

119 FERC ¶ 61,170
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Joseph T. Kelliher, Chairman;
Sudeen G. Kelly, Marc Spitzer,
Philip D. Moeller, and Jon Wellinghoff.

Public Service Company of New Hampshire

Project No. 1893-042

ORDER ISSUING NEW LICENSE

(Issued May 18, 2007)

Introduction

1. On December 30, 2003, Public Service Company of New Hampshire (PSNH) filed an application for a new major license pursuant to sections 4(e) and 15 of the Federal Power Act (FPA),¹ for the continued operation and maintenance of the 29.9-megawatt (MW) Merrimack River Project No. 1893. The project is located on the Merrimack River² in Merrimack and Hillsborough Counties, New Hampshire, and does not occupy any federal land. As discussed below, we are issuing a new license for the project.

Background

2. The Commission issued the original license for the Merrimack River Project on May 8, 1980, with a term expiring on December 31, 2005.³ Since expiration of

¹ 16 U.S.C. §§ 797(e) and 808 (2000).

² The Merrimack River is a navigable waterway of the United States, 4 FPC 631 (1944).

³ 11 FERC ¶ 62,907 (1980).

the license, PSNH has operated the project under an annual license pending the disposition of its new license application.

3. Notice of the application was published in the Federal Register on January 7, 2004.⁴ Timely motions to intervene were filed by Upper Merrimack Local Advisory Committee, Town of Hooksett, City of Concord, Manchester Water Works, U.S. Department of the Interior (Interior), Boott Hydropower, Concerned Citizens of Bow (Concerned Citizens), the New Hampshire Public Utilities Commission, and jointly by Appalachian Mountain Club (Mountain Club), American Whitewater, and New England FLOW. Late motions to intervene were filed by the New Hampshire Department of Environmental Services (New Hampshire DES), New Hampshire Department of Fish and Game (New Hampshire Fish and Game), the U.S. Environmental Protection Agency (EPA), New Hampshire Rivers Council (Rivers Council), and Greater Concord Chamber of Commerce.⁵

4. On March 17, 2005, the Commission issued public notice that the project was ready for environmental analysis and solicited comments, recommendations, terms and conditions, and prescriptions. In response, comments, recommended terms and conditions, and prescriptions were filed by Interior, Concerned Citizens, the EPA, and jointly by the Mountain Club, American Whitewater, New England FLOW, and the Rivers Council (Mountain Club *et al.*).

5. On January 24, 2006, the Commission staff issued an Environmental Assessment (EA) that evaluated the potential impacts of relicensing the Merrimack River Project. Mr. Bruce Silva, the Advisory Council on Historic Preservation, New Hampshire DES, EPA, PSNH, U.S. Fish and Wildlife Service (FWS), Concerned Citizens, and Mountain Club *et al.* filed comments on the EA.

6. The motions to intervene, comments, and recommendations have been fully considered in determining whether, and under what conditions, to issue this license.

⁴ 69 Fed. Reg. 2,349 (Jan. 15, 2004).

⁵ The motions for late intervention were granted on August 18, 2005. All timely, unopposed interventions were granted automatically, pursuant to 18 C.F.R. § 385.214(c)(1) (2006).

Project Description

7. The Merrimack River Project consists of three developments located along 21 miles of the Merrimack River. The project's developments from downstream to upstream are Amoskeag, Hooksett, and Garvins Falls. All three developments are located in developed areas within the towns of Bow, Pembroke, Allenstown, and Hooksett and the cities of Manchester and Concord, New Hampshire.
8. As currently licensed, the Amoskeag development consists of a 29-foot-high, 710-foot-long concrete gravity dam comprised of a low crest section with 5-foot-high flashboards and a high crest section with 3-foot-high flashboards. The dam impounds a 7-mile-long, 478-acre reservoir. The bypassed reach is approximately 2,000 feet long. The powerhouse contains three generating units with a total installed capacity of 16 MW. Fish passage facilities at the development include a pool and weir type fish ladder at the powerhouse, with an eel trap and a downstream fish passage system at the waste gate. The development also includes a 415-foot-long, 34.5-kilovolt (kV) transmission line.
9. The Hooksett development consists of a 14-foot-high dam comprised of a 340-foot-long stone masonry section with 2-foot-high flashboards connected to a 250-foot-long concrete section with 2-foot-high flashboards, and a 15-foot-by-20-foot Taintor gate. The dam impounds a 5.5-mile-long, 405-acre reservoir. The bypassed reach is about 300 feet long. The powerhouse contains a single generating unit with an installed capacity of 1.6 MW. Fish passage facilities at the development include a downstream fish bypass system between the Taintor gate and the powerhouse.
10. The Garvins Falls development consists of an 18-foot-high, 550-foot-long concrete and granite gravity dam comprised of a low crest section with 3-foot-high flashboards and a high crest section with 1.2-foot-high flashboards. The dam impounds an 8-mile-long, 640-acre reservoir. The bypassed reach is about 650 feet long. The development also includes: a 500-foot-long power canal with a 10-foot-wide waste gate; two powerhouses, each containing two generating units for a total installed capacity of 12.3 MW; and a louver-type fish guidance and downstream bypass system in the canal. The current license also identifies a 340-foot-long, 34.5-kV transmission line.
11. The flashboards at all three developments are designed to fail under high flow conditions.
12. As currently licensed, there are no minimum flow requirements for the bypassed reaches of the three developments. Rather, the reaches have leakage

flows, except during periods of high flow (typically in spring) when flows in excess of the developments' hydraulic capacity are spilled. There are however minimum flow requirements for the tailwaters of each development. The licensee must release the lesser of: 719 cubic feet per second (cfs) or inflow at Garvins Falls; 819 cfs or inflow at Hooksett; and 833 cfs or inflow at Amoskeag.

13. There is no mode-of-operation requirement in the current license. However, PSNH operates the Hooksett development in a run-of-river mode and operates Amoskeag and Garvins Falls in either a daily peaking or run-of-river mode, depending upon flow conditions.

14. Project recreation facilities include: the Amoskeag Fishways Learning and Visitors Center (an environmental education center that provides exhibits about the river and the project's fish ladder at Amoskeag dam), the portage facilities at the Amoskeag and Hooksett developments, and an overlook at Amoskeag. In addition to the facilities managed by the licensee, there are twelve other recreation sites providing public access to project waters.⁶

15. On relicensing, PSNH proposes the following measures: (1) operate all three developments run of river; (2) provide minimum flows to the bypassed reaches;⁷ (3) prepare an operations plan for compliance with the run-of-river and minimum flow requirements; (4) provide minimum flows to the project's tailraces until run-of-river operations are implemented, and thereafter whenever run-of-river operations are interrupted; (5) create a conservation easement along the riverfront adjacent to the Garvins Falls development; (6) develop a final upstream and downstream fish passage plan in consultation with the agencies; (7) develop a Shoreline Management Plan (SMP); (8) develop a recreation plan; and (9) participate in a Programmatic Agreement and develop an Historic Properties Management Plan.

Project Facilities And Boundary

16. The project must include all project structures and facilities, including the project's dams, powerhouses, reservoirs, canals, transmission facilities, and recreation facilities. The project boundary must incorporate all lands occupied by these structures and facilities, as well as all lands that serve a project purpose.

⁶ EA at 54-55.

⁷ As discussed in more detail below, one of the proposed minimum flows will require modifications to Amoskeag Dam's eastern spillway.

17. Except for the areas around the dams and powerhouses and a parcel of land downstream of the Garvins Falls dam, the current project boundary for the most part is comprised of contour lines that follow the reservoirs' shoreline: at Amoskeag, it is at 175.0 feet mean sea level (msl); at Hooksett, it is 189.0 feet msl; and at Garvins Falls, it is at 219.8 feet msl.⁸ Because the project boundary with rare exception hugs the shoreline, there are almost no project lands or buffer zones around the reservoirs.

18. PSNH's proposed Exhibit G (project boundary) maps for relicensing⁹ differ from the currently approved project boundary maps in several respects.¹⁰ The applicant, however, provides no explanation for the differences between the approved and proposed maps. This order does not approve the changes, and we will instead require PSNH to file revised maps that include the lands and waters in question. If in the future PSNH wishes to pursue removal of these areas from the project, it may file an amendment application, which must contain support for its request.

19. It also appears that at Garvins Falls there is a discrepancy between the project boundary and the reservoir's elevation. The reservoir elevation at Garvin Falls (with flashboards) is 219.85 feet msl, but the stated project boundary around the impoundment is only 219.8 feet. If this is the case, there would be a 0.05-foot-wide band around the impoundment that is flooded but not within the project boundary. PSNH's revised boundary maps should include all lands flooded by the Garvins Falls impoundment.

⁸ The reservoir elevations (with flashboards) are: 175.0 feet mean sea level (msl) at Amoskeag; 189.0 feet msl at Hooksett; and 219.85 feet msl at Garvins Falls.

⁹ See June 4, 2004 filing of PSNH.

¹⁰ The approved Exhibit G map for the Amoskeag development shows a portion of Martins Brook, up to the point where it crosses Martin's Ferry Road, within the project boundary. The corresponding proposed Exhibit G in the relicense application does not show any part of the brook within the project boundary. In addition, the approved project boundary map for the Garvin Falls development shows two side channel ponds, one named Sugar Ball Pond, the other unnamed, within the project boundary. The corresponding proposed Exhibit G in the relicense application shows both ponds but the proposed boundary lines cut across the mouth of both ponds, excluding them from the boundary.

20. Finally, we note that the project's recreation and transmission facilities are not enclosed within the project boundary. With respect to recreation facilities, the Amoskeag Fishways Learning and Visitors Center, a scenic overlook at Amoskeag dam, and the portage facilities at Amoskeag and Hooksett are not shown as being enclosed within the proposed project boundary.

21. As for the project's transmission facilities, although the current license includes primary transmission lines at the Amoskeag and Garvins Falls developments, PSNH's relicense application states that the project has no primary transmission lines. PSNH filed additional information on January 3, 2005, which included descriptions of the electrical connections and components for each of the Merrimack River Project's three developments. The descriptions document that the lines identified in the current license are not primary transmission lines, i.e., they do not carry the project's power to the interconnected transmission grid. Rather, they each transmit project power to adjacent substations where transformers increase the voltage and interconnection into the local power grid is made. The three substations are therefore project features that must be included within the license.¹¹ A comparison of the electrical descriptions with the proposed Exhibit G drawings shows that the substations at the Amoskeag and Hooksett developments have not been included within the project boundaries.

22. On a related issue, there is a stone masonry wall, about 5 to 6 feet high, that extends from the western end of the spillway downstream, serving to separate the powerhouse tailrace from the main spillway channel. Although clearly within the project boundary and shown on the Exhibit F and G drawings, it is not identified in the drawings, and there is no reference to it in the license application. However, this training wall appears to serve a project purpose by preventing spillage water from scouring the tailrace, and it therefore is a project facility that must be included in the license.

23. We are including Article 203 in the license to require PSNH to file revised Exhibit G drawings that enclose within the project boundary all project facilities and lands, including those described above. In addition, Article 204 requires PSNH to file Exhibit F (general design) drawings of the substations and other transmission facilities.

¹¹ The lines are appurtenant project facilities and thus must remain under license.

Water Quality Certification

24. Under section 401(a)(1) of the Clean Water Act (CWA),¹² the Commission may not issue a license authorizing the construction or operation of a hydroelectric project unless the state water quality certifying agency either has issued water quality certification for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed one year. Section 401(d) of the CWA provides that the state certification shall become a condition of any federal license that authorizes construction or operation of the project.¹³

25. PSNH applied to the New Hampshire DES for certification on December 16, 2003. The New Hampshire DES received the request on December 17, 2003, and issued a certification on December 16, 2004. PSNH appealed certain conditions and the New Hampshire DES issued a modified certification on May 10, 2005. The modified certification contains eleven conditions attached as Appendix A to this order and incorporated as conditions of the license by Ordering Paragraph (D).¹⁴

26. The conditions require that the licensee: (1) post the certification in the project powerhouses; (2) allow New Hampshire DES to inspect the project at any time; (3) participate in a total maximum daily load study; (4) provide minimum flows in project tailwaters until run-of-river operation is implemented; (5) provide minimum flows in the bypassed reaches; (6) evaluate the ability of the developments to maintain constant water surface elevations; (7) operate the project in a run-of-river mode and develop an operations plan; (8) enhance upstream and downstream fish passage; and (9) operate the project consistent with New Hampshire surface water quality standards. Condition (10) reserves the authority of New Hampshire DES to amend and add additional terms of its certification after notice and opportunity for hearing, and Condition (11) allows the New Hampshire DES to request reopening of the license to consider modifications of the license to ensure compliance with surface water quality standards.

¹² 33 U.S.C. § 1341(a)(1) (2000).

¹³ 33 U.S.C. § 1341(d) (2000).

¹⁴ We recognize that some of the dates in the certification have passed, and we assume that New Hampshire DES will adjust those dates as necessary.

27. Condition 7 of the certification requires PSNH to prepare an operations plan for New Hampshire DES approval. Article 405 of the license requires PSNH to file the plan for Commission approval.

