode Island consumers will be generated from eligible renewable resources.<sup>6</sup> The retrofitting of existing dams to hydroelectric generating facilities could contribute to meeting the RES goals. This report summarizes the legal issues surrounding the conversion of existing dams into hydroelectric facilities. In order to modify and develop hydroelectric dams, a developer will

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<sup>1</sup> R.I. Gen. Laws § 39-26-1 (2011).

<sup>2</sup> *Id.* § 39-26-2(21).

<sup>3</sup> Note: The term hydroelectric and hydropower will be used interchangeably throughout this report.

<sup>4</sup> Dep't of Env'tl. Mgmt., Dam Safety Program 6 (2010) *available at* <http://www.dem.ri.gov/programs/benviron/compinsp/pdf/damrpt10.pdf> [hereinafter *2010 Dam Safety Report*].

<sup>5</sup> R.I. Gen. Laws § 39-26-5(a) (2011). Note: Power generated using direct solar radiation, wind, "movement or the latent heat of the ocean," the heat of the earth, small hydro facilities, biomass facilities using eligible biomass fuels, and fuel cells using renewable resources, are "eligible renewable energy resources" under the Renewable Energy Standard.

<sup>6</sup> *Id.* § 39-26-4 (2011).

have to determine what, if any, federal, state or local permits are needed to develop a hydroelectric project.

## **II. FEDERAL REGULATIONS**

### **A. Federal Energy Regulatory Commission:**

#### **1. FERC Jurisdiction:**

Most hydroelectric projects will require permits from the Federal Energy Regulatory Commission (FERC) if the project: 1) is located on the navigable waters of the United States; 2) occupies lands of the United States; 3) uses surplus water or waterpower from a federal government owned dam; or 4) is located on a stream where Congress has Commerce Clause jurisdiction, the dam was constructed or modified on or after August 26, 1935, and impacts the interests of interstate or foreign commerce.<sup>7</sup> FERC has the exclusive authority under the Federal Power Act (FPA) to license most hydroelectric projects located on the navigable waters of the United States, on federal lands or, are connected to the interstate electrical grid.<sup>8</sup> Original licenses issued by FERC can be issued for up to fifty (50) years, and include licensing the construction, operating, and maintenance activities associated with that individual hydroelectric project.<sup>9</sup> When a license expires FERC has three options: 1) the federal government can take over the hydroelectric project; 2) FERC can reissue a new licensee for a period of thirty (30) to fifty (50) years; or 3) the hydroelectric facility can be decommissioned.<sup>10</sup>

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<sup>7</sup> Fed. Energy Regulatory Comm'n, Handbook for Hydroelectric Project Licensing 2-1 (2004) available at: [http://www.ferc.gov/industries/hydropower/gen-info/handbooks/licensing\\_handbook.pdf](http://www.ferc.gov/industries/hydropower/gen-info/handbooks/licensing_handbook.pdf) [hereinafter *Handbook for Hydroelectric*].

<sup>8</sup> *Id.* at 1-1.

<sup>9</sup> *Id.*

<sup>10</sup> *Id.*

## 2. FERC Licensing Process:

When determining whether to issue a license, the FPA as well as the National Environmental Policy Act (NEPA) requires that FERC take the proposed project's possible environmental impacts into consideration by "giving equal consideration to developmental and environmental values."<sup>11</sup> Environmental impact considerations include evaluating the project's possible impact on fish and other wildlife resources, visual aesthetics, cultural resources, and recreational resources.<sup>12</sup> When a license is issued there must be provisions included in the license which "adequately and equitably protect, mitigate damage to, and enhance fish and wildlife, based on recommendations of state and federal fish and wildlife agencies."<sup>13</sup>

When a hydroelectric developer begins a project, the developer must notify FERC of his intentions by filing a Notice of Intent to File a License (NOI), which includes the type of project and where it is located.<sup>14</sup> Accompanying the NOI is a Pre-Application Document which discloses all existing information relevant to the project including any environmental information. FERC will then use this information to identify issues, and create an environmental analysis.<sup>15</sup> There are three different licensing processes which a hydroelectric developer can choose to have FERC follow when evaluating whether to issue their license.<sup>16</sup> Regardless of process the developer chooses, during the licensing process FERC may require a number of studies to be performed on various issues including evaluating the project's environmental impact. Environmental studies should also look at possible alternative project configurations to

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<sup>11</sup> *Handbook for Hydroelectric*, *supra* note 6, at 1-2.

<sup>12</sup> *Id.*

<sup>13</sup> *Id.* at 1-4.

<sup>14</sup> *Id.* at 2-3.

<sup>15</sup> *Id.* at 2-4.

<sup>16</sup> *Id.* at 1-2. Note: A developer applying for a FERC license may choose to use either the; 1) integrated; 2) traditional; or 3) alternative licensing process. Since 2005, a developer who wishes to use either the traditional or alternative licensing process will require the approval of FERC. .

maximize a project's benefits and minimize any negative environmental effects that the project would have on the area.<sup>17</sup>

During the licensing process FERC will publish a Ready for Environmental Assessment notice (REA) requesting comments and recommendations once all the studies have been completed. All comments, including mandatory conditions, must be filed no later than sixty (60) days after the issuance of an REA; all responses and comments by the applicant must be filed within forty-five (45) days of the comment period's closing.<sup>18</sup> FERC will evaluate the comments and responses received and determine whether an environmental assessment (EA) is adequate and issue the EA for comment or determine an environmental impact statement (EIS) should be prepared.<sup>19</sup>

Once all the information with regards to the license is received, FERC issues or denies the license based on the information contained in the record. Accompanying the issued license is a licensing order that states all the terms and conditions that the developer must comply with including: the environmental conditions; engineering conditions; and administrative compliance conditions.<sup>20</sup> Licenses become final thirty (30) days after the license order is issued, "unless requests for rehearing and subsequent appeals are filed."<sup>21</sup> If a request for rehearing and judicial review is filed, a license will still go into effect when issued, unless FERC orders otherwise.<sup>22</sup>

### **3. FERC Monitoring:**

Once a license is issued, FERC continues to monitor the activities of the project through the Division of Hydropower Administration and Compliance (DHAC), located within FERC.

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<sup>17</sup> *Id.*

<sup>18</sup> 18 C.F.R. § 4.34(b) (2011).

<sup>19</sup> *Handbook for Hydroelectric*, *supra* note 6, at 3-13.

<sup>20</sup> *Id.* at 2-22.

<sup>21</sup> *Id.*

<sup>22</sup> *Id.*

DHAC reviews a hydropower facility's compliance with the conditions specified in the individual licenses issued, as well as FERC rules and regulations.<sup>23</sup> DHAC also reviews complaints made by stakeholders and investigates alleged license noncompliance allegations. DHAC is also authorized to make any amendments to licenses and exemptions including environmental protection measures and proposed project changes, as well as authorize any modifications to a project structure.<sup>24</sup>

Dam Safety Surveillance and Monitoring Plan Outlines (DSSMP) are created for each FERC license issued to help dam owners monitor and evaluate the performance of a dam or project structure. Included in the DSSMP is information regarding that dam's threshold values, procedures for reading instruments, surveillance plans as well as the visual inspection procedures for that individual dam.<sup>25</sup> DSSMPs also require that dam owner and operators submit Dam Safety Surveillance and Monitoring Reports (DSSMR) to FERC. The DSSMRs are an evaluation and interpretation "of the dam safety surveillance and monitoring data, and provides findings on the overall performance of the dam."<sup>26</sup>

#### **4. FERC Licensing Exceptions:**

There are two types of license exceptions that a hydroelectric developer may take advantage of if his project fits the requirements. If a project qualifies for an exemption then that project would be exempt from the licensing provisions required under the FPA and subject only to the specific provisions of their licensing exemption.<sup>27</sup> The first exemption allows for a small conduit hydroelectric facility which produces up to fifteen (15) megawatts of power to be

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<sup>23</sup> Div. of Hydropower Admin. and Compliance, Compliance Handbook 2 (2004) available at: [http://www.ferc.gov/industries/hydropower/gen-info/handbooks/compliance\\_handbook.pdf](http://www.ferc.gov/industries/hydropower/gen-info/handbooks/compliance_handbook.pdf) [hereinafter *FERC Compliance Handbook*].

<sup>24</sup> *Id.*

<sup>25</sup> Monitoring the Performance of Dams 14-J-3 (2008), available at <http://www.ferc.gov/industries/hydropower/safety/guidelines/eng-guide/appendices-j-k.pdf>.

<sup>26</sup> *Id.*

<sup>27</sup> *Handbook for Hydroelectric*, *supra* note 6, at 6-1.

eligible for a Conduit Exemption. In order to be eligible for the exemption the developer must have all the real property interest needed to develop the project and the project must not be constructed on federal lands.<sup>28</sup> The second exemption is the development of a hydroelectric project of five (5) megawatts or less may be eligible for a five (5) megawatts exemption. In order to qualify for this exemption, the project must be located at a non-federal dam built before 1977 or other natural water feature. If the project only involves federal lands, any applicant is eligible. If only some federal lands are involved, an applicant who has all the real property interest in the nonfederal land necessary to develop and operate the project is eligible for the exception.<sup>29</sup>

## **B. The Army Corps of Engineers:**

### **1. Rivers and Harbors Act:**

In 1899, Congress passed the Rivers and Harbors Act (RHA), using its authority under the *Commerce Clause* of the Constitution which includes the power to regulate navigation and navigable waters.<sup>30</sup> The “navigable waters of the United States” are defined as “those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past or may be susceptible to use to transport interstate commerce.”<sup>31</sup> The RHA gives the Army Corps of Engineer (the Corps) the power to regulate the building of dams in any navigable river, or other navigable water of the United States; it is unlawful to construct a dam without first getting approval from the Corps.<sup>32</sup> Section 13 of the RHA specifically focuses on the depositing of refuse in navigable waters. Under the RHA, it is illegal to discharge, or deposit any refuse

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<sup>28</sup> 18 C.F.R. 4.31(b)(2) (2011).

<sup>29</sup> *Handbook for Hydroelectric*, *supra* note 6, at 6-2.

<sup>30</sup> U.S. Const. art. I, § 7.

<sup>31</sup> 33 C.F.R. § 328.3 (2011).