28. The minimum flows in the Amoskeag bypassed reach will be released from two locations. On the western end of the spillway, flows will be released from an existing fish bypass gate. However, in order to release flows from the eastern spillway, the licensee will have to modify the flashboards and spillway to provide for a release structure. Certification Conditions E-7(a)(iii) and (b) require PSNH to include in its operations plan the proposed design and location of the release structure, in consultation with New Hampshire DES, New Hampshire Fish and Game, FWS, and EPA. Such a structure will ensure compliance with the minimum flow requirements for the eastern spillway at Amoskeag. For the release structure, Articles 301-303 require PSNH to file construction plans, drawings, and as-built exhibits for Commission approval

Coastal Zone Management Act

29. Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA),¹⁵ the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification.

30. By letter dated January 4, 2005, the Massachusetts Office of Coastal Zone Management concurred with PSNH's finding that the Merrimack River Project has no reasonably foreseeable effects on the land and water resources of the Massachusetts coastal zone.

Section 18 Fishway Prescriptions

31. Section 18 of the FPA¹⁶ provides that the Commission shall require the construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate. As pertinent here, section 241 of the Energy Policy Act of 2005

¹⁵ 16 U.S.C. § 1456(3)(A) (2000).

¹⁶ 16 U.S.C. § 811 (2000).

(EPA¹⁷) amended section 18 and added a new section 33 to the FPA¹⁸ that applies to preliminary section 18 prescriptions issued by the Departments of the Interior or Commerce (Departments) in Commission license proceedings. Under new regulations developed by the Departments to implement section 241 of EPA¹⁷, any party to a Commission license proceeding may: (1) request a trial-type hearing on “disputed issues of material fact;” and (2) propose alternative conditions or prescriptions that the Departments must accept unless inconsistent with certain energy and environmental criteria.¹⁹

32. The anadromous fishery in the Merrimack River includes American shad, alewife, blueback herring, rainbow smelt, and Atlantic salmon. American eel, a catadromous species, also occurs in the project area.²⁰ Currently, the project has an upstream fish ladder at Amoskeag and downstream fishways at all three developments. For the past twenty years, fish passage at the project has been provided according to a 1986 Comprehensive Plan for the Provision of Anadromous Fish Passage Measures and Facilities at PSNH's Merrimack-Pemigewasset River Hydroelectric Dams (1986 Agreement). Under the 1986 Agreement, PSNH has over the years tested the effectiveness of the project's fishways, but those tests using shad, alewife, and herring were inconclusive due in part to the low numbers of fish present. The 1986 Agreement also provides that, in the event passage targets at Amoskeag reach specified thresholds, PSNH will construct and test new upstream fishways at Hooksett and Garvins Falls.

33. The status of American eels is unknown in the project area, the numbers of river herring and American shad reaching the project in recent years are well-documented and very low, and Atlantic salmon are all but non-existent in the Merrimack River. Therefore, the EA recommended updating the 1986 Agreement to include American eels because eels were not a species of concern in 1986 and waiting until fish populations increase before conducting effectiveness studies of existing fishways, because the results of the studies would be more meaningful with wild, naturally-occurring fish. The EA concluded that these actions, coupled with a reservation of the Commission's authority to prescribe fishways as may be required

¹⁷ Pub. L. 109-58, 119 Stat. 595 (2005).

¹⁸ 16 U.S.C. § 823d (2000).

¹⁹ See 70 Fed. Reg. 69,804 (November 17, 2005).

²⁰ Catadromous fish live in fresh water and spawn in salt water.

by Interior in the future would adequately address fish passage needs at the project.²¹

34. On May 16, 2005, Interior filed its preliminary section 18 prescriptions. The preliminary prescriptions required upstream fishways at Hooksett and Garvins Falls (for shad and herring) to be constructed in response to lower trigger numbers than those in the 1986 Agreement and sooner after the trigger numbers are reached. Interior's preliminary prescription also required an upstream eelway at Hooksett and possibly at Garvins Falls, in addition to more effectiveness testing of all fishways, current and future.

35. On December 19, 2005, PSNH filed alternative section 18 prescriptions that requested changes in the scope and timing of several of Interior's prescriptions. PSNH also requested a trial-type hearing. Pursuant to Interior's regulations, the agency reviewed and analyzed PSNH's proposed alternatives.

36. By letter dated July 20, 2006, Interior referred PSNH's hearing request to its Hearings Division of the Office of Hearings and Appeals. On December 26, 2006, Interior filed its modified prescriptions with the Commission, including a reservation of its authority to require fishways it may prescribe in the future.²² The final prescriptions (Appendix B of this order) retain the lower trigger numbers and shorter schedule for installing upstream fishways at Hooksett and Garvins Falls once the trigger numbers are met and also require installation of interim and permanent eelways at all three developments.

37. While these modified prescriptions are potentially less expensive than the preliminary prescriptions,²³ they do not change the requirement for effectiveness

²¹ EA at 38-39.

²² On February 6, 2007, PSNH filed a fishway prescription settlement agreement with the Commission for informational purposes only. The agreement, signed by FWS, PSNH, and American Whitewater, resolved all issues raised by the FWS preliminary prescriptions for fishways and by PSNH's alternative prescriptions and request for trial type hearing.

²³ In the event that trigger numbers are met and upstream fishways are installed at Hooksett and Garvins Falls, the final prescriptions would require a Denil fishway instead of a rock ramp fishway at Hooksett and would allow PSNH to study the possibility of a single fishway (rather than the two fishways required by the preliminary prescription) at Garvins Falls.

studies, and we agree with Commission staff that these studies should be delayed until the number of naturally-occurring fish in the river increases. Nevertheless, because of the mandatory nature of section 18 prescriptions, Ordering Paragraph (E) requires implementation of Interior's section 18 prescriptions. Article 406 of the license reserves the Commission's authority to require fishways, as may be prescribed by Interior in the future.

Threatened And Endangered Species

38. Section 7(a)(2) of the Endangered Species Act of 1973 (ESA),²⁴ requires federal agencies to ensure their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of designated critical habitat.

39. The federally threatened bald eagle is present at the project and uses project lands and waters for perching, foraging, and winter roosting.²⁵ No known nesting areas have been documented within the project boundary.²⁶ The EA concluded that relicensing the project with the staff-recommended measures, which include protecting identified bald eagle habitat on PSNH-owned lands within 200 feet of the

²⁴ 16 U.S.C. § 1536(a)(2) (2000).

²⁵ In addition to the bald eagle, FWS noted that the New England cottontail and American eel are under review for listing as threatened or endangered species under the ESA and encouraged the Commission to require measures to protect and enhance New England cottontail habitat and to avoid impacts to the American eel. Subsequently, in September 2006 and February 2007 notices, FWS concluded that listing of the New England cottontail and the American eel is not warranted. *See Endangered and Threatened Wildlife and Plants--Proposed Critical Habitat Designations*, 70 Fed. Reg. 53,755 (Sept. 12, 2006); and *Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List the American Eel as Threatened or Endangered*, 72 Fed. Reg. 4,967 (Feb. 2, 2007).

²⁶ Types of bald eagle habitat identified at the project include: large blocks of undeveloped land along the river that include potential eagle perch sites, known perching and foraging, known and potential night roosting, and potential nesting. One-third to one-half of the project's shoreline contains known or potential perching and foraging; roosting and potential nesting habitat are less common along this reach.

project shoreline would not be likely to adversely affect the bald eagle.²⁷ As discussed below in this order, we are requiring that five areas of bald eagle habitat, in addition to PSNH's proposed area at the Garvins Falls development, be included in the project and protected under the licensee's proposed shoreline management plan. The Garvins Falls area would be a 200-foot-wide buffer extending along about 2.9 miles of shoreline. The other areas are of varying sizes, but they also would include lands extending up to 200 feet from the shoreline.

40. By letter dated January 24, 2006, staff requested concurrence from the FWS with its "not likely to adversely affect" finding. In its response filed February 23, 2006, FWS declined to concur and noted that it typically considers riparian buffers less than 100 meters (328 feet) wide to be inadequate to protect important eagle foraging areas and recommended that PSNH establish a 100-meter-wide buffer for the Garvins Falls parcel instead of the proposed 200-foot-wide buffer.

41. In a clarification letter to FWS on April 21, 2006, staff stated that it was unclear from the FWS filing why a 200-foot-wide buffer was insufficient, and reiterated that, when compared to existing conditions, staff's recommended habitat protection measures, including the bald eagle habitat areas to be brought into the project, run-of-river operation, and minimum flows in the project's bypassed reaches, would benefit bald eagles.

42. In its letter filed May 31, 2006, FWS concurred with staff's determination that issuing a new license for the Merrimack Project under the Commission's recommended alternative is not likely to adversely affect the bald eagle. FWS, however, reemphasized that a 100-meter buffer at Garvins Falls would be the minimum width for adequate long-term protection of bald eagle habitat, and cited

²⁷ A project boundary encloses only those lands that are necessary for project purposes. Generally, boundaries should be no more than 200 feet (measured horizontally) from the reservoir's shoreline, except where, among other things, additional lands are necessary for project purposes, such as public recreation, shoreline control, or protection of environmental resources. 18 C.F.R. § 4.41(g)(2)(i)(B) (2006).

five references to provide evidence of the desirability of a larger buffer zone for the protection of eagles.²⁸

43. The literature cited by FWS indicates that buffer zone recommendations for protection of bald eagle habitat from human disturbance specify widths of from 100 to 1320 meters (328 to 4330 feet), depending on the type of habitat to be protected. It also recognizes that buffer zones determinations are site-specific, based on the type of eagle use in the area and the sensitivity of the eagles to human activity.²⁹ FWS has not, however, demonstrated that the facts in this case warrant a buffer zone at the Garvins Falls tract that is more than 200 feet wide.³⁰

44. While we acknowledge that eagles may be disturbed by human activity, only a small portion of the habitat at Garvins Falls has been identified as specific perching and foraging habitat,³¹ which is fairly common at the project. Thus, any disturbed perching or foraging bald eagles would be able to relocate to comparable foraging areas at the project. We also note that eagles prefer perch trees less than 50

²⁸ David A. Buehler, Timothy J. Mersmann, James D. Fraser, Janis K. D. Seegar, *Effects of Human Activity on Bald Eagle Distribution on the Northern Chesapeake Bay*, 55 J. Wildlife Mgmt. No. 2, at 282-290 (1991); (2) Teryl G. Grubb and Rudy M. King, *Assessing Human Disturbance of Breeding Bald Eagles with Classification Tree Models*, 55 J. Wildlife Mgmt. No. 3, at 500-511 (1991); (3) Mark V. Stalmaster and James R. Newman, *Behavioral Responses of Wintering Bald Eagles to Human Activity*, 42 J. Wildlife Mgmt. No. 3, at 506-513 (1978); (4) Endangered Species Office, FWS (Twin Cities, MN), *Northern States Bald Eagle Recovery Plan* (1983); and (5) Washington Department of Fish and Wildlife, *Priority Habitat and Species Management Recommendations*, Volume IV at pp. (9-1)-(9-15) (2004).

²⁹ See Stalmaster and Newman article; Washington Department of Fish and Wildlife literature, *supra* n. 28.

³⁰ See *FPL Energy Maine Hydro LLC*, 88 FERC ¶ 61,116 at 61,273-74 (1999).

³¹ The Garvins Falls area contains approximately 53 acres of an “undeveloped habitat block of potential importance,” approximately 13 acres of known perching and foraging, and approximately 4 acres that are not identified as eagle habitat.

meters from the shoreline,³² and although a 100-meter-wide buffer would offer additional protection from outside development, the 200-foot-wide buffer required in this license will protect valuable perch trees and offer some protection from the effects of human activity on perching and foraging eagles. The licensee will manage eagle habitat pursuant to the shoreline management plan (SMP) required by Article 407 of the license. If eagle use dictates in the future that additional protection is needed, the monitoring provision of the SMP allows for increasing the buffer width.

Recommendations Of Federal And State Fish And Wildlife Agencies

A. Recommendations Pursuant to Section 10(j) of the FPA

45. Section 10(j)(1) of the FPA³³ requires the Commission, when issuing a license, to include conditions based on recommendations by federal and state fish and wildlife agencies submitted pursuant to the Fish and Wildlife Coordination Act,³⁴ to “adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)” affected by the project.

46. If the Commission believes that a section 10(j) recommendation may be inconsistent with the purposes and requirements of Part I of the FPA or other applicable law, section 10(j)(2)³⁵ requires the Commission and the agencies to attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agencies. If the Commission still does not adopt a recommendation, it must explain how the recommendation is inconsistent with Part I of the FPA or other applicable law, and how the conditions imposed by the Commission adequately and equitably protect, mitigate damages to, and enhance fish and wildlife resources.

³² See Washington Department of Fish and Wildlife literature, *supra* n. 28

³³ 16 U.S.C. § 803(j)(1) (2000).

³⁴ 16 U.S.C. § 661, *et seq.* (2000).

³⁵ 16 U.S.C. §803(j)(2) (2000).