<sup>32</sup> 33 U.S.C.S. § 401 (2011).

matter of any kind into the navigable waters of the United States, or deposit material of any kind in any place on the bank of any navigable water, without permission from the Corps.<sup>33</sup>

## **2. Clean Water Act:**

In 1972 Congress amended the Federal Water Pollution Control Act (FWPCA), now known as the Clean Water Act (CWA), to restore and maintain the quality of the waters of the United States.<sup>34</sup> To achieve this goal Congress gave regulatory authority to the Environmental Protection Agency (EPA) to regulate discharges of pollutants into the navigable waters. In the 1972 amendments to the FWPCA Congress also gave the Corps the power to regulate the discharge and fill of material into navigable waters.<sup>35</sup> Under Section 404 of the CWA “navigable waters” are defined as “the waters of the United States.”<sup>36</sup> The CWA defines a pollutant as “dredged soil, solid waste, biological materials, rock, sand discharged into water.”<sup>37</sup> These are broad definitions; a hydroelectric developer will likely need to obtain a CWA permit to modify an existing dam if the project requires the developer to dredge and fill the river to make the necessary modifications to the dam to produce hydroelectricity.

## **3. RHA and CWA Permit Process:**

Obtaining a RHA and CWA permit from the Corps is generally a three step process which the Corps has consolidated into one application.<sup>38</sup> For major projects there is the pre-application consultation stage where there are several meetings between representatives of the Corps and other interested agencies with the applicant. The purpose of these meetings is to have an informal discussion about the proposed project so that a developer can make any necessary

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<sup>33</sup> *Id.* § 407.

<sup>34</sup> *Id.* § 1251(a).

<sup>35</sup> *Id.* § 1344.

<sup>36</sup> *Id.* § 1362.

<sup>37</sup> *Id.*

<sup>38</sup> Regulatory Jurisdiction Overview 3, *available at* [http://www.usace.army.mil/CECW/Documents/cecwo/reg/reg\\_juris\\_ov.pdf](http://www.usace.army.mil/CECW/Documents/cecwo/reg/reg_juris_ov.pdf) [hearinafter *Army Corps Jurisdiction Overview*].

changes prior to submission of the application.<sup>39</sup> Once the informal meetings have concluded, the formal review process stage begins. During this time an individual Corp engineer is selected as the project manager. The project manager handles the application from the beginning until the final application decision is rendered.<sup>40</sup> The project manager's duty include preparing the public notices, evaluate the impacts of the project and reviewing all comments received, and negotiates any necessary modifications to a project.<sup>41</sup>

During the permit process, the project manager shall take into account the public benefits and detriments and carefully evaluate and balance these factors which includes conservation, economics, and fish and wildlife. When evaluating a permit application the project manager shall evaluate both the public and private needs, determine any conflicts of the use of resources, evaluate any reasonable alternative locations, and determine what the permanent benefits or detrimental effects that a project would have on the public and private uses.<sup>42</sup> No permits shall be "granted if a proposal is found to be contrary to the public interest."<sup>43</sup>

Section 404 of the CWA allows the issuing of permits to hydroelectric developers "after notice and opportunity for public hearings for the discharge of dredged or fill material into the navigable waters."<sup>44</sup> Permits may be modified or denied if it is determined after notice and opportunity for public hearings that the activities proposed would have an "unacceptable adverse effect on municipal water supplies, wildlife, or recreational areas."<sup>45</sup> If a permit is denied then a notice shall be published with the findings and the reasons for making any determinations as to

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<sup>39</sup> *Id.* at 4

<sup>40</sup> *Id.*

<sup>41</sup> *Id.*

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> 33 U.S.C.S. §1344 (2011).

<sup>45</sup> *Id.*

why a permit has been denied or modified.<sup>46</sup> There is an exception to the permit requirement, if the activities proposed are for the maintenance and emergency reconstruction of dams. Because the proposed activities are modifying a dam so that it generates hydroelectricity, the actions of the hydroelectric developer would probably not qualify under these exceptions.<sup>47</sup>

The EPA has the authority under Section 404 of the CWA to veto the issuance of a license if the EPA determines that “discharges into the site will have unacceptable adverse effects on municipal water supplies, shellfish beds and fishery areas, wildlife or recreational areas.”<sup>48</sup> Under the statute the EPA may invoke its “veto” authority at any time; a permit application does not need to be pending.<sup>49</sup> Therefore, any Section 404 permit applications which a hydropower developer submits to the Army Corps of Engineers will also be approved by the EPA.

#### **4. The National Dam Inspection Act:**

In 1972, Congress authorized the Corps to create a national program to inspect the countries dams. Under the National Dam Inspection Act (NDIA), all dams in the United States shall be inspected by the Corps except those under the jurisdiction of: 1) the Bureau of Reclamation; 2) the Tennessee Valley Authority; or 3) the International Boundary and Water Commission, as well as those dams which have been constructed pursuant to licenses issued under the authority of the Federal Power Act (FPA).<sup>50</sup> Despite the FERC exception, the Corps may still inspect dams which are licensed under the FPA at FERC’s request.<sup>51</sup>

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<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

<sup>48</sup> *Army Corps Jurisdiction Overview*, *supra* note 37, at 7.

<sup>49</sup> *Id.*

<sup>50</sup> National Dam Inspection Act, H.R. 1595, 92<sup>nd</sup> Cong. § 2 (1972), *available at* <http://npdp.stanford.edu/ndia.html>.

<sup>51</sup> *Id.*

Upon completion of the inspection of a dam, the Governor of the State in which the dam is located shall be notified of the results of the investigation. If there are any hazardous conditions found at a dam during inspection, the Governor shall be immediately notified and provided with information and advice necessary to correct the hazardous conditions.<sup>52</sup> To determine whether a dam is a danger to human life or property, the inspection will evaluate the possibilities of seepage, settlement, erosion, sediment, cracking, earth movement, or other conditions which would compromise the integrity of a dam structure.<sup>53</sup>

### **C. The National Environmental Policy Act:**

In 1969, Congress enacted the NEPA with the intent to “encourage productive and enjoyable harmony between man and his environment; [and] to promote efforts which will prevent damage to the environment.”<sup>54</sup> NEPA requires agencies to disclose to the public the environmental costs of any major project which could result in environmental degradation.<sup>55</sup> The potential impacts to the environment are to be significantly considered during the decision making process.<sup>56</sup> NEPA requires a federal agency to “study, develop and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.”<sup>57</sup>

NEPA generally requires an EIS to be conducted. An EIS is a detailed statement which summaries what would be the environmental impact of the proposed action. Included in the EIS is a summary of the environmental effects which cannot be avoided, any possible alternatives available which would limit the potential impact on the environment, and a cost benefit analysis

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<sup>52</sup> *Id.* § 3.

<sup>53</sup> *Id.* § 4.

<sup>54</sup> 42 U.S.C.S. § 4321 (2011).

<sup>55</sup> *Id.*

<sup>56</sup> 42 U.S.C.S. § 4332 (2011).

<sup>57</sup> *Id.*

balancing the environmental harms proposed with the benefits the proposed activity could result from.<sup>58</sup>

NEPA impacts hydroelectric developers because the federal agencies that a developer applies for licenses from are required under NEPA to take the environmental impacts of the proposed project into consideration. Depending on the number of modifications or the extent of the project, the developer may need to prepare an EIS statement among other environmental reports, and a permit could be rejected because it does not meet the necessary environmental considerations required under NEPA.

#### **D. Challenges to Agency Decisions:**

NEPA and the CWA allow third parties who have an interest in an agency decision to challenge that decision. When a court is reviewing an agency decision made under the CWA, the reviewing court is following the Administrative Procedure Act (APA). Under the APA, a challenged agency action “must be set aside if it is found to be arbitrary and capricious, an abuse of discretion, or otherwise not in accordance with law.”<sup>59</sup> When a court is reviewing an agency decision made under NEPA, the court must determine that the agency has considered the environmental consequences of the proposed action.<sup>60</sup> If a reviewing court determines that the agency decided that the economic or social benefits were outweighed by a project's environmental cost, then that agency decision stands, provided the procedural requirements of NEPA were followed and the environmental consequences were considered in the agency's final decision.<sup>61</sup>

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<sup>58</sup> *Id.* § 4332(C) (2011).

<sup>59</sup> 5 U.S.C.S. § 706(2)(A) (2011).

<sup>60</sup> *Stycker's Bay Neighborhood Council v. Karlen*, 44 U.S. 223, 227 (1980).

<sup>61</sup> *Id.* at 227.

## **E. Comprehensive Environmental Response, Compensation, and Liability Act:**

In 1980, Congress created the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or Superfund.<sup>62</sup> The Act was created in response to the numerous unpermitted industrial hazardous waste disposal sites appearing throughout the United States and the high costs associated with cleaning up those sites.<sup>63</sup> CERCLA created a fund for the EPA to use to clean up the hazardous wastes sites. Then, CERCLA allows the EPA to go after those parties that contributed to the hazardous waste site to pay for the costs expended in cleaning up the site.<sup>64</sup>

Once a hazardous waste site has been discovered and the EPA has been notified, the CERCLA cleanup process involves many stages. The Preliminary Assessment/Site Inspection (PA/SI) stage involves an inspection of the site, and if hazardous substances are present, the site is stabilized so that the problem does not get any worse.<sup>65</sup> If the condition of the site is serious, the site is placed on the National Priorities List (NPL). Next, a Remedial Investigation and Feasibility Study (RI/FS) is done at the site to determine the extent of the contamination and the severity of the toxic substance, as well as assess the treatability of the contamination at the site.<sup>66</sup> Then, the Record of Decision (ROD) is a published document that explains all the cleanup alternatives being performed at the site and gives a full history and description of the site, including the contaminants present at the site.<sup>67</sup> Following the ROD, the Remedial Design/Remedial Action (RD/RA) stage is the long term solution designed to clean up the site

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<sup>62</sup> Allan J. Topol & Rebecca Snow, *Superfund Law and Procedure* 8 (Paulett Simonetta et al. 2005 ed. 2005) [hereinafter *Superfund Law and Procedure*]. Note: CERCLA's nickname comes from the \$1.6 billion Substance Response Trust Fund which was established when CERCLA was enacted. The fund was to be used by the government to clean up CERCLA sites. CERCLA also gives the government the authority to recoup the costs associated with cleaning up the various sites from all those parties responsible.

<sup>63</sup> *Id.* at 1.