47. In response to the March 17, 2005 public notice that the project was ready for environmental analysis, Interior filed nineteen recommendations.³⁶ Three recommendations were determined to be outside the scope of section 10(j) and are discussed in the next section. This license includes conditions consistent with fifteen of the remaining sixteen recommendations that are within the scope of section 10(j). These include recommendations for: run-of-river operation (Appendix A, water quality certification conditions); ramping rates at Amoskeag and Hooksett developments (Article 403); minimum tailrace flows during impoundment refilling periods (Article 404); restrictions on whitewater boating releases at Amoskeag (Article 408); operation monitoring at each development (Appendix A and Article 405); and minimum flows to bypassed reaches at Hooksett, Garvins Falls, and Amoskeag (Appendix A and Article 402).³⁷

48. The remaining recommendation, for flow ramping rates at Garvins Falls, we do not adopt, as discussed below.

³⁶ Interior filed its recommendations on May 16, 2005. The recommendations included six at Amoskeag, five at Hooksett, five at Garvin Falls, and three addressing shoreline and land protection.

³⁷ Initially, staff had made preliminary determinations that the ramping rates for Amoskeag and Hooksett and the minimum flows for the Amoskeag bypassed reach were inconsistent with the purposes and requirements of Part I of the FPA or other applicable law, but the inconsistencies were subsequently resolved.

With respect to the Amoskeag bypassed reach flows, Interior originally recommended year-round minimum flows in the Amoskeag bypassed reach of 410 cfs from the eastern spillway and 149 cfs from the fish bypass gate on the western spillway. In the EA, Commission staff recommended 280 cfs year-round from the eastern spillway and 149 cfs from the western spillway during the fish passage seasons (April 1 through June 30, and September 15 through October 31). Staff provided an analysis to support the 280-cfs minimum flow from the eastern spillway and modified its recommendation for flows from the western spillway to also provide a minimum flow of 58 cfs during the non-fish passage seasons (i.e., July 1 through September 14, and November 1 through March 31). During the 10(j) meeting, Interior indicated such a flow scenario might be acceptable. *See* May 19, 2006 summary of the section 10(j) teleconference. Interior did not respond to the teleconference summary. Therefore, staff assumed, and we agree, that the issue of minimum flows in the Amoskeag bypassed reach is resolved.

49. Although the project will operate in a run-of-river mode under the new license, there are times when the project will deviate from this mode of operation (for example, after flashboard failure or when a reservoir is drawn down for maintenance). Ramping rates will ensure that the transition between non-run-of-river and run-of-river operation has a minimal effect on aquatic resources below the project.³⁸

50. Interior recommended a ramping rate of 1,214-cfs change per hour at Garvins Falls, while the EA recommended adopting PSNH's proposed rate of 1,377 cfs change per hour.³⁹ Commission staff made an initial determination that Interior's recommended flow ramping rate for Garvins Falls may be inconsistent with the comprehensive planning standard of section 10(a)(1) and the public interest standard of section 4(e) of the FPA. By letter dated January 24, 2006, Commission staff advised Interior of its preliminary determination and attempted to resolve the apparent inconsistency. Interior responded by letter dated February 23, 2006. A teleconference was held on April 4, 2006. As staff stated in the EA and during the 10(j) teleconference, this difference in ramping rates is probably biologically insignificant,⁴⁰ but the inconsistency could not be resolved because there were questions about that development's turbine capacity and operational characteristics that PSNH was unable to answer during the call.

51. On June 30, 2006, PSNH filed data on Garvins Falls' turbine capacity and operational characteristics.⁴¹ PSNH also noted that, although the turbines can be operated at lower flow releases, doing so reduces efficiency and creates more wear on the turbines. Interior did not provide any further comments on this issue following PSNH's June 30, 2006 filing, and we find nothing in the filing to warrant a different ramping rate. Therefore, Article 403 requires a ramping rate of 1,377 cfs at Garvins Falls. This ramping rate should be adequate to protect aquatic resources

³⁸ Ramping rates result in a relatively smooth, rather than abrupt, change in flows. In this case, the ramping rates would be implemented when the project is returning to run-of-river operations following some period of non-run-of-river operation (*e.g.*, flashboard failure, maintenance).

³⁹ EA at 30-31.

⁴⁰ *Id.*

⁴¹ Two of the Garvins Falls turbines have hydraulic capacities of 1,670 cfs, one has a capacity of 1,120 cfs, and the fourth unit has a capacity of 1,490 cfs.

below the development and would give PSNH some flexibility in determining which turbines to operate while restoring run-of-river conditions.

52. For the above reasons, we conclude, in accordance with FPA section 10(j)(2)(A), that Interior's recommended ramping rate at Garvins Falls is inconsistent with the comprehensive planning standard of sections 4(e) and 10(a) of the FPA. In accordance with section 10(j)(2)(B) of the FPA, we find that the measures required by this license will adequately and equitably protect, mitigate damages to, and enhance fish and wildlife resources affected by this project

B. Recommendations Pursuant to Section 10(a)(1) of the FPA

53. Section 10(a)(1)⁴² requires that any project for which the Commission issues a license shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce; for the improvement and utilization of waterpower development; for the adequate protection, mitigation, and enhancement of fish and wildlife; and for other beneficial public uses, including irrigation, flood control, water supply, recreation, and other purposes.

1. Shoreline Management Plan and Buffer Zones

54. As previously indicated, three of Interior's section 10(j) recommendations for a shoreline management plan, conservation restrictions for the Garvins Falls tract, and conservation restrictions and protection for PSNH riparian land upstream of Hooksett do not qualify for section 10(j) status because they are not specific fish and wildlife recommendations. We, therefore, consider them under the broad public interest standard of section 10(a)(1).

55. As noted, except for the areas around the project dams and another area downstream of Garvins Falls dam and along the Soucook River, the current project boundary only extends to the normal high water mark at the shoreline of each of the project's impoundments. As a result, there is virtually no buffer between project waters and adjacent lands.

56. Land use in the project area varies. About 22 percent of the land within a quarter mile of the shoreline of the Garvins Falls impoundment is currently protected by conservation easements, public parks, and state and municipal

⁴² 16 U.S.C. § 803 (a)(1) (2000).

ownership. Most of the undeveloped land along the Garvins Falls impoundment is along its eastern side as portions of the western side are bordered by the City of Concord. Land adjacent to Hooksett and Amoskeag is generally more developed than at Garvins Falls and includes large blocks of residential, commercial, and industrial areas. The Amoskeag development is partially surrounded by the City of Manchester.

57. As noted, the bald eagle is present in the project area. PSNH proposes to develop a shoreline management plan (SMP) for the project and establish a 2.9-mile-long, 200-foot-wide buffer zone on PSNH-owned shoreline property extending from about two miles upstream of the Garvins Falls dam down to the northwestern bank of the Soucook River approximately 0.9 miles downstream of the dam. This buffer area would cover about 70 acres of land on the east side of the river, including the 53 acres of an undeveloped habitat block of potential importance for the bald eagle discussed above. The area downstream of the dam includes approximately 13 acres of known perching and foraging habitat. The remaining approximately four acres, located closest to the Soucook River, is not identified as eagle habitat.⁴³

58. PSNH does not propose to expand the project boundary to include its proposed buffer land at Garvins Falls. Rather, it would grant a conservation easement to the Society for the Protection of New Hampshire Forests or another conservation group to manage the property, which would not be brought under license.⁴⁴

59. The EA concluded that, as the project area becomes more developed, the riparian zone could be affected by habitat fragmentation and other impacts of human activity, and therefore recommended inclusion of some shoreline lands within the project boundary to protect riparian wildlife and aquatic resources, as well as recreation and public access.⁴⁵ Therefore, the EA recommended adoption of PSNH's proposal to create a buffer zone at Garvins Falls. Since we conclude that protection of these lands is warranted, we will bring them under license. While

⁴³ Correction to the EA at 51, numbers (4) and (6).

⁴⁴ PSNH also expressed willingness to grant conservation easements for the two islands just below its Amoskeag dam, which were not identified as potential eagle habitat.

⁴⁵ EA at 48-53.

PSNH must retain sufficient rights in the property to ensure that it can carry out its responsibilities under the license, it is free to enter into an agreement with another entity to manage the property on its behalf.

60. The EA also noted that, besides the Garvins Falls tract, there are additional areas of undeveloped eagle habitat along the river and adjacent to the project, and that protecting this habitat within 200 feet of the shoreline would benefit the bald eagle and other wildlife. The EA thus recommended that PSNH establish buffer zones on other PSNH-owned lands within 200 feet of the shoreline that contain identified bald eagle habitat.

61. The EA identified six PSNH-owned parcels,⁴⁶ including the Garvins Falls tract, that contain known bald eagle habitat, about 108 acres total.⁴⁷ The parcels are: (1) approximately two acres of perching and foraging habitat on the east side of the river upstream of the Amoskeag dam; (2) approximately three acres of perching and foraging habitat on the east side of the river upstream of the Hooksett dam;⁴⁸ (3) approximately nine acres of potential roosting habitat on the west side of the river about a mile and a half downstream from the Garvins Falls dam (on an undeveloped portion of a large tract of PSNH land) and just upstream of the coal-fired Merrimack Power Plant in Bow; (4) approximately seventeen acres of perching and foraging habitat on the east side of the river immediately downstream from the Garvins Falls dam;⁴⁹ (5) approximately seven acres of perching and foraging habitat on the west side of the river immediately downstream from the Garvins Falls dam;

⁴⁶ *Id.* at 51. These parcels are identified in License Application, Volume VII, Endangered and Threatened Species Report, figure 2, sheets 1-8.

⁴⁷ On further review of the information, it appears that this total is 88 acres rather than 108 acres.

⁴⁸ For reasons described below, this parcel has since been removed from the list of PSNH-owned lands containing eagle habitat.

⁴⁹ As described above, this order clarifies that there are approximately thirteen acres of perching and foraging habitat and four acres that are not identified as eagle habitat included in this portion of the Garvins Falls tract.

and (6) the approximately 70 acres of an undeveloped habitat block of potential importance upstream from the Garvins Falls dam.⁵⁰

62. The EA further noted that one of the two islands located immediately downstream of the Amoskeag dam is currently within the project boundary, and that this island could therefore be protected through an SMP.

63. In its comments on the EA, PSNH requests that two of the PSNH properties the EA identified as suitable habitat not be designated for protection. According to PSNH, most of the approximately three acres of perching and foraging habitat on the east side of the river upstream of the Hooksett dam belongs to the Town of Hooksett, and the portion that PSNH owns is occupied by structures and an electrical substation. In addition, PSNH notes that the nine acres of potential roosting habitat on the west side of the river downstream from the Garvins Falls dam is an integral part of the coal-fired Merrimack Generating Station and may be needed for Merrimack Generating Station purposes.

64. We agree that the PSNH property upstream from the Hooksett Dam that is occupied by buildings is unlikely to provide eagle habitat, and thus does not warrant protection under the license. However, the bald eagle habitat in the vicinity of PSNH's Merrimack Generating Station has been identified as potential roosting habitat for eagles, which is uncommon in this reach of the Merrimack River, and PSNH has not identified a specific use for this parcel to warrant exclusion from the license. We will therefore require that it be protected under the license. As to the other parcels evaluated in the EA, we agree with staff that these parcels warrant protection under the license. Non-PSNH-owned land with bald eagle habitat is discussed further below.

65. In comments on the EA, Mountain Club *et al.* and FWS argue that the project buffer zone should not be limited to PSNH-owned lands because there are other lands along the project's shoreline that warrant protection. Mountain Club *et al.* recommends cost estimates be prepared for the acquisition of non-PSNH lands for the purposes of a protective buffer.

66. FWS states that, while the EA-recommended buffer would provide important protection for riparian habitat, protection of additional lands that have key habitats is

⁵⁰ As described above, this order clarifies that there are approximately 53 acres of undeveloped habitat of potential importance in this portion of the Garvins Falls tract.

needed. In addition, FWS emphasizes that the buffer zone at Garvins Falls should include not only land at the mouth of the Soucook River,⁵¹ but also PSNH-owned project lands running for a distance along the shoreline of the Soucook River. With respect to the two islands located immediately downstream from the Amoskeag dam, FWS comments that the SMP would help protect the island that lies within the project boundary and recommends that the downstream island be added to the project boundary so that it can also be protected.

67. When considering whether to require additional shoreline protection at a project, we take into account the current level of shoreline development, the likelihood of developmental pressure in the future, the kind and degree of resource protection and enhancement needed, and project economics. In this case, while the project developments do not include large impoundments that attract significant residential or commercial development, the project's proximity to urban areas makes it likely that the shoreline will be subject to developmental pressures in the future such that public access or environmental resources are at risk.

68. Protecting identified bald eagle habitat at the project on licensee-owned land as the EA recommends is a reasonable, cost-effective way to protect a specific shoreline resource while not precluding development in other areas. However, we recognize that there are other parcels of valuable habitat for eagles and other species along the shoreline on land that are not owned by PSNH, and the feasibility of protecting these individual parcels has not been assessed. Therefore, using the shoreline natural resource inventories that have been prepared during relicensing, we are requiring PSNH to submit, as a component of the SMP, a report on the feasibility of protecting the specific tracts of land described below.

69. Roosting habitat is particularly rare along the project stretch of the Merrimack River, and some of this habitat occurs outside of lands currently owned by PSNH. Including a 200-foot-wide buffer along areas identified as known or potential roosting habitat would ensure that bald eagles perching and foraging along the river are able to seek shelter overnight and during inclement weather.