<sup>64</sup> *Id.* at 8-9.

<sup>65</sup> Environmental Protection Agency – Superfund – Cleanup Process: <http://epa.gov/superfund/cleanup/index.htm>.

<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

and includes activities such as pumping and treating groundwater, excavating and incinerating the hazardous substances or carting the hazardous substances away for disposal at offsite facilities.<sup>68</sup> Finally, the National Contingency Plan (NCP) establishes the procedures and standards for cleaning up CERCLA sites and all government action must be consistent with the NCP.<sup>69</sup>

If a hydroelectric developer wishes to develop a dam on or near a CERCLA site then the impact that the proposed activities will have on that CERCLA site will be brought into consideration during the licensing and permit stage consistent with NEPA. If an EIS is prepared it should include a study taking these impacts into account; the public would have the ability to comment on the proposed activity before the agency issued the license or permit.<sup>70</sup>

## **F. Federal Government Renewable Energy Incentives:**

### **1. Hydroelectric Production Incentives:**

The federal government recognizes the importance of renewable energy projects and has passed several laws to promote the development of renewable energy facilities. The federal government enacted a statute that allows for incentive payments payable to hydroelectric developers. These payments are available to any qualified hydroelectric facility that is operated by a non-Federal entity which generates hydroelectric energy and “which is added to an existing dam or conduit.”<sup>71</sup> To be eligible, the construction of the dam or conduit must have been completed before August 8, 2005 and does not require any construction or enlargement of

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<sup>68</sup> *Id.*

<sup>69</sup> 42 U.S.C.S. § 9605 (2011).

<sup>70</sup> See *supra* note 55.

<sup>71</sup> 42 U.S.C.S. § 15881 (2011).

impoundment or diversion structures “in connection with the installation of a turbine or other generating device.”<sup>72</sup>

Hydroelectric developers have a ten (10) year eligibility window that began on August 8, 2005 to begin operations and become eligible for the incentive payments. Once a facility becomes qualified it may receive incentive payments for a period of ten fiscal years beginning with the “fiscal year in which electric energy generated from the facility is first eligible for such payments.” The amount that a facility is eligible is based on the number of kilowatt hours of hydroelectricity generated by the facility during the incentive period. Facilities shall be paid one point eight (1.8) cents per kilowatt<sup>73</sup> hour up to a maximum of \$750,000 in one (1) calendar year.<sup>74</sup>

## **2. Hydroelectric Efficiency Improvement Incentives:**

In addition to offering incentive payments to the development of hydropower facilities, the federal government also offers incentive payments to the owners of current hydroelectric facilities to make those facilities more efficient. Under the statute, owners and operators at existing hydroelectric facilities could qualify to receive incentive payments to make capital improvements to their facilities that are directly related to improving the facilities efficiency by at least three (3) percent.<sup>75</sup> The amount of incentive payments a facility is eligible to receive shall not exceed ten (10) percent of the costs of the capital improvements and incentive payments are not to exceed \$750,000 for improvements to a single facility.<sup>76</sup> Appropriations to this program have been authorized for each fiscal year since 2006 and end in 2015.

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<sup>72</sup> *Id.*

<sup>73</sup> *Id.* Note: The statute allows for the incentive payments be adjusted for inflation each fiscal year beginning after 2005.

<sup>74</sup> *Id.*

<sup>75</sup> *Id.* §15882.

<sup>76</sup> *Id.*

### **3. Federal Loans for Hydroelectric Development:**

In addition to offering incentive payments for the development of hydroelectric facilities, Congress has established a loan program to encourage the development of small hydroelectric power projects “in connection with existing dams which are not being used to generate electric power.”<sup>77</sup> The program allows the Secretary of Energy to loan up to ninety (90) percent of the costs for the development of feasibility studies to determine the feasibility of developing a small hydroelectric power project at existing dams, as well as prepare any applications necessary for federal, state, or local licenses. In addition to providing loans for conducting the necessary studies, as well as obtaining the necessary permits, the Secretary is authorized to make loans to a hydroelectric developer of up to seventy-five (75) percent of the cost of constructing a hydroelectric project.

Under the statute, a “small hydroelectric power project” means any hydroelectric power project that is located at the site of any existing dam, whose construction was completed on or before July 22, 2005, and that uses the water power potential of such dam and which has not more than thirty-thousand (30,000) kilowatts of installed capacity.<sup>78</sup> However, not all loans are limited to these criteria; if a project utilizes, or proposes to utilize, any natural water features for the generation of electricity, without the need of any dam structure, and is determined by the Secretary that it achieves the purpose of the development of the statute, it will be eligible for loans granted under the statute.<sup>79</sup> In addition to the project having to meet the definition of a small hydroelectric power project, no loans will be made unless the Secretary further determines that: all licenses and other required approvals necessary for a project have been issued; the

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<sup>77</sup> 16 U.S.C.S. § 2701 (2011).

<sup>78</sup> *Id.* § 2708.

<sup>79</sup> *Id.*

project will have no significant adverse environmental effects; and no significant adverse effects exist on any other “use of the water used by such project.”<sup>80</sup>

The statute also establishes a program to develop a “simple and expeditious licensing procedures under the FPA for small hydroelectric power projects in connection with existing dams.”<sup>81</sup> Before a license is issued under the FPA, the safety of the existing structures as well as the consequences of a possible structural failure must be assessed. The Council on Environmental Equality and the EPA need to consult on the possible environmental effects of a project.<sup>82</sup> The statute is specific that no projects are exempt from the NEPA, the Endangered Species Act (ESA) or any other provision of federal law.<sup>83</sup>

### **III. RHODE ISLAND REGULATIONS**

#### **A. Rhode Island Department of Environmental Management:**

To regulate environmental activities within Rhode Island, the Rhode Island Legislature created the Department of Environmental Management (DEM) within the executive branch of the government.<sup>84</sup> The duties of the Director of DEM includes supervising and controlling “the protection, development, planning, and utilization of the natural resources of the state” including water, plants, mammals, amphibians, fish, shellfish and other forms of aquatic, and animal life.<sup>85</sup> In addition, DEM is responsible for the maintenance and quality of waterways by establishing minimum standards for upland beneficial use and disposal of dredged material as well as drafting and enforcing rules for water quality, and fish and wildlife protection.<sup>86</sup> DEM is authorized to

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<sup>80</sup> *Id.* § 2703.

<sup>81</sup> *Id.* § 2705.

<sup>82</sup> *Id.*

<sup>83</sup> *Id.*

<sup>84</sup> R.I. Gen. Laws § 42-17-1.1 (2011).

<sup>85</sup> *Id.* § 42-17.1-2.

<sup>86</sup> *Id.*

work with the Rhode Island Rivers Council and cooperate with federal, interstate, state, local and private agencies and community organizations to manage Rhode Island's watershed.

### **1. Streamflow Depletion Methodology:**

DEM is authorized by Rhode Island state laws, including the Water Pollution Control Act (WPCA) and the Rhode Island Water Quality Regulations, to regulate and protect the surface waters within Rhode Island. DEM regulates these waters to meet the purposes of the CWA, to “restore, preserve, and enhance the physical chemical and biological integrity of the waters of the state.”<sup>87</sup> Vital to DEM's efforts in regulating the water quality within Rhode Island is regulating the volumes of water that can be extracted from streams so that there is still a “sufficient flow to maintain habitat conditions essential to a healthy aquatic ecosystem.”<sup>88</sup> To establish how much water can be extracted from a stream, DEM has established the Rhode Island Streamflow Depletion Methodology (SDM). SDM incorporates the natural variations of an individual streamflow, considers the ecological sensitivity of resources, and balances human and ecological needs for water according to the individual watershed characteristics of that site as well as current human influences to determine what degree a streamflow may be altered for human use but still sustain the environmental resources found there.<sup>89</sup>

SDM could impact a hydropower development project depending on where the project is located and what the projected streamflow disruption downstream is. Because of this, developers may need to apply to DEM for a groundwater withdrawal permit. In determining whether to grant or reject a permit DEM will compare the existing streamflow depletions and other site specific conditions to calculate what the allowable streamflow depletion is as well as a

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<sup>87</sup> RI Dep't Env'tl. Mgmt, Streamflow Depletion Methodology 4 (2010) *available at* <http://www.dem.ri.gov/programs/benviron/water/withdraw/pdf/stremdpl.pdf>.

<sup>88</sup> *Id.* at 1.

<sup>89</sup> *Id.* at 4.

net available streamflow depletion.<sup>90</sup> If DEM determines that there is “enough remaining capacity in the net available streamflow depletion to accommodate the proposed withdrawal,” DEM evaluates the application to determine if there are any freshwater wetland alterations.<sup>91</sup> If the application meets the criteria for streamflow depletion and wetlands review, then the application “is presumed to meet the applicable water quality and freshwater wetlands regulations.”<sup>92</sup>

## **2. Discharge of Dredge Material:**

DEM is designated as Rhode Island’s water pollution control agency for all purposes of the CWA and is “authorized to take all action necessary or appropriate to secure Rhode Island the benefits of that act.”<sup>93</sup> The Director of DEM has the authority to issue permits for the discharging of any pollutants upon conditions which are necessary to carry out the purposes of the CWA. The statute defines a pollutant as “any material or effluent which may alter the chemical, physical, biological, or radiological characteristics and/or integrity of water, including but not limited to dredged spoil.”<sup>94</sup> In addition, the Director is to adopt water quality standards that conform to the EPA’s applicable water quality rules and regulations with regards to the dredging, transporting and disposing of dredge material.<sup>95</sup> Without receiving such a permit, it is unlawful for any person to place any pollutant into any waters within Rhode Island.<sup>96</sup> A hydroelectric developer who is modifying an existing dam within the state will likely need to receive a permit from DEM if they need to dredge and fill a body of water in order to install the

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<sup>90</sup> *Id.* at 2.

<sup>91</sup> *Id.* at 4.

<sup>92</sup> *Id.* at 2.

<sup>93</sup> RI Gen laws § 46-12-2 (2011).

<sup>94</sup> *Id.* § 46-12-1.

<sup>95</sup> *Id.* § 46-12-3.

<sup>96</sup> *Id.* § 46-12-5.

necessary equipment needed to convert the existing structure so that it generates hydroelectric power.