70. Five areas of bald eagle roosting habitat are located on existing conservation lands, as identified in the license application, and therefore are currently protected.⁵²

⁵¹The Soucook River is a tributary of the Merrimack, with its confluence downstream of Garvins Falls.

⁵²Volume VII, Wildlife Resources, Riparian and Floodplain Lands and Riparian Land Protection, figure 2 (sheets 1-8). The lands already covered by
(continued)

Eight other parcels, totaling about 57 acres are identified as potential or known bald eagle roosting habitat, but are not currently protected. PSNH is to study the feasibility of including these lands in the project and protecting them under the SMP.⁵³

71. In addition to the bald eagle habitat, there are 20 New Hampshire Natural Heritage Inventory (Inventory) sites in the project vicinity.⁵⁴ The Inventory is a database of state rare, threatened, and endangered species and exemplary natural communities including those along the Merrimack River channel, banks, floodplains, and bluffs.⁵⁵ Two of these Inventory sites are located within PSNH's proposed Garvins Falls conservation area and thus will be protected under the project SMP. Two other sites are associated with potential eagle roosting habitat and will be assessed concurrently with the additional eagle habitat discussed above. A fifth site, Houghton's umbrella-sedge, is adjacent to the Garvins Falls tract and on PSNH-owned land, and we will require PSNH to expand the buffer zone beyond 200 feet at this site to include this area.

72. Four Inventory sites are on existing conservation lands and are currently protected.⁵⁶ Another two sites are located over 2,000 feet upstream from the

conservation easements include: the Merrimack River Access (sheet 7), the White Sands Conservation Area (sheet 4), the Floodway Area/Hall Street Waste Water Treatment Plant Area (sheet 3), the City of Concord's West Terrill Park (sheet 2), and the NHTI/Concord Island Reserve (sheet 2).

⁵³ These eight parcels are identified in the License Application, Volume VII, Wildlife Resources, Riparian and Floodplain Lands and Riparian Land Protection, figure 2 (sheets 1-8), and described in license Article 407.

⁵⁴ These 20 parcels are identified in the License Application, Volume VII of license application, Endangered and Threatened Species, New Hampshire Natural Heritage Bureau Rare Species and Exemplary Natural Communities, Figure 3 (sheets 1-8).

⁵⁵ The inventory is maintained by the New Hampshire Natural Heritage Bureau.

⁵⁶ These lands include: the Floodway Area for the Hall Street Waste Water Treatment Plant in Concord, the City of Concord's West Terrill Park, the New Hampshire Technical Institute-Concord Island Reserve, and Society for the Protection of New Hampshire Forests conservation lands.

northernmost boundary of the project and therefore lack sufficient connection to the project. One site appears to lie within an existing residential development and would likely be unsuitable for inclusion in the project buffer.⁵⁷

73. For the remaining eight sites, we will require PSNH to study the feasibility of protecting them under the SMP. These Inventory sites are for: (1) blunt-leaved milkweed (Town of Hooksett, sheet 6);⁵⁸ (2) sweet goldenrod, Southern New England dry oak/pine forest on sandy/gravelly soils (Town of Hooksett, sheet 6); (3) wild lupine (Town of Hooksett, sheet 6); (4) golden-heather (Town of Hooksett, sheet 6); (5) Southern New England lake sediment/river terrace forest (Town of Hooksett, sheet 5); (6) common moorhen (City of Concord, sheet 3); (7) golden-heather, wild lupine, New England dry riverbluff opening (City of Concord, sheet 2); and (8) Southern New England floodplain forest (City of Concord, sheet 2).

74. Concerning the islands downstream of Amoskeag Dam, we note that, although they were not identified as bald eagle habitat, they are forested and potential habitat for eagles foraging in the Amoskeag tailrace. In addition, PSNH indicated in its application that it is amenable to designating these islands as conservation lands. Because PSNH already owns the islands, including them both within the project would have minimal cost. Therefore, the outer island will be added to the project buffer and both islands will be protected under the SMP.

75. Regarding the land along the Soucook River that Interior identified as an important riparian area that should be added to the Garvins Falls buffer zone, by continuing the Garvins Falls buffer zone land north along the western shoreline of the Soucook River, within PSNH-owned property, an additional 8 acres of riparian forest would be protected. We agree that it is reasonable to include this area and require it to be included in the SMP.

76. Article 407 requires a shoreline management plan and project boundary modification consistent with the EA's recommendation with the additional requirements of including the PSNH-owned buffer land along the Soucook River

⁵⁷ This site is occupied by wild lupine and blunt-leaved milkweed, and is located downstream of the Hooksett development on the west side of the river.

⁵⁸ The numbered sheets are found in Volume VII of the license application, Endangered and Threatened Species, New Hampshire Natural Heritage Bureau Rare Species and Exemplary Natural Communities, Figure 3.

and island downstream of the Amoskeag dam within the project boundary, as well as a report on the feasibility of acquiring the rights to protect the described parcels of land containing bald eagle roosting habitat and Natural Heritage Inventory sites.

2. Whitewater Boating

77. There is a 5.3-mile-long whitewater boating reach with class I-III rapids located immediately downstream of the Amoskeag development. In its application, PSNH proposes to explore the feasibility of providing special releases from the Amoskeag development for whitewater boating. Subsequently, in response to a staff additional information request, PSNH proposes to provide three scheduled whitewater boating releases of 3,000 cfs below Amoskeag, one during the last weekend in June (Saturday and Sunday), one during a weekend in September (Saturday and Sunday), and one on a weekend day in October (Saturday or Sunday). PSNH did not describe how its flows would be provided; however, since the whitewater reach of concern is downstream of the Amoskeag powerhouse, boating flows could be provided by generation, releases into the bypassed reach, or a combination of the two.

78. In their 10(a) recommendations, Mountain Club *et al.* recommend whitewater boating releases below the Amoskeag development as follows: (a) flows for boating events including but not limited to boating events typically scheduled during June and the weekend following Labor Day; and (b) once a week from the first week in June until the week after Labor Day, a scheduled weekday-evening release of approximately 2,500-3,000 cfs for as many hours as possible without having negative impacts on the reservoir or downstream resources.

79. Interior's 10(a) recommendations note that variances from run-of-river operation, such as boating flow releases, could adversely affect the riverine aquatic community. However, with the stipulation that PSNH ramp the flows and delay releases until after the installation and operation of a minimum bypass flow gate, Interior would not object to up to three special weekend whitewater boating releases per year. Interior also recommends that no whitewater releases be scheduled during the upstream fish passage season (April 1 through June 30) except on a case-by-case basis by mutual agreement between PSNH and the fisheries agencies.

80. PSNH, in its reply comments, agreed to conduct any whitewater boating releases required by the license and to make flow information available electronically.

81. The EA found that converting all three project developments to run-of-river operation would decrease whitewater boating opportunities downstream of Amoskeag during periods when inflow is less than the higher flows that have been historically provided during peaking operations. The EA noted, however, that boatable, albeit not always optimal, flows would still be present the majority of the time under run-of-river operation. Therefore, the EA did not recommend regularly scheduled daily or weekly whitewater boating releases as requested by Mountain Club *et al.*, but suggested that an annual boating release schedule could be developed for a limited number of releases to accommodate special boating events as long as the releases did not affect operation of the fishway or unreasonably draw down the impoundment.

82. In its EA comments, Mountain Club *et al.* state that an annual whitewater boating release schedule should provide for “at least three releases to accommodate historically scheduled events.” FWS requests in its EA comments that the schedule for a pre-set number of releases be determined by recreation user groups, and that FWS only be consulted in the case that a release is requested during upstream fish passage season. However, FWS requests that no whitewater releases that would result in an impoundment drawdown occur until the bypass flow discharge gate is installed.

83. Regarding scheduled releases at Amoskeag for whitewater boating, we are generally supportive of providing a limited number of flow releases to accommodate annual boating events. However, the project’s water quality certification does not specifically allow for deviations from run-of-river operation for whitewater releases. Rather, it permits deviations “as necessary...for reasons including, but not limited to, flashboard failure and reinstallation and the installation of new minimum flow release structures.” Article 408 therefore requires PSNH to obtain prior approval from New Hampshire DES before making any scheduled whitewater releases. Furthermore, as requested by FWS, Article 408 provides that any whitewater releases shall not commence until the bypass flow discharge gate is installed at Amoskeag dam.

84. Finally, in addition to a flow phone, Mountain Club *et al.* request that PSNH provide Internet information so the boating community can appropriately plan their use of the whitewater resource. We agree. By providing phone and internet

information on flows at Amoskeag dam, the public will be adequately informed of whitewater boating opportunities at the Merrimack Project.⁵⁹

Other Issues

A. Recreation Plan

85. Recreation facilities at the project include the Amoskeag Fishways Learning and Visitors Center, the scenic overlook at Amoskeag, and portage facilities at the Amoskeag and Hooksett dams. In its application, PSNH proposes to develop a recreation plan that would provide for the continued operation of the Amoskeag Fishways facility, as well as the continued maintenance of existing portage trails and access around the Amoskeag and Hooksett dams. PSNH also proposes to evaluate the need for access improvements such as providing portage at Garvins Falls, and the feasibility of providing whitewater boating releases, as described below.

86. The EA recommended that PSNH develop and implement its proposed recreation plan, but recommended adding a portage facility at the Garvins Falls development, and improving the portage facilities at the Amoskeag development. The EA noted that the Garvins Falls impoundment is very scenic and popular for canoeing and kayaking and providing a portage facility there would improve access and recreational navigation. Regarding the existing portage at Amoskeag, the EA noted that in its current condition it is difficult to traverse due to rip-rap at the take-out point and the steepness of the slope at the put-in.

87. We agree with the recommendations in the EA, and Article 408 requires PSNH to develop and file the EA-recommended recreation plan within six months of license issuance, and enclose all project recreation facilities within the project boundary. In addition, we will require that PSNH bring into the project the scenic overlook.

⁵⁹ They add that the schedule should also consider effects on whitewater boating from PSNH's upstream store and release Ayers Islands Project (Project No. 2456) and how this information could be made easily available to the public in a timely and useful manner. This issue is however outside the scope of this proceeding.

B. Adequacy of Information and Cumulative Effects

88. Mountain Club *et al.* filed comments opposing the issuance of a license for the Merrimack Project.

89. They assert that PSNH has failed to provide adequate information or mitigation and enhancement measures to allow the Commission to balance energy production and profits with environmental benefits in deciding whether, or under what conditions, to issue a license. In particular, they assert that the project has a relatively low annual plant capacity factor, and that improved efficiency could more than offset the cost of mitigation and enhancement measures.⁶⁰

90. The typical range of annual plant capacity factors for hydropower projects is from 40 to 50 percent,⁶¹ depending generally on available flow conditions. The annual plant capacity factors for Merrimack River Project's three developments are 59, 51, and 39 percent for Amoskeag, Hooksett, and Garvin Falls, respectively. The maximum hydraulic capacity of Garvin Fall's turbines is 6,380 cfs. The maximum hydraulic capacity plotted on the annual flow duration curve⁶² shows that flows exceed the Garvin Falls's hydraulic capacity about 23 percent of the time, or 84 days annually. The capacity of a run-of-river hydroelectric project is typically designed to correspond to average annual flows on the duration curve ranging between 15 and 30 percent exceedance.⁶³ The Merrimack River Project is within the reasonable range for plant efficiencies.

⁶⁰ See February 23, 2006 comments on the EA. Capacity factor is the ratio of the total electricity that a plant produced during a year compared to the total potential electricity that would have been produced if the plant operated at 100 percent power during every hour of the year.

⁶¹ The average capacity factor for hydroelectric plants in the U.S. is 40-50 percent. Western Area Power Administration and U.S. Department of Energy, DSM Pocket Guidebook, Volume 5: Renewable and Related Technologies for Utilities and Buildings. Undated, Table R-3.

⁶² An annual flow duration curve is a graphical representation of the natural streamflow of a river in order of magnitude and the percent of time flow is equaled or exceeded.

⁶³ See U.S. Army Corps of Engineers, Engineering and Design Hydropower, Engineering Manual No. 1110-2-1701 (1985).

91. Mountain Club *et al.* assert that the cumulative impacts analysis in the EA is deficient because it failed to consider the possibility that PSNH may install a rubber dam flashboard system at some time in the future.⁶⁴ We disagree. The National Environmental Policy Act (NEPA)⁶⁵ requires that federal agencies give appropriate consideration to cumulative effects on environmental resources. A cumulative impact is the impact on the environment that results from an incremental impact of the action when added to other past, present, and reasonably foreseeable future action regardless of what agency or person undertakes such actions.⁶⁶

92. The EA analyzed cumulative impacts to water quality, anadromous fish, and American eel within the Merrimack River Basin. The rubber dam was not mentioned in the cumulative effects analysis for eel because it was not a reasonably foreseeable future action. At the scoping meeting held on June 24, 2004, PSNH indicated that it had looked at the feasibility of installing a rubber dam at Amoskeag and determined that installation of an inflatable dam was not economically feasible. Should PSNH decide to do so in the future, it will have to file an application to amend its license and include any necessary environmental analysis of the proposed action.

National Historic Preservation Act

93. Under section 106 of the National Historic Preservation Act (NHPA),⁶⁷ and its implementing regulations,⁶⁸ federal agencies must take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register (defined as historic properties) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking. This generally requires the Commission to consult with the State Historic Preservation Officer (SHPO) to determine whether and how a proposed action may affect historic properties, and to seek ways to avoid or minimize any adverse effects.

⁶⁴ Replacement of the wooden flashboards could change the degree of leakage in the bypass reach and potentially impact eel passage.

⁶⁵ 42 U.S.C. § 4321, *et seq.* (2000).

⁶⁶ 40 C.F.R § 1508.7 (2006).

⁶⁷ 16 U.S.C. § 470 *et seq.* (2000).

⁶⁸ 36 C.F.R. Part 800 (2006).

94. To satisfy these responsibilities, on May 16, 2006, the Commission executed a Programmatic Agreement (PA) with the New Hampshire State Historic Preservation Officer (SHPO) and invited PSNH to concur with the stipulations of the PA. PSNH concurred. The PA requires the licensee to prepare and implement a Historic Properties Management Plan (HPMP). Execution of the PA demonstrates the Commission's compliance with section 106 of the NHPA. Article 409 requires PSNH to implement the PA and to file its HPMP with the Commission within one year of license issuance.

Administrative Conditions

A. Annual Charges

95. The Commission collects annual charges from licensees for administration of the FPA and for recompensing the United States for the use, occupancy, and enjoyment of its lands. Article 201 provides for the collection of funds for administration of the FPA.

B. Amortization Reserve

96. The Commission requires that, for new major licenses, licensees must set up and maintain an amortization reserve account upon license issuance. Article 205 requires the establishment of the account.

C. Exhibit F and G Drawings

97. The Commission requires licensees to file sets of approved project drawings on microfilm and in electronic file format. Article 202 requires the licensee to file approved exhibit F drawings. Because the shoreline management plan required by Article 407 will result in changes to the project boundary, Article 203 requires PSNH to file revised exhibit G drawings for Commission approval. In addition, because we have included the three substations, transmission lines, and a training wall in the license, Article 204 requires PSNH to file Exhibit F drawings for these project facilities.

D. Headwater Benefits

98. Some projects directly benefit from headwater improvements that were constructed by other licensees, the United States, or permittees. Article 206 requires the licensee to reimburse such entities for these benefits if they were not previously assessed and reimbursed.

E. Use and Occupancy of Project Lands and Waters

99. Requiring a licensee to obtain prior Commission approval for every use or occupancy of project land would be unduly burdensome. Therefore, Article 410 allows the licensee to grant permission, without prior Commission approval, for the use and occupancy of project lands for such minor activities as landscape planting. Such uses must be consistent with the purposes of protecting and enhancing the scenic, recreational, and environmental values of the project.

State And Federal Comprehensive Plans

100. Section 10(a)(2) of the FPA⁶⁹ requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, or conserving waterways affected by the project.⁷⁰ Under section 10(a)(2)(A), staff identified seven comprehensive plans that address resources in New Hampshire that are relevant to the project. Staff reviewed the plans, and no conflicts were found.⁷¹

Applicant's Plans And Capabilities

101. In accordance with sections 10(a)(2)(C) and 15(a) of the FPA,⁷² the staff has evaluated PSNH's record as a licensee with respect to the following: (1) conservation efforts; (2) compliance history and ability to comply with the license; (3) safe management, operation, and maintenance of the project; (4) ability to provide efficient and reliable electric service; (5) need for power; (6) transmission services; (7) cost effectiveness of plans; and (8) actions affecting the public. We accept the staff's findings in each of the following areas.

⁶⁹ 16 U.S.C. § 803(a)(2)(A) (2000).

⁷⁰ Comprehensive plans for this purpose are defined at 18 C.F.R. § 2.19 (2006).

⁷¹ The list of applicable plans can be found in section 9.0 of the EA for the project.

⁷² 16 U.S.C. §§ 803(a)(2)(C) and 808(a) (2000).

A. Conservation Efforts

102. Section 10(a)(2)(C) of the FPA requires the Commission to consider the extent of electric consumption efficiency programs in the case of license applicants primarily engaged in the generation or sale of electric power, like PSNH. PSNH is active in several environmentally beneficial, energy saving programs including: customer incentives, information and education, audits and surveys, and cooperative efforts with third-party contractors and other utilities. These programs show that PSNH is making an effort to conserve electricity and has made a good faith effort to comply with section 10(a)(2)(C) of the FPA.

B. Compliance History and Ability to Comply with the New License

103. Based on a review of PSNH's compliance with the terms and conditions of the existing license, staff finds that PSNH's overall record of making timely filings and compliance with its license is satisfactory. Therefore, staff believes PSNH can satisfy the conditions of a new license.

C. Safe Management, Operation, and Maintenance of the Project

104. Staff has reviewed PSNH's management, operation, and maintenance of the Merrimack River Project pursuant to the requirements of 18 C.F.R. Part 12 and the Commission's Engineering Guidelines and periodic Independent Consultant's Safety Inspection Reports. Staff concludes that the dam and other project works are safe, and that there is no reason to believe that PSNH cannot continue to safely manage, operate, and maintain these facilities under a new license.

D. Ability to Provide Efficient and Reliable Electric Service

105. Staff has reviewed PSNH's plans and its ability to operate and maintain the project in a manner most likely to provide efficient and reliable electric service. PSNH has trained operating and maintenance personnel assigned to its hydro power operations. These personnel control and assure that requirements are met for the inspection, operation, and maintenance of hydroelectric equipment and structures and PSNH has been operating the project in an efficient manner within the constraints of the existing license. Staff concludes that PSNH is capable of operating the project to provide efficient and reliable electric service in the future.

E. Need for Power

106. The Merrimack Project is located in the New England Power Pool region of the North American Electric Reliability Council (NERC). According to the NERC,

demand for electric energy in the region is expected to increase at an average rate of 1.25 percent per year through 2013. Staff concludes that the project's power, low cost, displacement of nonrenewable fossil-fired generation, and contribution to the region's diversified generation mix will help meet the need for power in the region.

F. Transmission Services

107. Each of the project's developments has a substation that directly connects to the regional grid. No changes are recommended or proposed that would affect the capability of the project to connect to the regional grid to deliver electric power to the region.

G. Cost Effectiveness of Plans

108. PSNH is not proposing any capacity expansion of the Merrimack River Project. Staff concludes that the project, as presently configured and as operated according to this order, is consistent with environmental considerations, and develops the hydropower potential of the site in a cost-effective manner.

H. Actions Affecting the Public

109. PSNH provided extensive opportunity for public involvement in the development of its application for a new license for the Merrimack River Project. During the previous license period, PSNH provided facilities to enhance the public use of project lands and facilities, and operated the project with consideration for the protection of downstream uses of the Merrimack River. PSNH uses the project to help meet local power needs and pays taxes that contribute to the cost of public services provided by local government.

Project Economics

110. In determining whether to issue a new license for an existing hydroelectric project, the Commission considers a number of public interest factors, including the economic benefits of project power. Under the Commission's approach to evaluating the economics of hydropower project, as articulated in *Mead Corporation*,⁷³ the Commission uses current costs to compare the costs of the project

⁷³ 72 FERC ¶ 61,207 (1995).

and likely alternative power, with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date.

111. The basic purpose of the Commission's economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and reasonable alternatives to project power. The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

112. In applying this analysis to the Merrimack River Project, staff has considered two options: PSNH's proposal and, the project as licensed herein. As proposed by PSNH, the estimated average annual generation of the Merrimack Project is 115,310 MWh, providing an annual power value of about \$8,000,000, or \$69.37/MWh.⁷⁴ The annual cost would be \$4,534,000, or \$39.38/MWh. To determine whether the proposed project is currently economically beneficial, staff subtracts the project's cost from the value of the power the project produces. Therefore, in the first year of operation, the project would cost \$3,465,000, or \$29.99/MWh less than the likely alternative cost of power.

113. As licensed herein with the certification conditions and staff measures, including releasing 58 cfs from the Amoskeag eastern spillway during the non-fish passage season, the annual cost of the project would be about \$4,542,000, or \$39.38/MWh. The annual power value for the estimated annual generation of 114.29 GWh, would be \$7,960,000, or \$69.02/MWh. Therefore, in the first year of operation, the project would cost \$3,458,000, or \$29.64/MWh less than the likely alternative cost of power.

114. In considering public interest factors, the Commission takes into account that hydroelectric projects offer unique operational benefits to the electric utility system (ancillary benefits). These benefits include their value as almost instantaneous load-following response to dampen voltage and frequency instability on the transmission system, system-power-factor-correction through condensing operations, and a source of power available to help in quickly putting fossil-fuel based generating stations back on line following a major utility system or regional blackout.

⁷⁴ Our estimate of the cost of alternative power is based on the Energy Information Administration's (EIA) *Annual Energy Outlook* for 2005 and its supplemental data on the EIA Internet Homepage. See <http://www.eia.doe.gov/oiaf/aeo/index.html>.

Comprehensive Development

115. Sections 4(e) and 10(a)(1) of the FPA,⁷⁵ require the Commission to give equal consideration to power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife resources; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

116. Based on the record of this proceeding, including the environmental assessment and the comments thereon, we conclude that licensing the Merrimack River Project as described in this order would not constitute a major federal action significantly affecting the quality of the human environment. The project will be safe if operated and maintained in accordance with the requirements of this license.

117. Based on our independent review and evaluation of the Merrimack River Project, mandatory conditions and recommendations from the resource agencies and other entities, and the no-action alternative, as documented in the final EA, we have selected the proposed Merrimack River Project, with the staff-recommended measures and mandatory conditions, and find that it is best adapted to a comprehensive plan for improving or developing the Merrimack River.

118. We selected this alternative because: (1) issuance of a new license will serve to maintain a beneficial, dependable, and inexpensive source of electric energy; (2) the required environmental measures will protect and enhance fish and wildlife resources, water quality, recreational resources, and historic properties; and (3) the 29.9 MW of electric energy generated from this renewable resource will continue to offset the use of fossil-fueled, steam-electric generating plants, thereby conserving nonrenewable resources and reducing atmospheric pollution.

⁷⁵ 16 U.S.C. §§ 797(e) and 803(a)(1) (2000).

License Term

119. Section 15(e) of the FPA,⁷⁶ provides that any new license issued shall be for a term which the Commission determines to be in the public interest, but not less than 30 years or more than 50 years. The Commission's general policy is to establish 30-year terms for projects with little or no redevelopment, new construction, new capacity, or environmental mitigation and enhancement measures; 40-year terms for projects with a moderate amount of such activities; and 50-year terms for projects with extensive measures.⁷⁷

120. This license requires a moderate amount of environmental mitigation and enhancement measures, primarily related to the cost of operational changes such as operating all three developments in a run-of-river mode and providing minimum flows to the bypassed reaches.⁷⁸ Consequently, a 40-year license for the Merrimack River Project is appropriate.

The Commission orders:

(A) This license is issued to Public Service Company of New Hampshire (licensee) for a period of 40 years, effective the first day of the month in which this order is issued, to operate and maintain the Merrimack River Project. This license is subject to the terms and conditions of the FPA, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in these lands, described in the project description and the project boundary discussion of this order.

(2) The project works consisting of: The Amoskeag Development: (1) a 29-foot-high, 710-foot-long concrete gravity dam comprised of: (i) a low crest section

⁷⁶ 16 U.S.C. § 808(e) (2000).

⁷⁷ See *Consumers Power Company*, 68 FERC ¶ 61,077 at 61,383-84 (1994).

⁷⁸ As indicated in the EA and the 10(j) meeting summary, the combined annual cost of run-of-river operation and minimum flows for the bypassed reaches is estimated at \$568,000.

with 5-foot-high flashboards; and (ii) a high crest section with 3-foot-high flashboards; (2) a stone masonry training wall; (3) a 7-mile-long, 478-acre reservoir; (4) a powerhouse, integral with the dam, containing three generating units with a total installed capacity of 16,000 kW; (5) a 415-foot-long, 34.5-kV double circuit transmission line; (6) a substation; and (7) other appurtenances.

The Hooksett Development: (1) a dam comprised of: (i) a 340-foot-long stone masonry section with 2-foot-high flashboards connected to; (ii) a 250-foot-long concrete section with 2-foot-high flashboards; (2) a 15-foot-by 20-foot Taintor gate; (3) a 5.5-mile-long, 405-acre reservoir; (4) a powerhouse containing a single generating unit with an installed capacity of 1,600 kW; (5) a substation; and (6) other appurtenances.

The Garvins Falls Development: (1) an 18-foot-high, 550-foot-long concrete and granite gravity dam comprised of: (i) a low crest section with 3-foot-high flashboards; and (ii) a high crest section with 1.2-foot-high flashboards; (2) an 8-mile-long, 640-acre reservoir; (3) a 500-foot-long water canal with a 10-foot-wide waste gate; (4) two powerhouses, each containing two generating units for a total installed capacity of 12,300 kW; (5) a 340-foot-long, 34.5-kV transmission line; (6) a substation; and (7) other appurtenances.

The project works generally described above are more specifically shown and described by those portions of exhibit A and F shown below:

Exhibit A: The following sections of Exhibit A, filed on December 30, 2003:

Page A-1 through A-15.