### **3. Depositing Substances into Public Tidewaters:**

In addition to regulating dredging and filling activities, DEM is authorized to regulate the depositing of mud, dirt or any other substances in the public tidewaters of Rhode Island.<sup>97</sup> If a hydropower project's construction or modification requires a developer to deposit any substances within the tide waters of Rhode Island, the developer may need to receive permission from DEM.<sup>98</sup> If a permit is required but a developer failed to obtain the necessary permits, DEM may fine the developer one-hundred dollars for each offense.<sup>99</sup> DEM specifically prohibits a person putting anything within the Blackstone or Seekonk River if it is done in such a way which would inhibit the navigability of those rivers.<sup>100</sup>

### **4. Obstruction to Navigation:**

DEM has the power to remove any unlawful or unauthorized structure is deposited within the tidewaters of Rhode Island when that structure is liable to cause or become a danger to the safe and convenient use of the waters for navigation and other lawful purposes.<sup>101</sup> The person who is the owner or exercises any control over the obstruction including the one who has constructed or caused the obstruction shall receive notice to remove the obstruction within thirty (30) days unless an extension is granted by DEM.<sup>102</sup> If the owner fails to comply with the notice and refuses to remove the obstruction then that person could be fined one hundred dollars per day until the obstruction is removed. If the owner continues to refuse to remove the obstruction

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<sup>97</sup> *Id.* § 46-6-1.

<sup>98</sup> *Id.*

<sup>99</sup> *Id.*

<sup>100</sup> *Id.* § 46-6-4.

<sup>101</sup> *Id.* § 46-6-8.

<sup>102</sup> *Id.* § 46-6-9.

then DEM has the authority to remove the obstruction at the owners' expense.<sup>103</sup> Therefore, if a hydropower developer fails to receive the necessary permits and begins construction or modification of a dam, DEM could require that the developer remove the structure. If the developer fails to remove the structure then DEM has the authority to remove the structure at the developer's expense.

## **5. Freshwater Wetlands:**

The Rhode Island Legislature recognizes that swamps, marshes, and freshwater wetlands located throughout Rhode Island are “among the most valuable of all wildlife habitats...and are widely recognized as essential to the health and welfare of the general populace.”<sup>104</sup> Therefore, the Legislature has charged DEM with the authority to preserve and regulate the use of the freshwater wetlands throughout the Rhode Island.<sup>105</sup> If a hydroelectric developer wishes to develop a hydropower site within the freshwater wetlands of Rhode Island including any rivers, streams, flood plains and banks they may need to submit an application for approval of the project to DEM.<sup>106</sup>

If a hydropower project requires a permit, then all applications are submitted to the director of DEM requesting approval. A hydroelectric developer may request from DEM a preliminary determination whether the development of the project would require a permit to be issued.<sup>107</sup> A permit will be required if it appears that there will be a significant alteration to the wetlands.<sup>108</sup> If a permit is needed then the hydropower developer must submit an application as well as any plans and drawings of the project prepared by a registered professional engineer.<sup>109</sup>

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<sup>103</sup> *Id.* § 46-6-10.

<sup>104</sup> *Id.* § 2-1-18.

<sup>105</sup> *Id.*

<sup>106</sup> *Id.* § 2-1-20.

<sup>107</sup> *Id.* § 2-1-22.

<sup>108</sup> *Id.*

<sup>109</sup> *Id.*

During the application process the director shall notify all land owners within two-hundred (200) feet of the proposed project as well as the municipality where the project is located.<sup>110</sup> Interested parties will have forty-five (45) days to object to the project, if there are any objections then the director shall schedule a public hearing and the applicant shall be liable for any fees associated with the hearing.<sup>111</sup> The director will then make his decision whether to approve the project and issue the necessary permits.<sup>112</sup>

#### **6. Construction of Fishways:**

Because of their nature, dams have traditionally blocked the passage of anadromous fish species from being able to swim up river to their natural spawning grounds in fresh water.<sup>113</sup> As a result, the Rhode Island Legislature has authorized and directed the Department of Environmental Management to construct fishways around or through existing dams within Rhode Island. Under the statute, the owners and operators of the dams shall cooperate with DEM and shall not be liable for any damage which has resulted from the construction of the fishways.<sup>114</sup>

#### **7. Dam Safety Program:**

As stated earlier, there are approximately 674 dams within Rhode Island varying in age, size and state of repair. The potential failure of these dams could result in the loss of human life or cause major economic losses.<sup>115</sup> The Rhode Island Legislature charged DEM the task of

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<sup>110</sup> *Id.*

<sup>111</sup> *Id.*

<sup>112</sup> *Id.*

<sup>113</sup> Webster's Dictionary defines *anadromous* as "running up: said of fishes, as the salmon, that go up rivers so spawn." Webster's Student Dictionary 25 (2002 ed. 1999).

<sup>114</sup> R.I. Gen laws § 20-12-4 (2011).

<sup>115</sup> Dep't of Env'tl. Mgmt., Rules and Regulations for Dam Safety 3 (2007) available at <http://www.dem.ri.gov/pubs/regs/regs/compensp/dams07.pdf>: [hereinafter *Dam Safety Regulations*].

inspecting every dam and reservoir within the state, keep records of the inspections and, publish an annual report of that inspection every year to the Governor's office.<sup>116</sup>

**a. Dam Inspections:**

It is under this statute that DEM gains much of its authority to inspect dams as well as approve any modifications.<sup>117</sup> In order to aid in the inspection of the dams all owners and operators of dams within Rhode Island shall submit to DEM a description of the dam or reservoir as well as all the necessary survey, plans and drawings so that the dams can properly be evaluated.<sup>118</sup> To inspect dams, DEM and its agents are given the statutory authority to enter a person's private property without rendering themselves liable for trespass.<sup>119</sup> If DEM finds that the dam is unsafe or if there is reasonable cause to believe that there is a danger to life or property then the director shall determine what alterations, and repairs are necessary to make the dam safe and shall order the dam owner to comply with these determinations.<sup>120</sup> If the owner of a dam fails to comply within a timely manner DEM has the authority to carry out the actions required under the original order and the dam owner shall be liable for any costs incurred by DEM to remedy the problems.<sup>121</sup>

**b. Dam Hazard Classification:**

All of the dams located within Rhode Island are classified by DEM under the Dam Safety Program based on their size and hazard rating. Dam size is classified as either small, medium or large, based on "the storage capacity and height of the impounded water."<sup>122</sup> The hazard classification is determined based on the probable consequences of the failure or disoperation of

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<sup>116</sup> *Id.* § 46-19-1.

<sup>117</sup> *Id.* § 46-19-3.

<sup>118</sup> *Id.* § 46-19-2.

<sup>119</sup> *Id.* § 46-19-6.

<sup>120</sup> *Id.* § 46-19-4(a).

<sup>121</sup> *Id.* § 46-19-4.

<sup>122</sup> *2010 Dam Safety Report, supra* note 3, at 4.

the dam and not based on the current condition or likelihood of the dam's failure.<sup>123</sup> There are currently ninety-seven (97) "high hazard" dams which are defined as "a dam where failure or [d]isoperation will result in a probable loss of human life" and eighty-three (83) "significant hazard dams" which are defined as dams whose failure will result in no probable loss of human life but can cause major economic losses and disruptions of lifeline facilities located throughout Rhode Island.<sup>124</sup> In order to be compliant with the Dam Safety Regulations, a visual inspection of any high hazard dams must be performed every two years and visual inspections on any significant hazard dams must be completed every five years.<sup>125</sup>

Whenever a high or significant hazard dam needs to be repaired the owner must submit an application to DEM's Dam Safety Program (DSP) for approval. DEM defines repairs as including any work performed on a dam which may affect the integrity of the dam.<sup>126</sup> This includes the removal of trees, any work requiring excavation on the embankments as well as any work being performed to reinforce the embankment or removing a major structural component of a dam.<sup>127</sup> All repair applications are to include a map of the dam, reasons why the work needs to be performed, detailed plans showing what is the exact nature and complexity of the work to be performed as well as written description of what type of work will be performed.<sup>128</sup> Therefore, if any repairs need to be performed on an existing dam a hydropower developer would probably have to receive permission from DSP for any work to be performed.

### **c. Emergency Action Plans:**

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<sup>123</sup> *Id.*

<sup>124</sup> *Id.* at 5, 6.

<sup>125</sup> *Id.* at 10.

<sup>126</sup> *Dam Safety Regulations supra* note 114, at 6.

<sup>127</sup> *Id.* at 9.

<sup>128</sup> *Id.*

Because dams are a potential hazard to persons and property, any city or town in which a high or significant hazard dam is located is required to have completed an Emergency Action Plan (EAP) for the dam by July 1, 2008.<sup>129</sup> These EAPs are to be updated on an annual basis and filed with the Rhode Island Emergency Management Agency (EMA), DEM, the chief of the local police department and the local municipality's emergency management official.<sup>130</sup> The owner of any other dam, regardless of the hazard classification, may also be required to prepare an EAP if DEM deems it necessary.<sup>131</sup> The cost of developing the EAP is the dam owner's responsibility and the owner shall reimburse to the municipality the costs within ninety days of being notified that the EAP has been completed. If the dam owner fails to reimburse the municipality for the costs associated with developing the EAP then the municipality shall have a valid legal claim against the dam owner for the EAP development costs as well as any costs associated with the pursuit of a legal claim.<sup>132</sup>

#### **B. Coastal Resources Management Council:**

The Rhode Island Coastal Resources Management Council (CRMC) has jurisdiction over power generation facilities which have the capability of generating greater than forty (40) megawatts of electricity.<sup>133</sup> If a hydroelectric developer wishes to develop a hydroelectric facility capable of generating greater than forty (40) megawatts of electricity than that developer will likely have to submit a permit application to CRMC. CRMC will review the permit application and determine whether such a hydroelectric facility has a reasonable probably of

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<sup>129</sup> R.I. Gen. Laws § 46-19-9 (a) (2011).

<sup>130</sup> *Id.* § 46-19-9 (c).

<sup>131</sup> *Id.* § 46-19-9 (b).

<sup>132</sup> *Id.* § 46-19-9 (d).

<sup>133</sup> Coastal Res. Mgmt. Program § 320(A)(1) (2010) *available at*: <http://www.crmc.ri.gov/regulations/RICRMP.pdf>.

conflicting with CRMC regulations including the “Redbook” and Special Area Management Plans (SAMP) or which activities have the potential to damage the coastal environment.<sup>134</sup>

A hydroelectric developer applying for a CRMC permit must show that the hydroelectric development satisfies the requirements specified within the Redbook as well as any special area management plans specific to where the developer wishes to develop that hydroelectric facility. A developer must also submit a Stormwater Management Plan, a soils map of the property where the proposed project is to be developed, an overlay map of the site showing the principle vegetation types and any significant historical features, roadways, buildings, parking areas, drainage systems, and sewage systems.<sup>135</sup>

Hydroelectric developers who are applying for a permit from CRMC are required to show a need for the development of the hydroelectric facility.<sup>136</sup> In addition the developer must show that all applicable codes including zoning ordinances, and flood hazard standards have been met.<sup>137</sup> The application must list the boundaries of the coastal waters which the proposed project will affect and show that the project will not have any significant impacts in erosion, plant and animal life, or interfere with any existing public access or use of the tidal waters.<sup>138</sup> A developer is also required to show that there will not be any significant impacts to water flow and circulation, or a significant deterioration in the quality of the waters.<sup>139</sup> The hydroelectric development must also not impact other water dependent uses such as boating, fishing, swimming or navigation, and minimize any adverse scenic impacts to the area.<sup>140</sup> These findings must be submitted in writing to CRMC.

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<sup>134</sup> *Id.* § 320 (B)(1).

<sup>135</sup> *Id.* § 320(B)(3).

<sup>136</sup> *Id.* § 300(1)(1).

<sup>137</sup> *Id.* § 300(1)(2).

<sup>138</sup> *Id.* § 300(1)(5).

<sup>139</sup> *Id.* § 300(1)(8).

<sup>140</sup> *Id.* § 300(1)(10).

In addition to the requirements listed above, the 1978 amendments to the Rhode Island Coastal Resources Management Program require additional impacts to be reviewed during the application process with regards to the construction, operation, decommissioning and waste disposal at a proposed hydroelectric site.<sup>141</sup> These topics include any “environmental impacts, social impacts, economic impacts, alternatives sites, alternative means to fulfill the need for the facility, demonstration of the need, and consistency with state and national energy policies.”<sup>142</sup>

### **C. Hydroelectric Development Incentives:**

The costs associated with developing a hydroelectric dam are high. There are licensing and permit costs, construction and modification costs, as well as the daily maintenance and repairs associated with maintaining a hydroelectric dam. However, to help offset these costs and promote the development of hydroelectric dams, the Rhode Island Legislature passed a bill establishing tax incentives for owners of existing dams who convert those dams into hydro-electrical generating facilities.<sup>143</sup>

Under the statute an “existing dam” is any dam located within Rhode Island whose construction was completed on or before May 20, 1981 and does not require any modification to impoundment structures other than repairs or reconstruction, in connection with the installation of the installation of the hydro electrical project which has the maximum electrical output of no more than fifteen-thousand (15,000) kilowatts of installed capacity.<sup>144</sup> A qualifying hydroelectric developer could be eligible for a state income tax credit in the amount of ten (10)

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<sup>141</sup> *Id.* § 300.8(D)(1).

<sup>142</sup> *Id.*

<sup>143</sup> *R.I. Gen. Laws* § § 44-30-20.

<sup>144</sup> *Id.* § 44-30-21.

percent of the installation costs of a hydropower facility limited to \$500,000 in expenditures for a maximum income tax credit of \$50,000 dollars.<sup>145</sup>

#### **IV. RHODE ISLAND MUNICIPAL ORDINANCES**

##### **A. Dam Management Districts:**

In a report published in 2007, DEM found that approximately sixty percent of dam failures investigated were caused by lack of maintenance that resulted in surface erosion, slope protection damage or deterioration of outlet pipes. Many of the existing dams within Rhode Island have not been properly maintained and pose a significant threat to public safety, property and natural resources.<sup>146</sup> In order to assist with the maintenance of existing Dams in Rhode Island, the Legislature passed a law allowing for the creation of Dam Management Districts (DMD). The purpose of creating the DMDs is to ensure that dams are properly operated, maintained, repaired and/or removed. Because the cost of accomplishing these goals is significant and reoccurring, local communities are allowed to form DMDs as a way of managing the dams located within their districts.<sup>147</sup>

##### **1. Structure of DMDs:**

Under the statute DMDs are corporate bodies, which exist separate from the municipalities which created them as well as the state for the purpose of managing the dams and providing for dam safety within the municipality.<sup>148</sup> Municipalities are not limited to the creation of one DMD, and multiple municipalities can come together and establish and multi-municipal dam management district if they wish to.<sup>149</sup> Under the state statute municipalities can allow the DMDs to have the power to provide for officials engaging in the necessary periodic

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<sup>145</sup> *Id.* § 44-30-22.

<sup>146</sup> *Dam Safety Regulations supra* note 114, at 3.

<sup>147</sup> R.I. Gen. Laws § 45-62-1(2011).

<sup>148</sup> *Id.* § 45-62-2.

<sup>149</sup> *Id.* § 45-62-3.

inspection, maintenance and or repair of dams and appurtenant facilities as well as the ability to enter onto private property within the district. DMDs also provide for the supervision, control, maintenance, repair and/or reconstruction of dams. The DMDs can also establish public education programs to educate residents on information about the dam such as its maintenance and operation. DMDs have the power to raise funds for the expenses associated with the operation of the DMD, including the cost of employing a staff, counsel, and consultants as necessary to carry out the functions of the DMD. The DMDs are also authorized to hold, real or personal property, and to own, operate, maintain, repair, and improve any property acquired.<sup>150</sup>

## **2. Examples of Dam Management Districts:**

Since the passage of the statute the Boone Lake Dam Management District (B.L. DMD) and the Pascoag Reservoir/Echo Lake Dam Management District (P. DMD) have been created. The B.L. DMD was created by the town of Exeter and encompasses the area of the town known as Boone Lake or Boone Lake Shores.<sup>151</sup> The P. DMD is a multi-jurisdictional DMD created by the Town Councils of Burrillville and Glocester and includes the properties which adjoin and abut the Pascoag Reservoir/Echo Lake or the properties which have direct access to the lake, as well as the properties which enjoy access to the Reservoir by deed or some other recorded instrument.<sup>152</sup>

Both DMDs were established for relatively the same purpose, as an example of how a town can establish a DMD the focus will primarily be on the structure of the B.L. DMD. The purpose of the B.L. DMD was created to collect money for the costs of maintaining and repairing State Dam No. 219 as well as giving the B.L. DMD the ability to raise money, borrow money

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<sup>150</sup> *Id.*

<sup>151</sup> Boone Lake Dam Management District § I, *available at* [http://boonelakeri.org/pdfs/boone\\_lake\\_dam\\_district\\_ordinance.pdf](http://boonelakeri.org/pdfs/boone_lake_dam_district_ordinance.pdf) [hereinafter *Boone Lake DMD*].

<sup>152</sup> Ordinance Establishing the Pascoag Reservoir/Echo Lake Dam Mgmt. Dist., *available at* <http://prdmd.org/documents/3-11-09%20DMgmt%20As%20Adopted.pdf> [hereinafter *Echo Lake DMD*].

and repay any money borrowed through the sale and redemption of bonds or other securities.<sup>153</sup> Each owner of property located within the B.L. DMD shall have one vote for each parcel of land they own on matters concerning the DMD. At the meetings topics for discussion include, what work needs to be done on the dam and facilities, and the purchasing of necessary equipment. At the meetings all matters with the exception of officer elections are determined by a majority vote; elections are determined by who has the most votes for the particular office.<sup>154</sup>

The B.L. DMD ordinance established a mathematical equation to determine how much an individual land owner contributes to the budget of the DMD that year. The amount due is determined by dividing the value of that persons parcel of land with the combined total assessed values of the properties within the DMD. Then that figure is multiplied by the DMD's budget for that year.<sup>155</sup> The annual budget is created to build a reserve fund which could be accessed if there is any dam maintenance and repairs which need to be completed without over burdening property owners in the DMD to pay for those costs.<sup>156</sup>

## **B Municipal Soil and Erosion Control Ordinances:**

### **1. Rhode Island Legislature Model Ordinance:**

The Rhode Island Legislature drafted a model ordinance to encourage Rhode Island municipalities to develop their own soil erosion prevention ordinances after. In the model ordinance a municipality may adopt the ordinance if it finds that there is soil eroding from areas which are currently undergoing development and to prevent such soil erosion from occurring by requiring prevention methods be put in place.<sup>157</sup> The model ordinance is applicable to any situation where there is the disturbance of terrain within a municipality. The model ordinance is

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<sup>153</sup> *Boone Lake DMD supra* note 151.

<sup>154</sup> *Id.*

<sup>155</sup> *Id.* § IV.

<sup>156</sup> *Id.* § I.

<sup>157</sup> R.I. Gen Laws § 45-46-5 (2011).

important to hydroelectric developers because there could be a municipal ordinance in place in a municipality where the hydroelectric developer proposes developing a project.

Under the model ordinance, it is “unlawful for any person to disturb any existing vegetation, grades, and contours of land in a manner which may increase the potential for soil erosion, without first applying for a determination of applicability from the building official.”<sup>158</sup> When determining whether the ordinance is applicable to a project the official shall consider site topography, and drainage as well as the proximity to bodies of water.<sup>159</sup> The ordinance is not applicable to a site if the land disturbed at the site is “insignificant and represents no threat to adjacent properties or to the quality of any coastal feature or watercourse.”<sup>160</sup>

#### **a. Application Process**

When applying to obtain approval for a land disturbing activity the applicant must first file an “erosion and sediment control plan” which includes the proposed erosion and sediment control measure which will be employed during the activity.<sup>161</sup> Building officials will distribute copies of the plan to those necessary authorities including the public works department, the planning board or planning department for review and comments.<sup>162</sup> The building official then reviews the comments of those authorities who reviewed the plan and make his final decision in writing either approving or disapproving the plan with reasons stated.<sup>163</sup> The building official may attach conditions when approving a plan which are reasonably necessary to prevent soil erosion such as erecting walls, drains, and dams.<sup>164</sup>

#### **b. Municipal Adoption of the Model Ordinance:**

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<sup>158</sup> Id.

<sup>159</sup> Id.

<sup>160</sup> Id.