Exhibit F: The following sections of Exhibit F, filed on December 30, 2003:

| Exhibit F Drawing | FERC No. 1893- | Description |
|-------------------|----------------|---|
| Sheet 1 | 1014 | Garvin Falls Development Plan and Dam |
| Sheet 2 | 1015 | Garvin Falls Development Dam and Canal Sections |
| Sheet 3 | 1016 | Garvin Falls Development Spillway Sections |
| Sheet 4 | 1017 | Garvin Falls Development Headgate Structure Plan and Sections |

| | | |
|---------|------|--|
| Sheet 5 | 1018 | Garvin Falls Development Original Powerhouse Plan and Sections |
| Sheet 6 | 1019 | Garvin Falls Development New Powerhouse Plan and Sections |
| Sheet 1 | 1020 | Amoskeag Development Dam Plan |
| Sheet 2 | 1021 | Amoskeag Development Powerhouse Plan |
| Sheet 3 | 1022 | Amoskeag Development Section through Powerhouse |
| Sheet 4 | 1023 | Amoskeag Development Powerhouse Intake Plan |
| Sheet 5 | 1024 | Amoskeag Development Dam and Tunnel |
| Sheet 1 | 1025 | Hooksett Development Dam Plan and Sections |
| Sheet 2 | 1026 | Hooksett Development Dam Plan and Sections |
| Sheet 3 | 1027 | Hooksett Development Powerhouse Plan and Sections |

(3) All of the structures, fixtures, equipment, or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be employed in connection with the project, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The Exhibits A and F described above are approved and made part of this license. The Exhibit G drawings filed as part of the application for license do not conform to Commission regulations and are not approved.

(D) This license is subject to the conditions submitted by the New Hampshire Department of Environmental Services under section 401 of the Clean Water Act, 33 U.S.C. § 1431(a)(1)(2000), as those conditions are set forth in Appendix A of this order.

(E) This license is subject to the conditions submitted by the Secretary of the U.S. Department of Interior under section 18 of the FPA, as those conditions are set forth in Appendix B to this order.

(F) This license is subject to the articles set forth in Form L-3 (October 1975), entitled *Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States* (see 54 FPC 1799 *et seq.*), as reproduced at the end of this order, and the following additional articles:

Article 201. *Administrative Annual Charges.* The licensee shall pay the United States annual charges, effective the first day of the month in which the license is issued, for the purposes of reimbursing the United States for the cost of administration of Part I of the Federal Power Act, as determined in accordance with provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 29.9 megawatts.

Article 202. *Exhibit Drawings.* Within 45 days of the date of issuance of this license, the licensee shall file the approved exhibit drawings in aperture card and electronic file formats.

a) Three sets of the approved exhibit drawings shall be reproduced on silver or gelatin 35mm microfilm. All microfilm shall be mounted on type D (3-1/4" X 7-3/8") aperture cards. Prior to microfilming, the FERC Drawing Number (e.g., P-1893-1001 through P-1893-1027) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number shall be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (e.g., F-1, etc.), Drawing Title, and date of this license shall be typed on the upper left corner of each aperture card.

Two of the sets of aperture cards shall be filed with the Secretary of the Commission, ATTN: OEP/DHAC. The third set shall be filed with the Commission's Division of Dam Safety and Inspections New York Regional Office.

b) The licensee shall file two separate sets of exhibit drawings in electronic raster format with the Secretary of the Commission, ATTN: OEP/DHAC. A third set shall be filed with the Commission's Division of Dam Safety and Inspections New York Regional Office. The drawings must be identified as (CEII) material under 18 CFR § 388.113(c). Each drawing must be a separate electronic file, and the file name shall include: FERC Project Drawing Number, FERC Exhibit, Drawing Title, date of this license, and file extension [e.g., P-1893-1001, F-1, Description, MM-DD-YYYY.TIF]. Electronic drawings shall meet the following format specification:

IMAGERY - black & white raster file

FILE TYPE – Tagged Image File Format, (TIFF) CCITT Group 4

RESOLUTION – 300 dpi desired, (200 dpi min)
DRAWING SIZE FORMAT – 24” X 36” (min), 28” X 40” (max)
FILE SIZE – less than 1 MB desired

Article 203. Exhibit G Drawings. Within 90 days of the effective date of the license, the licensee shall file, for Commission approval, revised Exhibit G drawings enclosing within the project boundary all principal project works necessary for operation and maintenance of the project, including the project’s transmission facilities and substations, the Amoskeag Fishways Learning and Visitors Center, the Amoskeag Scenic Overlook, portage facilities at the Amoskeag and Hooksett dams, and the following PSNH-owned parcels that are identified in volume VII of the license application filed July 2003, Endangered and Threatened Species Report (figure 2, sheets 1-8) and Wildlife Resources, Riparian and Floodplain Lands and Riparian Land Protection Report (figure 2, sheets 1-8), for inclusion in the project’s shoreline management plan required by article 407:

- (a) the two islands immediately downstream from the Amoskeag dam (sheet 8);
- (b) approximately 2 acres of known bald eagle perching and foraging habitat on the east side of the river upstream of the Amoskeag dam (sheet 8);
- (c) approximately 9 acres of potential bald eagle roosting habitat located within 200 feet of the shoreline on the west side of the river about a mile and a half downstream from the Garvins Falls dam and just upstream of the coal fired Merrimack Power Plant in Bow (sheet 4);
- (d) approximately 7 acres of bald eagle perching and foraging habitat within 200 feet of the shoreline on the west side of the river immediately downstream from the Garvins Falls dam (sheet 3); and
- (e) approximately 78 acres of land at the Garvins Falls development along the east side of the river and along the western shore of the Soucook River, which includes: approximately 53 acres of an undeveloped habitat block of potential importance for bald eagle; approximately 13 acres of bald eagle known perching and foraging habitat immediately downstream from the Garvins Falls dam; and 12 acres that are not identified as eagle habitat but are forested land along the Merrimack and Soucook Rivers (sheet 3). This buffer zone shall extend beyond

200 feet as necessary in order to include the Natural Heritage Inventory site adjacent to the Garvins Falls dam.

The Exhibit G drawings must comply with sections 4.39 and 4.41 of the Commission's regulations, 18 C.F.R. §§ 4.39 and 4.41 (2006).

Article 204. Exhibit F Drawings. Within 90 days of the effective date of the license, the licensee shall file for Commission approval Exhibit F drawings showing a plan view of the substations and related transmission facilities at all three developments. The Exhibit F drawings must comply with sections 4.39 and 4.41 of the Commission's regulations, 18 C.F.R. §§ 4.39 and 4.41 (2006).

Article 205. Amortization Reserve. Pursuant to section 10(d) of the Federal Power Act, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The licensee shall set aside in a project amortization reserve account at the end of each fiscal year one half of the project surplus earnings, if any, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the licensee shall deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The licensee shall set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The licensee shall maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves shall be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly included in the licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rate for such ratios shall be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department's 10-year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 206. Headwater Benefits. If the licensee's project was directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those

headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the licensee shall reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license. The benefits will be assessed in accordance with Part 11, Subpart B, of the Commission's regulations.

Article 301. Contract Plans and Specifications. At least 60 days prior to the start of project-related construction, including construction of the flow release structure on the eastern end of the Amoskeag development, the licensee shall submit one copy of its plans and specifications design document to the Commission's Division of Dam Safety and Inspections - New York Regional Engineer, and two copies to the Commission (one of these shall be a courtesy copy to the Director, Division of Dam Safety and Inspections). The submittal to the Regional Engineer must include a supporting design report for pertinent features of the project, such as water retention structures, powerhouse and/or powerhouse addition, and water conveyance structures. The supporting design report shall be consistent with the Commission's Engineering Guidelines. The submittal must also include as part of preconstruction requirements: a Quality Control and Inspection Program, Temporary Construction Emergency Action Plan, and Soil Erosion and Sediment Control Plan. The licensee shall not begin construction until the Regional Engineer has approved in writing the plans and specifications and determined that all preconstruction requirements have been satisfied.

Article 302. Cofferdam Construction Drawings. Before starting construction, the licensee shall review and approve the design of contractor-designed cofferdams and deep excavations and shall make sure construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days before starting construction of the cofferdam, the licensee shall submit one copy to the Commission's Division of Dam Safety and Inspections - New York Regional Engineer and two copies to the Commission (one of these copies shall be a courtesy copy to the Director, Division of Dam Safety and Inspections), of the approved cofferdam construction drawings and specifications and the letters of approval.

Article 303. As-built Drawings. Within 90 days of completion of construction of the facilities authorized by this license, including the flow release structure on the eastern end of the Amoskeag development, the licensee shall file for Commission approval revised exhibits A, F, and G, as applicable, to describe and show those project facilities as built. A courtesy copy shall be filed with the Commission's Division of Dam Safety and Inspections - New York Regional

Engineer, and the Director, Division of Hydropower Administration and Compliance.

Article 401. Commission Filings. The New Hampshire Department of Environmental Service's (New Hampshire DES) water quality certification issued on May 10, 2005, and attached to this license as Appendix A, requires the licensee to file certain reports and notifications with New Hampshire DES. The licensee shall also file the following reports and notifications with the Commission, according to the schedule set forth below.

| Condition No. | Name | Due Date |
|---------------|--|--|
| E-6 | Run-of-river Feasibility Study Report | Within six months of license issuance |
| E-8 | Fish Passage Facilities Status Report | Annually by December 31 |
| E-7(d) | Notification of Substantial Deviation from Operations Plan | Within 24 hours after each such incident |
| E-7(e) | Exceptions to Run-of-River Operations | Prior to implementing such modifications, if possible, or in the event of an emergency, as soon as possible, but no later than ten days after each such incident |

Article 402. Amoskeag Minimum Bypassed Reach Flow in Western Channel. In addition to the minimum flow requirements for the Amoskeag bypassed reach required by Appendix A of this license, to protect and enhance aquatic habitat in the western channel during the non-fish passage seasons (i.e., July 1 through September 14, and November 1 through March 31), the licensee shall release a minimum flow of 58 cubic feet per second from the fish bypass gate into the western channel of the Amoskeag bypassed reach.

Article 403. Ramping Rates. To protect aquatic habitat below the project developments whenever the impoundments are being refilled after drawdowns for project maintenance or in other instances when the project deviates from run-of-

river operation, the project shall be returned to run of river at the following maximum rate of flow change: (a) 1,550 cubic feet per second per hour (cfs/hr) at Amoskeag and Hooksett; and (b) 1,377 cfs/hr at Garvins Falls.

Article 404. *Tailrace minimum flows during impoundment refilling periods.* To protect aquatic habitat below the project developments whenever the impoundments are being refilled after drawdowns for project maintenance or in other instances when the project deviates from run-of-river operation, the licensee shall release minimum flows in the tailrace of 1,427 cubic feet per second (cfs) at Amoskeag, 1,403 cfs at Hooksett, and 1,214 cfs at Garvins Falls. If flows in the river are below these levels, then the licensee shall release 90 percent of the inflow to the respective reservoir.

Article 405. *Comprehensive Operations Compliance Monitoring Plan.* Within six months of license issuance, the licensee shall file with the Commission, for approval, a comprehensive operations compliance monitoring plan. The plan shall include at a minimum: (1) the operations compliance monitoring requirements of condition E-7 of Appendix A of this license; and (2) procedures for complying with the ramping flows, tailrace minimum flows, Amoskeag bypassed reach western channel minimum flows, and fish passage flows required by this license.

The licensee shall prepare the monitoring plan after consultation with the U.S. Fish and Wildlife Service, New Hampshire Department of Fish and Game, and New Hampshire Department of Environmental Services. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 406. *Reservation of Authority to Prescribe Fishways.* Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or to provide for the construction, operation, and maintenance of such fishways as may be prescribed by the Secretary of the Interior pursuant to section 18 of the Federal Power Act.

Article 407. Shoreline Management Plan. Within one year of license issuance, the licensee shall file for Commission approval a shoreline management plan (SMP) for the project. The plan shall include, at a minimum:

- (1) a discussion of the plan's purpose, goals, and objectives;
- (2) a discussion of key issues associated with shoreline management at the project, and how these issues were addressed in developing the plan;
- (3) an identification and description of land use along the project shoreline, including maps identifying the locations of land use types, a description of how these use classifications were defined and delineated, and descriptions of activities and uses that would be allowed within those classifications;
- (4) a description of all types of permitted uses, the permit application process, and guidelines for applying for a construction permit within the project boundary;
- (5) measures to protect water, fish, and wildlife during shoreline development;
- (6) a description of management policies, monitoring programs, and enforcement;
- (7) provisions for periodically reviewing and updating the plan;
- (8) provisions for consultation with agencies and other interested entities in the implementation of the plan;
- (9) provisions for coordination with the recreation plan (Article 408) and historic properties management plan (Article 409);
- (10) measures to protect the bald eagle and its habitat within the project boundary (including those lands identified in Article 203), including, at a minimum:
 - (a) provisions for annual surveys to monitor for bald eagle presence and habitat use (both nesting and roosting);
 - (b) provisions for reporting the results of monitoring;
 - (c) provisions for defining and maintaining specific buffer distances around any roost sites and nest sites located at the project including expanding specific buffer areas beyond 200-feet as necessary;

- (d) measures to identify, protect, and enhance winter roosting habitat, including specific timber management practices to enhance potential roosting or nesting habitat;
 - (e) provisions for consultation with the Commission, the U.S. Department of the Interior, and the New Hampshire Department of Fish and Game (New Hampshire Fish and Game) prior to conducting significant land-disturbing activities, as defined by the SMP, on project lands with bald eagle habitat;
- (11) A report on the feasibility of protecting each of the following areas, listed from south to north as identified in volume VII of the license application filed in July 2003, Endangered and Threatened Species Report (figure 2, sheets 1-8 and figure 3, sheets 1-8):
- (a) approximately 9 acres of known bald eagle roosting habitat in the City of Manchester (sheet 7);
 - (b) approximately 5 acres of potential bald eagle roosting habitat in the Town of Hooksett which are adjacent to 3 additional acres that are already conservation lands (sheet 7);
 - (c) the Natural Heritage Inventory site for blunt-leaved milkweed in the Town of Hooksett (sheet 6);
 - (d) the Natural Heritage Inventory site for sweet goldenrod, Southern New England dry oak/pine forest on sandy/gravelly soils in the Town of Hooksett (sheet 6);
 - (e) the Natural Heritage Inventory site for wild lupine in the Town of Hooksett (sheet 6);
 - (f) approximately 5 acres of potential bald eagle roosting habitat in Town of Hooksett, which includes a Natural Heritage Inventory site for the noctuid moth, the barrens xylotype, the northern blazing star, and New England pitch pine/scrub oak barrens (sheet 6);
 - (g) the Natural Heritage Inventory site for golden-heather in the Town of Hooksett (sheet 6);

- (h) approximately 12 acres of potential bald eagle roosting habitat in the Town of Hooksett (sheet 6);
- (i) the Natural Heritage Inventory site for Southern New England lake sediment/river terrace forest in the Town of Hooksett (sheet 5);
- (j) approximately 12 acres of known bald eagle roosting habitat in the Town of Hooksett, which includes a Natural Heritage Inventory site for golden heather (sheet 5);
- (k) a section of the shoreline that is identified as bald eagle perching and foraging habitat on PSNH-owned land in the Town of Bow (sheet 4);
- (l) approximately 3 acres of potential bald eagle roosting habitat in the Town of Pembroke, which are adjacent to 5.5 additional acres that are already conservation lands (sheet 4);
- (m) the Natural Heritage Inventory site for common moorhen in the City of Concord (sheet 3);
- (n) the Natural Heritage Inventory site for golden-heather, wild lupine, New England dry riverbluff opening in the City of Concord (sheet 2);
- (o) the Natural Heritage Inventory site for Southern New England floodplain forest in the City of Concord (sheet 2)
- (p) an approximately 5-acre island in the City of Concord, which is identified as both potential roosting and potential nesting habitat for bald eagles (sheet 1); and
- (q) approximately 6 acres of potential roosting and potential nesting habitat for bald eagles in the City of Concord (sheet 1).

The licensee shall prepare the plan after consultation with the U.S Fish and Wildlife Service, New Hampshire Department of Fish and Game, and the New Hampshire Department of Environmental Services. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan.

The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. No land-disturbing activities shall begin at the project until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 408. Recreation Plan. Within six months of license issuance, the licensee shall file with the Commission, for approval, a recreation plan. The plan shall include, at a minimum:

- (1) a conceptual design drawing for a new portage facility at the Garvins Falls development;
- (2) a conceptual design drawing(s) for improvements to the existing portage facilities at the Amoskeag development to ease river entry and egress;
- (3) continued operation and maintenance of the Amoskeag Fishways facility, the Amoskeag Scenic Overlook, and the portage facility at the Hooksett development;
- (4) as-built drawings of all existing project recreation facilities;
- (5) inclusion within the revised project boundary required by Article 203 of all existing and new project recreation facilities;
- (6) a schedule for completing, within one year of license issuance, the recreation improvements;
- (7) a provision for a limited number of annual flow releases (to be instituted only after bypass flow discharge gate is installed) from the Amoskeag development to support whitewater boating events provided that agreement can be reached among the New Hampshire Department of Environmental Services and U.S. Fish and Wildlife Service on the schedule, magnitude, and duration of the flow releases consistent with the requirements of the water quality certification and the fishway prescription;

(8) documentation of concurrence from the New Hampshire Department of Environmental Services and U.S. Fish and Wildlife Service on any flow release schedule proposed pursuant to item (7); and

(9) provision of a notification system to provide information on river flows downstream of the Amoskeag powerhouse.

The licensee shall prepare the plan after consultation with the New Hampshire Department of Fish and Game, New Hampshire Department of Environmental Services, Appalachian Mountain Club, American Whitewater, New England FLOW, the New Hampshire Rivers Council, and the Concerned Citizens of Bow. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies and organizations, and specific descriptions of how the comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies and organizations to comment and to make recommendations before filling the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 409. Programmatic Agreement and Historic Properties Management Plan. The licensee shall implement the "Programmatic Agreement Among the Federal Energy Regulatory Commission and the New Hampshire State Historic Preservation Officer for Managing Historic Properties That May Be Affected By Issuing a License to Public Service of New Hampshire For the Continued Operation of the Merrimack River Hydroelectric Project In Merrimack and Hillsborough Counties, New Hampshire (FERC Project No. 1893)" executed on May 16, 2006, including but not limited to the Historic Properties Management Plan (HPMP) for the project. Pursuant to the requirements of this Programmatic Agreement, the licensee shall file, for Commission approval, a HPMP within one year of issuance of this order. The Commission reserves the authority to require changes to the HPMP at any time during the term of the license. If the Programmatic Agreement is terminated prior to Commission approval of the HPMP, the licensee shall obtain approval from the Commission and the New Hampshire State Historic Preservation Officer, before engaging in any ground-disturbing activities or taking any other action that may affect any historic properties within the project's area of potential effects.

Article 410. Use and Occupancy. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require

the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed. If no conveyance was made during the prior calendar year, the licensee shall so inform the Commission in writing no later than January 31 of each year.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Energy Projects, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map

may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article

from the project shall be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(G) The licensee shall serve copies of any Commission filing required by this order on any entity specified in the order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(H) This order is final unless a request for rehearing is filed within 30 days from the date of its issuance, as provided in section 313(a) of the FPA. The filing of a request for rehearing does not operate as a stay of the effective date of this license or of any other date specified in this order, except as specifically ordered by the Commission. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

By the Commission. Commissioner Kelly concurring with a separate statement attached.

(S E A L)

Kimberly D. Bose,
Secretary.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Public Service Company of New Hampshire

Project No. 1893-042

(Issued May 18, 2007)

KELLY, Commissioner, *concurring*:

The Department of Interior filed Federal Power Act section 18 prescriptions in this proceeding which require the licensee to, among other things, conduct effectiveness studies of existing fishways in the Merrimack River. This order notes that the environmental assessment prepared for this project recommended delaying a requirement to conduct the studies until fish populations increase, and that, while the Commission agrees with this recommendation, we are nevertheless required to implement Interior's section 18 prescriptions because of their mandatory nature.

For the reasons I stated in *Public Utility District No. 1 of Pend Oreille County*,¹ I believe that it is inappropriate for the Commission to comment, in an order, on the merits of mandatory conditions issued by a sister agency. Here, the environmental assessment speaks for itself.

In all other respects, I support the findings set forth in this order.

Suedeem G. Kelly

¹ 117 FERC ¶61,205 (November 17, 2006).

Form L-3
(October, 1975)
FEDERAL ENERGY REGULATORY COMMISSION
TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED
MAJOR PROJECT AFFECTING NAVIGABLE
WATERS OF THE UNITED STATES

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, that if the licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project area and project works shall be in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Article 4. The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and supervision of the Regional Engineer, Federal Energy Regulatory Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate,

who shall be the authorized representative of the Commission for such purposes. The licensee shall cooperate fully with said representative and shall furnish him such information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and shall notify him of the date upon which work with respect to any alteration will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The licensee shall submit to said representative a detailed program of inspection by the licensee that will provide for an adequate and qualified inspection force for construction of any such alterations to the project. Construction of said alterations or any feature thereof shall not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction maintenance, and operation of the project. The licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights or occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in section 14 of the Federal Power Act, or is transferred to a new licensee or to a nonpower licensee under the provisions of section 15 of said Act, the licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of

the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the licensee or created or incurred after the issuance of the license: Provided, that the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the licensee.

Article 7. The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may mutually agreed upon. The licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 10. The licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission any direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the

equitable sharing of benefits by the licensee as the Commission may order.

Article 11. Whenever the licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

Article 12. The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes; and the licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant

possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders that may have been adopted with respect to the use of such waters.

Article 14. In the construction or maintenance of the project works, the licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

Article 15. The licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the licensee shall permit the United States or its designated agency to use, free of cost, such of the licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the licensee of any obligation under this license.

Article 17. The licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable

modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, that the licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 21. Material may be dredged or excavated from, or placed as fill in, project lands and/or waters only in the prosecution of work specifically authorized under the license; in the maintenance of the project; or after obtaining Commission approval, as appropriate. Any such material shall be removed and/or deposited in such manner as to reasonably preserve the environmental values of the project and so as not to interfere with traffic on land or water. Dredging and filling in a navigable water of the United States shall also be done to the satisfaction of the District Engineer, Department of the Army, in charge of the locality.

Article 22. Whenever the United States shall desire to construct, complete, or improve navigation facilities in connection with the project, the licensee shall convey to the

United States, free of cost, such of its lands and rights of way and such rights of passage through its dams or other structures, and shall permit such control of its pools, as may be required to complete and maintain such navigation facilities.

Article 23. The operation of any navigation facilities that may be constructed as a part of, or in connection with, any dam or diversion structure constituting a part of the project works shall at all times be controlled by such reasonable rules and regulations in the interest of navigation, including control of the level of the pool caused by such dam or diversion structure, as may be made from time to time by the Secretary of the Army.

Article 24. The licensee shall furnish power free of cost to the United States for the operation and maintenance of navigation facilities in the vicinity of the project at the voltage and frequency required by such facilities and at a point adjacent thereto, whether said facilities are constructed by the licensee or by the United States.

Article 25. The licensee shall construct, maintain, and operate at its own expense such lights and other signals for the protection of navigation as may be directed by the Secretary of the Department in which the Coast Guard is operating.

Article 26. If the licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the licensee or its agent, the Commission will deem it to be the intent of the licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the licensee to surrender the license.

Article 27. The right of the licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the

terms and conditions of this license.

Article 28. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

APPENDIX A

Conditions filed by the New Hampshire Department of Environmental Services on May 10, 2005, pursuant to section 401 of the Clean Water Act, for the new license for Project No. 1893

E-1. A copy of this modified 401 Certification shall be posted within each of the Project powerhouses within seven days of issuance of the new Commission license.

E-2. The Applicant shall allow the Department to inspect the Project at any time to monitor compliance with the conditions of this modified 401 Certification.

E-3. The Applicant acknowledges a Total Maximum Daily Load (TMDL) study will occur in the Merrimack River that will include segments of the Merrimack River within the Project boundary. The issuance of this modified 401 Certification shall not affect or change the obligation of the Applicant to participate in any TMDL study and to comply with any TMDL requirement. Participation may include, but is not limited to, assistance with monitoring or dam operation to facilitate development of the TMDL. The Applicant may be asked to consult with the Department during the development of the TMDL and to comply with all applicable provisions of any final TMDL.

E-4. The Applicant shall provide minimum flow releases in Project tailwaters, as follows, for the protection of aquatic life until such time that the Project is operated in run-of-river mode in accordance with the approved operations plan described in section E-7 of this certification.

- a. Garvins Falls: 719 cfs or inflow, whichever is lower;
- b. Hooksett: 819 cfs or inflow, whichever is lower; and
- c. Amoskeag: 833 cfs or inflow, whichever is lower.

E-5. Unless otherwise permitted in the approved operations plan, and upon implementation of the approved operations plan as described in section E-7 of this modified 401 Certification, the Applicant shall, at all times, provide minimum flow releases in Project bypass reaches for the protection of aquatic life, as follows:

- a. Garvins Falls: 55 cfs in the mainstem bypass and 23 cfs in the downstream fish bypass channel;
- b. Hooksett: 64 cfs; and
- c. Amoskeag: In accordance with Table 1.

Table 1. Minimum river flow releases in the Amoskeag bypass for the Merrimack River Hydroelectric Project, FERC No. 1893.

| West Channels | | | | | | |
|--|---|--------------|-----------|-----------|-------|--------------|
| | Description | East Channel | Riffle 15 | Riffle 16 | Total | Bypass Total |
| Apr. 1 – June 30 and Sept. 15 – Oct. 31 | 280 cfs from eastern spillway | 249 | 5 | 26 | 31 | 429 |
| | 149 cfs from 2.0 ft. opening in the fish bypass gate (crest-gate) | | 125 | 24 | 149 | |
| | Total | 249 | 130 | 50 | 180 | |
| July 1 – Sept. 14 and Nov. 1 – Mar. 31 | 280 cfs from eastern spillway | 249 | 5 | 26 | 31 | 280 |

E-6. The Applicant shall evaluate the ability of the developments to maintain constant water surface elevations and/or constant downstream flows during times of daily power generation. The evaluation shall include, but not be limited to, a run-of-river scenario where water levels fluctuations in Project impoundments do not exceed 0.25 feet. Unless otherwise approved by the Department, the Applicant shall complete the evaluation by September 30, 2005, and submit a report containing the results of the evaluation to the Department by October 31, 2005. The results of the evaluation shall be used to develop the run-of-river operations plan described In E-7 of this modified 401 Certification.