<sup>161</sup> Id.

<sup>162</sup> Id.

<sup>163</sup> Id.

<sup>164</sup> Id.

Several municipalities throughout the Rhode Island have passed soil erosion ordinances which would require a hydropower developer to receive permission and possibly apply for permits to develop a project. These municipalities include South Kingstown, Providence, Cranston and Cumberland, Rhode Island. Many of these ordinances are based off the model ordinance and require a hydropower developer to submit an erosion and sedimentation plan for approval.<sup>165</sup>

### **C. Municipal Wetland Ordinances**

In addition to soil erosion control ordinances, several municipalities have passed ordinances regarding the draining and filling of freshwater wetlands which may affect a hydropower development. An example of one such ordinance was passed by the Town of Tiverton, Rhode Island. The ordinance requires that no freshwater wetland shall be excavated, drained or filled. The ordinance also prohibits the diverting of any water to flow into or out of the wetland and any activities which could alter the character of the wetland without prior approval of the director of the DEM and the Town of Tiverton.<sup>166</sup> Under this ordinance, if a hydropower developer's activities would cause any water to flow into a wetland and change the character of any wetland the developer would probably have to seek approval from both DEM and the Town of Tiverton prior to such activities.

## **V. MASSACHUSETTS AND CONNECTICUT STATE LAWS**

When the Rhode Island Legislature passed the Renewable Energy Standard they found that many states including Massachusetts and Connecticut have passed similar laws.<sup>167</sup> Therefore,

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<sup>165</sup> South Kingstown, R.I., Code § 20-58 (2010); Providence, R.I., Code § 5-104 (2010); Cranston, R.I., Code § 15.28.040 (2010); Cumberland, R.I., Code § 20-107 (2010).

<sup>166</sup> Tiverton, R.I., Code § 6 (2010).

<sup>167</sup> See *Supra* Note 1.

for future guidance it might be helpful to look at what other laws Massachusetts and Connecticut have passed.

## **A. Massachusetts State Laws:**

### **1. Alternative Energy Portfolio:**

The Massachusetts Legislature passed the Alternative Energy Portfolio (AEP) which requires the Massachusetts Department of Energy Resources (DER) to set a minimum standard for all retail electricity suppliers who sell electricity to end-use customers within Massachusetts generated from alternative energy sources. DER is to determine annually the “minimum percentage of kilowatt hour sales to end-use customers in the Commonwealth which shall be derived from alternative energy generating sources.”<sup>168</sup> The statute lists several alternative energy sources not limited to just the traditional renewable energy sources such as solar, wind and hydropower. Included in the list is flywheel energy storage, and efficient steam technology.<sup>169</sup> The statute is different from the Rhode Island Renewable Energy Standard because the statute does not specify what shall be the percentages of electricity generated from renewable energy. Instead the statute allows DER to determine what shall be the standards. In addition the statute is not limited to just renewable energy resources but alternative energy resources which shall include certain fossil fuel generated power.<sup>170</sup>

### **2. Massachusetts Department of Conservation and Recreation:**

The Massachusetts Legislature created within the Department of Conservation and Recreation (DCR) a division of water supply protection (DWSP). DWSP is allowed to construct, maintain and operate watersheds, reservoirs, water rights, and rights in sources of water supply so that there is a sufficient supply of drinkable water to the Massachusetts Water Resources

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<sup>168</sup> Mass. Ann. Laws ch 25A, § 11F1/2 (2011).

<sup>169</sup> *Id.*

<sup>170</sup> *Id.*

Authority.<sup>171</sup> In creating the DWSP, the Massachusetts Legislature gave exclusive rights to any hydroelectricity developed and sold which is a result of the operation of the watershed and waterworks systems which DWSP developed.<sup>172</sup> All revenues generated from these hydroelectric operations are deposited into the Water Supply Protection Trust (WSPT).<sup>173</sup> Monies from the WSPT are to be spent maintaining and operating the DWSP including the costs of capital improvements which are “necessary to ensure the safety and purity of the water supply and protection of watershed lands pursuant to state and federal standards.”<sup>174</sup>

### **3. Massachusetts Department of Environmental Management:**

Similar to Rhode Island, the Massachusetts Department of Environmental Management (MA. DEM) is the primary state agency which regulates the dams within Massachusetts including their construction, inspection, and maintenance.<sup>175</sup> Massachusetts developed a dam safety act similar to Rhode Island’s which requires MA. DEM to regulate and oversee dam safety throughout the Massachusetts. Under the act, dam owners are required to register their dams with MA. DEM. This registration process requires dam owners to submit the location and dimensions of the dam and any information necessary for MA.DEM to regulate that dam.<sup>176</sup> If a dam owner fails to register his dam he shall be subject to fines as well as be subject to an inspection by MA. DEM, the authority permitted to enter a property to obtain requisite information.<sup>177</sup> If a dam is sold to a new owner, the new registered owner shall notify Mass

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<sup>171</sup> Mass. Ann. Laws ch 92A1/2, § 2 (2011).

<sup>172</sup> *Id.*

<sup>173</sup> *Id.*

<sup>174</sup> Mass. Ann. Laws ch. 10, § 73 (2011).

<sup>175</sup> Mass. Ann. Laws ch. 253 § 45A (2011); Mass. Ann. Laws ch. 253 § 45 (2011); Mass. Ann. Laws ch. 253 § 46 (2011).

<sup>176</sup> Mass. Ann. Laws ch. 253 § 45 (2011)..

<sup>177</sup> *Id.*

DEM of the transfer of the legal title of the dam within ten (10) days after the date of transfer of ownership.<sup>178</sup>

**a. Dam Construction Permits:**

No dam can be constructed or altered in Massachusetts without first being approved by MA. DEM. When applying for a permit a developer shall submit all plans, specifications, and documents certified by a professional engineer and MA DEM has sixty (60) days to approve or deny all permits.<sup>179</sup> A professional civil engineer shall supervise the construction of any dam approved paid for by the developer. Throughout the construction of the dam the engineer may be required to submit construction reports as well as reports once construction is complete as well as certify that the dam has been constructed in accordance with the approved permits.<sup>180</sup> MA. DEM retains the right to discontinue and terminate construction if it is determined that construction of the dam does not conform to the plans and specifications which were approved by MA. DEM.<sup>181</sup>

In Massachusetts, dam owners must file a dam inspection form which contains information that states the present condition of the dam, the safety and adequacy of the dam and any other information required.<sup>182</sup> The dam inspection forms are to be signed by a registered professional engineer and failure to submit the forms on time will result in fines as well as an inspection of the facility by MA. DEM at the owners' expense.<sup>183</sup> If a dam is determined to be unsafe, MA. DEM has the authority to take immediate corrective action, which includes the authority to alter, repair or remove the dam or if the threat is not as severe, may order a thorough

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<sup>178</sup> *Id.*

<sup>179</sup> *Id.* § 45A.

<sup>180</sup> *Id.*

<sup>181</sup> *Id.*

<sup>182</sup> *Id.* § 46.

<sup>183</sup> *Id.*

evaluation of the facility by a civil engineer.<sup>184</sup> The civil engineer will recommend what needs to be done to make the facility safe and Mass DEM will meet with the owner to establish a plan to correct the problem as well as determine when the problem will be completed.<sup>185</sup>

**b. Dam Inspections:**

Similar to Rhode Island, MA. DEM is to submit a report each year which discusses the effectiveness of the dam inspection and regulation program to the joint committee on natural resources and agriculture, and to the senate and house committees on ways and means, as well as make the report available to all interested parties.<sup>186</sup> Within this report is the number of inspections performed during the year, any dams which were determined to be unsafe within Massachusetts, and the corrective steps taken to improve the safety at those facilities.<sup>187</sup> These reports are similar to dam safety reports that Rhode Island's DEM submits annually to the Governor.

**B. Connecticut:**

**1. Connecticut Renewable Energy Portfolio**

Connecticut has also passed its own renewable energy standard; however, Connecticut's Renewable Energy Portfolio (REP) is more similar to Rhode Island's Renewable Energy Standard than Massachusetts's Alternative Energy Portfolio. The REP specifies how much electricity sold within the state is to be generated from a renewable energy source similar to Rhode Island's RES.<sup>188</sup> Under the REP, no less than twenty (20) percent of energy sold within

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<sup>184</sup> *Id.*

<sup>185</sup> *Id.*

<sup>186</sup> *Id.* § 48A.

<sup>187</sup> *Id.*

<sup>188</sup> Conn. Gen. Stat. § 16-245(a) (2011).

Connecticut is to be generated by a Class I renewable energy source, and an additional three (3) percent shall be from either a Class I or Class II renewable energy source by 2020.<sup>189</sup>

Connecticut's REP defines a Class I renewable energy source as energy derived from solar, wind, fuel cell, methane gas from landfills, and several other renewable energy sources; additionally, it defines a renewable energy source as a "run-of-the-river hydropower facility provided such facility has a generating capacity of not more than five (5) megawatts, does not cause an appreciable change in the river flow, and began operation after July 1, 2003."<sup>190</sup> A Class II renewable energy source means energy derived from a trash-to-energy facility, as well as a "run-of-the-river hydropower facility provided such facility has a generating capacity of not more than five (5) megawatts, does not cause an appreciable change in the riverflow, and began operation prior to July 1, 2003."<sup>191</sup> Rhode Island does not classify renewable energy, under the RES, energy generated from a hydropower facility whose total generating capacity does not exceed thirty (30) megawatts qualifies is an applicable source of renewable energy under the standard.<sup>192</sup> Rhode Island's RES does not take a facilities age into account as well as the environmental impact that a facilities has caused.

## **2. Connecticut Environmental Protection**

### **a. Construction Permits**

If a hydroelectric developer wishes to build, alter, rebuild or substantially repair any dams, they need to submit an application and receive a permit from Connecticut Environmental Protection Agency (CEPA).<sup>193</sup> Applications are to be submitted in triplicate and include all necessary drawings, plans, and specifications needed. If the CEPA is going to grant a permit,

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<sup>189</sup> *Id.*

<sup>190</sup> *Id.* § 16-1(a)(26).

<sup>191</sup> *Id.* § 16-1(a)(27).

<sup>192</sup> *See supra* note 2.

<sup>193</sup> Conn. Gen. Stat. § 22a-403 (2011).

they shall notify the applicant and publish a notice of their intention in the area where the project is to be undertaken or effect.<sup>194</sup> The CEPA shall also notify the municipality where the project is to be undertaken or effect as well as the inland wetland agency directly.<sup>195</sup>

When a dam is approved for construction, CEPA shall supervise and inspect the construction of the structure to the “extent necessary to determine whether the structure will be safe and secure.”<sup>196</sup> The CEPA may also assign an inspector to supervise the construction of the structure and the cost for such an inspector shall be shared by the state of Connecticut and the owner of the dam.<sup>197</sup> Once work has been completed the owner of the facility shall file with CEPA plans and descriptions of the completed construction.<sup>198</sup> When it is determined that an existing structure is safe or has been made safe or if any new structure has been constructed pursuant to a properly issued permit, the commissioner of the CEPA shall issue a certificate to the owner of the facility approving the structure. The certificate of approval shall be filed by the dam’s owner in the land records in the municipalities where the structure is located.<sup>199</sup>

Under Connecticut law, the Commissioner of CEPA has the authority to formulate all rules, definitions and regulations to regulate dams. CEPA officials have the authority to enter private property to investigate and gather data concerning dams, watersheds, sites, structures and general conditions.<sup>200</sup> Similar to Rhode Island and Massachusetts, Connecticut has created their own dam inspection program within CEPA. Under the statute the CEPA shall make periodic inspections of all structures and if any structure is found to be unsafe then the owner of structure

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<sup>194</sup> *Id.*

<sup>195</sup> *Id.*

<sup>196</sup> *Id.* § 22a-404.

<sup>197</sup> *Id.*

<sup>198</sup> *Id.*

<sup>199</sup> *Id.* § 22a-405.

<sup>200</sup> *Id.* § 22a-401.

shall be ordered to place the structure in a safe condition or remove it.<sup>201</sup> If an owner does not make the necessary repairs within the time period specified within the notice, then CEPA may proceed to order the owner to make the necessary maintenance or repairs.<sup>202</sup>

### **b. Dam Inspection Program**

Connecticut's dam inspection program also allows a municipality to inspect a dam that is under the jurisdiction of CEPA and is located within the boundaries of that municipality, when there is a reasonable belief that there is a public safety concern.<sup>203</sup> Prior to the inspection the municipalities inspector must notify the CEPA commissioner, make a reasonable attempt to notify the dam's owner, and file a report with the commissioner of CEPA within seven (7) days of completing the inspection. In addition, a representative of the hydroelectric power generating facility must accompany the inspector.<sup>204</sup>

## **VI. NON-GOVERNMENTAL ORGANIZATION CERTIFICATION**

### **A. The Low Impact Hydropower Institute:**

#### **1. About the Low Impact Hydropower Institute:**

The Low Impact Hydropower Institute (LIHI) is a non-profit organization dedicated to reducing the environmental impacts usually associated with hydroelectric power generation by developing a certification program which certifies hydroelectric facilities based on certain environmental criteria.<sup>205</sup> The goals of the certification program is to reduce the environmental impacts of hydropower generation, as well as create a credible and accepted standard which consumers will be able to use in evaluating whether the hydroelectric generated is

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<sup>201</sup> *Id.* § 22a – 402.

<sup>202</sup> *Id.*

<sup>203</sup> *Id.*

<sup>204</sup> *Id.*

<sup>205</sup> Low Impact Hydropower Inst. – About Us, <http://www.lowimpacthydro.org/about.html>

environmentally friendly.<sup>206</sup> In order for a hydropower facility to be certified as low impact the programs looks into “river flows, water quality, fish passage and protection, watershed protection, threatened and endangered species protection, cultural resource protection, recreation, and facilities recommended for removal.”<sup>207</sup> If a facility meets the standards under the eight criteria then that facility will be certified as a Low Impact Hydropower Facility by the Institute.

The LIHI found that when a dam is properly sited and well-operated the environmental impacts associated with dams such as flooding river habitat, blocking fish passage, altering natural flow cycles, and degrading water quality, can be reduced.<sup>208</sup> The LIHI does not take into account the size of a dam or its power generating potential capabilities because LIHI studies have found that small dams can be constructed and operated in a way which is harmful to the environment while a large dam can be modified to reduce its environmental impact.<sup>209</sup>

## **2. Low Impact Hydropower Institute Certification Process:**

The LIHI Certification Program is entirely voluntary. In order to be eligible and begin the certification process a hydroelectric developer submits their application materials and any supporting information as well as a payment of \$750 to the LIHI.<sup>210</sup> Upon receipt of the application, the application will be submitted to an Application Reviewer who will perform an Intake Review of the materials and assess whether any information is missing and determine any initial substantive issues presented in the application.<sup>211</sup> The findings of the Intake Review will

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<sup>206</sup> Low Impact Hydropower Inst., Certification Handbook, pg. 3 (2011) *available at* <http://www.lowimpacthydro.org/assets/files/LIHi%20Handbook2011/LIHI%20Handbook,September%202011.pdf>. [hereinafter *LIHI Certification Handbook*].

<sup>207</sup> *Id.*

<sup>208</sup> *Id.*

<sup>209</sup> *Id.* at 4.

<sup>210</sup> *Id.* at 5.

<sup>211</sup> *Id.*

be forwarded to the Executive Director who will notify the applicant of the additional fees required to complete a full application review.<sup>212</sup>

If the applicant decides to proceed with the certification process the developer pays the additional fees for certification and the application will be posted on LIHI's website for public comment from the community for sixty (60) days.<sup>213</sup> Once the comment period is over the Application Reviewer will then complete their review including any factual investigations needed to resolve dispute and fully evaluate any public claims made. The Executive Director will then review the Application Reviewer's findings and certification recommendations and present the results to the LIHI's governing board who will then vote to grant certification and a decision will be posted on the LIHI's webpage for thirty (30) days for public review and possible requests for an appeal.<sup>214</sup> If no appeals are received then the decision becomes final. If there is an appeal those appeals are referred to the Appeals Panel for review and then submitted to the Governing Board to approve the Appeals Panel's final decision.<sup>215</sup>

LIHI does not certify every type of hydroelectric facility and there are certain criteria required for a facility to be eligible for certification. First, an existing facility is a dam and powerhouse which generates electricity as of August 1998.<sup>216</sup> New hydropower facilities are existing dams which have added or increased their power generating capacity after August 1998.<sup>217</sup> This includes any existing dams which have developed the ability to generate hydropower so long as any modifications or additions to the existing facility including the existing dam and powerhouse and did not require the construction of a new dam. In addition,

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<sup>212</sup> *Id.*

<sup>213</sup> *Id.*

<sup>214</sup> *Id.* at 6.

<sup>215</sup> *Id.*

<sup>216</sup> *Id.* at 8.

<sup>217</sup> *Id.*

any modifications performed did not include or require any change in water flow through the facility that worsened conditions for fish, wildlife or water quality. The existing dam at the time of the modifications was not recommended for removal or decommissioning by resource agencies or a broad representation of interested persons in the local or regional community.<sup>218</sup>

### **3. Certification Environmental Considerations**

As previously discussed, the LIHI certification process takes into account a facilities impact on the environment in eight different criteria. The LIHI looks at the flows of a dam to ensure that has a healthy flow for fish, wildlife and water quality, including seasonal flow fluctuation where appropriate.<sup>219</sup> All applicants must demonstrate that a facility is in compliance with state water quality standards as well as a proving that the facility has not impaired the water quality under CWA Section 303(d).<sup>220</sup> If necessary, the facility is providing effective fish passage “for riverine, anadromous and catadromous fish, and protects fish from entrainment.”<sup>221</sup>

A FIHI certified facility must be in compliance resource agency and FERC recommendations regarding any watershed protection and mitigation or enhancement. All FIHI facilities must be designed to ensure that they do not negatively impact any state or federally endangered species or negatively affect any threatened species.<sup>222</sup> A facility must ensure that all cultural resources are protected either through FERC licensing provisions, or a plan developed by and approved by a relevant state or federal agency. In addition, a facility must provide access to the water without fees and accommodate recreational activities. Finally any facilities recommended for removal will not be certified by the LIHI.<sup>223</sup>

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<sup>218</sup> *Id.*

<sup>219</sup> *Id.* at 13.

<sup>220</sup> *Id.*

<sup>221</sup> *Id.*

<sup>222</sup> *Id.* at 14.

<sup>223</sup> *Id.*

#### **4. Low Impact Hydropower Institute Certification in Rhode Island:**

Currently the only hydropower facility in Rhode Island is the Pawtucket Project located on the Blackstone River.<sup>224</sup> The facility was originally certified in 2004 and had a certification which was valid for five years. In 2009 the facility applied for their certification renewal which was granted on March 4, 2010 and will be valid for five years expiring on April 23, 2014. By being certified, the facility has demonstrated that it meets the eight criteria examined by the LIHI and the owner or operator can market the power generated from the facility to consumers as produced by a LIHI certified facility.<sup>225</sup>

#### **CONCLUSION**

Hydroelectric development in Rhode Island has the potential to help meet requirements under The Renewable Energy Standard passed by the Legislature. As discussed above, there are several federal, state and local permits which a hydropower developer would possibly need to obtain before a project is developed depending on the specific circumstances surrounding that project. However, there are also several federal and state incentives which a hydropower developer could potentially take advantage of to assist with the costs associated with developing a hydropower project.

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<sup>224</sup> Low Impact Hydropower Inst. – Pawtucket Project Re-Certified; <http://www.lowimpacthydro.org/lihi-certificate-11-pawtucket-project-blackstone-river-rhode-island-ferc-3689.html>.

<sup>225</sup> Low Impact Hydropower Inst. – Certified Facilities; <http://www.lowimpacthydro.org/certified-facilities/?sel=RI>.

## APPENDIX A: Glossary

**Alternative Energy Generating Source:** Electricity generated using any of the following: (1) gasification with capture and permanent sequestration of carbon dioxide; (2) combined heat and power; (3) flywheel energy storage; (4) any facility which substitutes any portion of its fossil fuel source with an equal to or greater portion of an alternative, paper-derived fuel source approved by the department of environmental protection through a beneficial use determination for the production of heat or power; (5) energy efficient steam technology; or (6) any other alternative energy technology approved by the department under an administrative proceeding. Mass. Ann. Laws ch 25A, § 11F1/2 (2011).

**Anadromous:** Running up: said of fishes, as the salmon, that go up rivers so spawn. Webster's Student Dictionary 25 (2002 ed. 1999).

**Class I Renewable Energy Source:** (1) energy derived from solar power, wind power, a fuel cell, methane gas from landfills, ocean thermal power, wave or tidal power, low emission advanced renewable energy conversion technologies, a run-of-the-river hydropower facility provided such facility has a generating capacity of not more than five megawatts, does not cause an appreciable change in the river flow, and began operation after July 1, 2003, or a sustainable biomass facility with an average emission rate of equal to or less than .075 pounds of nitrogen oxides per million BTU of heat input for the previous calendar quarter, except that energy derived from a sustainable biomass facility with a capacity of less than five hundred kilowatts that began construction before July 1, 2003, may be considered a Class I renewable energy source, or (B) any electrical generation, including distributed generation, generated from a Class I renewable energy source. Conn. Gen. Stat. § 16-1(a)(26) (2011).

**Class II Renewable Energy Source:** Energy derived from a trash-to-energy facility, a biomass facility that began operation before July 1, 1998, provided the average emission rate for such facility is equal to or less than .2 pounds of nitrogen oxides per million BTU of heat input for the previous calendar quarter, or a run-of-the-river hydropower facility provided such facility has a generating capacity of not more than five megawatts, does not cause an appreciable change in the riverflow, and began operation prior to July 1, 2003. Conn. Gen. Stat. § 16-1(a)(27) (2011).

**Clean Water Act Pollutant:** Dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. 33 U.S.C.S. § 1362 (2011).

**Conduit:** Any tunnel, canal, pipeline, aqueduct, flume, ditch, or similar manmade water conveyance that is operated for the distribution of water for agricultural, municipal, or industrial consumption and not primarily for the generation of electricity. 18 C.F.R. 4.30(a)(2) (2011).

**Dam:** Any barrier made by humans, including appurtenant works, that impounds or diverts water. Dep't of Env'tl. Mgmt., Rules and Regulations for Dam Safety 4 (2007) *available at:* <http://www.dem.ri.gov/pubs/regs/regs/compinsp/dams07.pdf>.

**Environmental Impact Statement:** A detailed statement by the on: (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. 42 U.S.C.S. § 4332(C) (2011).

**Existing Dam:** Any dam located in this state or immediately adjacent to it, the construction of which was completed on or before May 20, 1981, and which does not require any construction or enlargement of impoundment structures, other than repairs or reconstruction, in connection with the installation of any small hydroelectric power project. R.I. Gen. Laws § 44-30-21(1) (2011).

**Existing Dam or Conduit:** For federal hydroelectric production incentives these include any dam or conduit the construction of which was completed before [Aug. 8, 2005] and which does not require any construction or enlargement of impoundment or diversion structures (other than repair or reconstruction) in connection with the installation of a turbine or other generating device. 42 U.S.C.S. § 15881 (2011).

**Fresh Water Wetlands:** Rhode Island legislature define freshwater wetlands as including but not limited to, marshes, swamps, bogs, ponds, rivers, river and stream flood plains and banks, areas subject to flooding or storm flowage, emergent and submergent plant communities in any body of fresh water including rivers and streams and that area of land within fifty feet (50') of the edge of any bog, marsh, swamp or pond. R.I. Gen. Laws § 2-1-20(4) (2011).

**High Hazard Dams:** A dam where failure or misoperation will result in a probable loss of human life. Dep't of Env'tl. Mgmt., Rules and Regulations for Dam Safety 6 (2007) *available at:* <http://www.dem.ri.gov/pubs/regs/regs/compinsp/dams07.pdf>.

**Navigable Waters of the United States:** Those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past or may be susceptible to use to transport interstate commerce. 33 C.F.R. § 328.3 (2011).

**Net Available Stream Flow Depletion:** This is a calculation that the Rhode Island Department of Environmental Management does when reviewing an application for a groundwater withdrawal permit. DEM compares the existing streamflow depletion and takes into consideration withdrawals, return flows and other site specific conditions to the calculated allowable streamflow depletion. This number could be either positive or negative. RI Dep't Env'tl. Mgmt, Streamflow Depletion Methodology 4 (2010) *available at* <http://www.dem.ri.gov/programs/benviron/water/withdraw/pdf/stremdpl.pdf>.

**Pollutant:** Rhode Island water pollution laws defines pollutant as any material or effluent which may alter the chemical, physical, biological, or radiological characteristics and/or integrity of water, including, but not limited to, dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, cellar dirt or industrial, municipal, agricultural, or other waste petroleum or petroleum products, including but not limited to oil. R.I. Gen. Laws § 46-12-1(15) (2011).

**Pollution:** Rhode Island water pollution laws define pollution as the manmade or man induced alteration of the chemical, physical, biological, and radiological integrity of water. R.I. Gen. Laws § 46-12-1(17) (2011).

**Qualified Hydroelectric Facility:** For Federal Hydroelectric Production Incentives these include a turbine or other generating device owned or solely operated by a non-Federal entity which generates hydroelectric energy for sale and which is added to an existing dam or conduit. 42 U.S.C.S. § 15881 (2011).

**Repair:** Any work performed at a dam that may affect the integrity of the dam, including certain cutting or removal of trees where the resulting decomposition of the tree root system could jeopardize the integrity of the dam, work requiring excavation into the embankment fill or foundation of a dam, work requiring reinforcement of the embankment or work requiring removal or replacement of major structural components of a dam; or any related, new, temporary or permanent access way(s) that may be required within freshwater wetlands. Dep't of Env'tl. Mgmt., Rules and Regulations for Dam Safety 6 (2007) *available at:*  
<http://www.dem.ri.gov/pubs/regs/regs/compinsp/dams07.pdf>.

**RES Renewable Energy Resources:** Direct solar radiation; the wind; movement or the latent heat of the ocean; the heat of the earth; small hydro facilities; biomass facilities using eligible biomass fuels and maintaining compliance with current air permits, eligible biomass fuels may be co-fired with fossil fuels, provided that only the renewable energy fraction of production from multi-fuel facilities shall be considered eligible; fuel cells using the renewable resources. R.I. Gen. Laws § 39-26-5 (2011).

**RES Small Hydro Facility:** A facility employing one or more hydroelectric turbine generators and with an aggregate capacity not exceeding thirty (30) megawatts. R.I. Gen. Laws § 39-26-2 (2011).

**Reservoir:** A body of water that is impounded or diverted by a dam. Dep't of Env'tl. Mgmt., Rules and Regulations for Dam Safety 6 (2007) *available at:*  
<http://www.dem.ri.gov/pubs/regs/regs/compinsp/dams07.pdf>.

**Significant Hazard Dam:** A dam where failure or misoperation results in no probable loss of human life but can cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare. Dep't of Env'tl.

Mgmt., Rules and Regulations for Dam Safety 6 (2007) *available at:*  
<http://www.dem.ri.gov/pubs/regs/regs/compinsp/dams07.pdf>.

**Small Conduit Hydroelectric Facility:** An existing or proposed hydroelectric facility that is constructed, operated, or maintained for the generation of electric power, and includes all structures, fixtures, equipment, and lands used and useful in the operation or maintenance of the hydroelectric facility, but excludes the conduit on which the hydroelectric facility is located or the transmission lines associated with the hydroelectric facility. 18 C.F.R. 4.30(a)(28) (2011).

**Small Hydroelectric Power Production Facility:** Any hydroelectric power project which is located in this state, which uses the water power potential of an existing dam, and which has not more than fifteen thousand (15,000) kilowatts of installed capacity. R.I. Gen. Laws § 44-30-21(4) (2011).

**Small Hydroelectric Power Project:** Any hydroelectric power project which is located at the site of any existing dam, which uses the water power potential of such dam, and which has not more than 30,000 kilowatts of installed capacity. 16 USCS § 2708 (2011).

**Visual inspection:** A visual, technical evaluation of the physical conditions of a dam that affect performance of the structure. Dep't of Env'tl. Mgmt., Rules and Regulations for Dam Safety 6 (2007) *available at:*  
<http://www.dem.ri.gov/pubs/regs/regs/compinsp/dams07.pdf>.

## **APPENDIX B: Abbreviations**

AEP: Massachusetts Alternative Energy Portfolio

APA: Administrative Procedure Act

B.L. DMD: Boone Lake Dam Management District

CEPA: Connecticut Environmental Protection Agency

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act

CRMC: Rhode Island Coastal Resources Management Council

CWA: Clean Water Act

DCR: Massachusetts Department of Conservation and Recreation

DEM: Rhode Island Department of Environmental Management

DER: Massachusetts Department of Energy Resources

DHAC: Division of Hydropower Administration and Compliance

DMD: Dam Management Districts

DSP: Rhode Island Department of Environmental Management Dam Safety program

DSSMP: Dam Safety Surveillance and Monitoring Plan Outlines

DSSMR: Dam Safety Surveillance and Monitoring Reports

DWSP: Massachusetts Division of Water Supply Protection

EA: Environmental Assessment

EAP: Emergency Action Plan

EIS: Environmental Impact Statement

EMA: Rhode Island Emergency Management Agency

EPA: Environmental Protection Agency

ESA: Endangered Species Act

FERC: Federal Energy Regulatory Commission

FWPCA: Federal Water Pollution Control Act

FPA: Federal Power Act

LIHI: Low Impact Hydropower Institute

MA. DEM: Massachusetts Department of Environmental Management

NCP: National Contingency Plan

NDIA: National Dam Inspection Act

NEPA: National Environmental Protection Act  
NOI: Notice of Intent to File a License  
NPL: National Priorities List  
P. DMD: Pascoag Reservoir/Eco Lake Dam Management District  
PA/SI: Preliminary Assessment/Site Inspection  
RD/RA: Remedial Design/Remedial Action  
REA: Ready for Environmental Assessment  
REP: Connecticut's Renewable Energy Portfolio  
RES: Renewable Energy Standard  
RHA: Rivers and Harbors Act  
ROD: Record of Decision  
RI/FS: Remedial Investigation and Feasibility Study  
SAMP: Special Area Management Plans  
SDM: Rhode Island Stream Flow Depletion Methodology  
The Corps: The Army Corp of Engineers  
WPCA: Rhode Island Water Pollution Control Act  
WSPT: Massachusetts Water Supply Protection Trust