E-7. The Applicant shall operate the Project in run-of-river mode, as follows:

- a. The Applicant shall develop an operations plan that shall
 - i. Define, in detail, run-of-river operations, including, but not limited to, provisions for the maintenance of constant water levels in the impoundments and/or constant river flows downstream from Project dams;
 - ii. Provide compliance monitoring, including reservoir levels, outflow, and if necessary, inflow, at the Garvins Falls, Hooksett, and Amoskeag developments unless otherwise approved by the Department;

- iii. Describe the spillway and downstream fish bypass configurations, including design drawings, used to maintain the minimum flows in the bypass reaches described in Condition E-5 of this modified 401 Certification;
 - iv. Describe contingency procedures to maintain minimum flows in the bypass reaches or tailraces during periods of failures of the spillway flashboards or fish bypass configurations (*e.g.*, obstructions) or emergency shutdowns;
 - v. Identify spillway and downstream fish passage facility configurations at the Amoskeag dam for distributing water to the east and west channels of the Amoskeag bypass reach;
 - vi. Describe how the tailrace and bypass channel flows will be impacted when inflows are less than the sum of the permitted minimum tailrace and bypass channel flows described in section E-4 and E-5 of this modified 401 Certification; and
 - vii. Provide a design and implementation schedule for all activities included in the operations plan.
- b. The Applicant shall develop the operations plan in consultation with the Department, New Hampshire Fish and Game Department (NH F&G), U.S. Fish and Wildlife Service (USFWS), and U.S. Environmental Protection Agency (USEPA). The operations plan shall be submitted to the Department for review and approval by December 31, 2005, unless otherwise approved by the Department.
- c. The Applicant shall implement the operations plan, excluding the construction of a new minimum river flow release structure, as soon as possible, but not later than 90 days after issuance of the new Commission license for the Project, unless otherwise approved by the Department. The construction and operation of a new minimum river flow release structure shall be completed no later than December 31, 2006. Any proposed modifications to the approved operations plan shall be submitted to the Department for review and approval. Proposed modifications shall not be implemented until after approval by the Department.
- d. The Applicant shall notify the Department not more than 24 hours after any substantial deviation from the approved operations plan and shall maintain a log of deviations, which shall be submitted annually to the Department not later than December 31 of each year.

- e. Exceptions to run-of-river operations may be granted by the Department, as necessary, in consultation with the Applicant, USFWS, NH F&G, and USEPA for reasons including, but not limited to, flashboard failure and reinstallation and the installation of new minimum flow release structures.

E-8. The Applicant shall enhance upstream and downstream fish passage at the Amoskeag, Hooksett, and Garvins Falls developments according to the prescriptions defined in *A Comprehensive Plan for the Provision of Anadromous Fish Passage Measures and Facilities at PSNH's Merrimack-Pemigewassett River Hydroelectric Dams, FERC Project Nos. 1893, 2456, and 2457* (Comprehensive Plan) published in 1986. The Applicant shall maintain the agreements established under the Comprehensive Plan, including, but not limited to, the construction of upstream fish passage at the Hooksett development after the fifth year following the annual passage of 15,000 American shad at the Amoskeag development, and the construction of upstream passage facilities at the Garvins Falls development after the fifth year following the annual passage of 15,000 American shad at the Hooksett development. The Applicant shall also conduct studies, as necessary, to determine the effectiveness of the downstream passage facilities at the Garvins Falls, Hooksett, and Amoskeag developments relative to Atlantic salmon smolts, American shad, and alewife. After the fourth year following the annual passage of 15,000 American shad at either the Amoskeag or Hooksett development, the Applicant shall submit annual status reports to the Department by December 31 regarding the design, construction, and anticipated completion date of fish passage facilities.

E-9. The Applicant shall operate and maintain the Project consistent with the conditions of this modified 401 Certification.

- a. The manner in which the Project is operated shall not contribute to violations of NH surface water quality standards. If it is determined that the manner of project operation contributes to violations of surface water quality standards, additional conditions may be imposed or conditions amended by the Department, when authorized by law and after notice and opportunity for hearing.

- b. The Applicant shall consult with the Department regarding any proposed modifications to the Project or its operation that may not be in accordance with this modified 401 Certification to determine whether this modified 401 Certification requires amendment or if a new 401 Certification is required for the Project. Any amendment of this modified 401 Certification or the issuance of

a new 401 Certification, determined appropriate by the Department, shall be required prior to the implementation of any modifications to the Project.

E-10. The conditions of this modified 401 Water Quality Certification may be amended and additional terms and conditions added as necessary to ensure compliance with NH surface water quality standards, when authorized by law, and after notice and opportunity for hearing.

E-11. The Department may, at any time, request from the Commission the reopening of the license to consider modifications to the license as necessary to ensure compliance with NH surface water quality standards.

APPENDIX B

Prescriptions filed by the U.S. Department of the Interior, Fish and Wildlife Service, on December 26, 2006, pursuant to section 18 of the FPA, for the new license for Project No. 1893

10. Prescription for Fishways

Pursuant to section 18 of the Federal Power Act, as amended, the Secretary of the Department of the Interior, as delegated to the Service, exercises his authority to prescribe the construction, operation and maintenance of such fishways as deemed necessary.

10.1 General Prescriptions for the Merrimack River Projects

To ensure the immediate and timely contribution of the fishways to the ongoing and planned anadromous and catadromous fish restoration and enhancement program in the Merrimack River, the following are included and shall be incorporated by the Licensee to ensure the effectiveness of the fishways pursuant to section 1701(b) of the 1992 National Energy Policy Act (Pub. L. 102-486, Title XVII, 106 Stat. 3008), and the Energy Policy Act of 2005 (Pub. L. 109-58)

a. Fishways shall be constructed, operated, and maintained to provide safe, timely and effective passage for Atlantic salmon, American shad, blueback herring, alewife and American eels at the licensee's expense.

b. Design populations

The total number of returning fish reaching the project during the term of the new license will depend on a number of factors, including overall stock recruitment of fish populations undergoing restoration. Overall fishway efficiency and cumulative losses of fish attempting to use upstream and downstream fish passage facilities also will affect the total potential restored run of shad, river herring, salmon and eels.

(1) Shad and river herring:

The Merrimack River Basin includes over 430,000 100 yard units of habitat for American shad (USFWS 1982) or about 9,000 acres of habitat. This habitat has the potential to support a shad population approaching 1 million shad and 2.5 million river herring. Of this, 44% of the habitat is upstream from the project, yielding substantial returns of fish upstream from the project. However, reaching this population size would depend on at sea conditions for growth and survival, ocean harvest, effective fish passage facilities at

all dams and normal river flows during the passage season.

As restoration potential is realized, passage facilities at project dams would need to pass substantial numbers of fish. However, a more immediate need is to provide shad and herring access to currently unavailable habitat. Therefore, while the prescribed facilities will pass significant numbers of shad and herring, expansion of these facilities may be needed in the future if prescribed facilities cannot pass all returning fish as full restoration potential is realized.

(2) Atlantic salmon:

Adult Atlantic salmon returning to the Merrimack River are all trapped at the Lawrence Dam fishway and either transported to the Nashua National Fish Hatchery for spawning and egg collection or are transported to the Pemigewasset River for natural spawning. Therefore, only in very rare instances are adult salmon expected to reach the project dams. Regardless, even if salmon were permitted to freely migrate upstream, runs of salmon will not be large enough to affect the design of fishways at any of the project dams. The more numerous species (shad and river herring) typically determine the kind of fish passage that should be built at a hydroelectric project.

(3) American eel:

American eels are currently present in the area occupied by the three project developments, although problems with upstream migration past the downstream dams and the lack of upstream passage at the project dams restrict the numbers of eels in the project area or areas upstream from the project. While the Department does not have a precise estimate of the numbers of eels that would be expected to use fish passage at the project developments, upstream and downstream passage would enhance the eel stocks and help achieve overall management goals. In addition, upstream passage needs for eels differ from those of salmon, shad, and river herring. Separate upstream eel fishways typically are installed at barriers in addition to those that are provided for anadromous fish.

(4) Other species:

Fish passage facilities provided at the project dams would also be used by white sucker, trout, and other riverine species. The numbers of riverine fish using the fishways are, however, likely to be small, relative to anadromous and catadromous species.

c. Upstream fishways at Amoskeag shall be operational during the designated migration period at river flows up to 19,400 cfs as measured at the USGS gage at Goffs Falls (#01092000). Fishways at Hooksett and Garvins Falls shall be operational at river flows of up to 19,000 and 17,000 cfs respectively, based on the Goffs Falls gage prorated as appropriate for drainage area differences between the gage location and these dams.

Downstream fishways shall be operated during the designated migration periods whenever turbines are operated at the three project developments.

d. Scheduling

The timing of installation of upstream fish passage at Hooksett and Garvins Falls will be based upon the growth of migratory and riverine fish populations in the Merrimack River. American eels are currently present in the river, and would benefit from the immediate implementation of safe, timely, and effective upstream and downstream eel fishways. The Commission's EA also recommends permanent upstream eel fishways at all three developments.

A fishway must be installed at Hooksett Dam within three years after 9,500 shad or 22,500 river herring pass Amoskeag. A fishway at Garvins Falls must be installed within three years after passage of 9,800 shad or 23,200 river herring at Hooksett Dam, or passage of 19,300 shad or 45,800 herring at Amoskeag Dam if the Hooksett fishway design does not permit counting of fish.

Installation of eelways now at all three dams would be a benefit to the species. However, proper eelway construction at the Amoskeag spillway and at Garvins Falls will require some initial study to assess proper eelway location. At all three dams, assessment of eelway location and design using interim eelways will also be needed prior to permanent eelway installation. Interim eelways shall be fully operational at Hooksett during the second spring/summer period after licensing, and at the Amoskeag spillway and at Garvins Falls within three spring/summer periods after license issuance. Following assessment and design, permanent eelways shall be installed and operational by the spring/summer of 2012.

e. The timely installation of the prescribed fishway structures, facilities, or devices is a measure directly related to those structures, facilities, or devices and is necessary to ensure the effectiveness of such structures, facilities, or devices. Therefore, the Department's Prescription includes the express requirement that the licensee (1) notify, and (2) obtain approval from the Service for any extensions of time to comply with the provisions included in the Department's Prescriptions for fishways.

f. Timing of Seasonal Fishway Operations:

Fishways shall be maintained and operated, at the licensee's expense, to maximize fish passage effectiveness throughout the upstream and downstream migration periods for American shad, river herring, American eel and white sucker:

Upstream passage: April 1 to July 15 -- All species except American eel
April 1 to Nov. 15 -- American eel

Downstream passage: April to June 15 -- Atlantic salmon
June 1 to July 15 -- Spent adults of all species
Sept. 15 to Nov. 15 -- Adult eel, juvenile shad & herring

Upon mutual agreement, the Licensee and the Service may modify the above schedules in the event that upstream or downstream passage of fish has not yet begun, migration has substantially declined, or operating conditions (i.e. high flows, drought) or other conditions make continued operation of the fishways unnecessary or inappropriate under the circumstances. If monitoring indicates that these dates should be permanently adjusted, the Service shall use its reservation of authority to modify the operating schedule.

g. The licensee shall keep the fishways in proper order and shall keep fishway areas clear of trash, logs, and material that would hinder passage. Anticipated maintenance shall be performed sufficiently before a migratory period such that fishways can be tested and inspected, and will operate effectively prior to and during the migratory periods.

h. Evaluation of Fish Passage Facilities

The licensee shall develop plans for and conduct fishway effectiveness evaluations on all prescribed fish passage, in consultation with the Service and other fishery agencies. For each fishway to be constructed, the plans for fishway effectiveness evaluations shall be submitted to the Service for final review and approval simultaneously with the construction plans and schedule for each fishway. Each plan shall include proposed evaluation methods, and schedules for conducting the study and providing the results to the Service and the Commission. If the Service and the licensee cannot agree on the evaluation plan, the licensee shall submit the proposed plan to the Commission for approval, including all comments received from the Service.

i. The licensee shall provide personnel of the Service, and other Service-designated representatives, access to the project site and to pertinent project records for the purpose of inspecting the fishways to determine compliance with the fishway Prescriptions.

j. The licensee shall develop in consultation with and submit for approval by the Service, all functional and final design plans, construction schedules, and any hydraulic model studies for the fishways or modifications to existing fishways described herein.

10.2 Specific Prescriptions for the Merrimack River Projects

10.2.1 Amoskeag

- a. The licensee shall operate the existing tailrace pool-and-weir fish ladder according to the upstream passage operation schedule (Section 10.1 f).
As noted in Section 10.1 f, exact operation dates in any given year can be adjusted depending on the timing of fish migrations in that year.

- b. The licensee shall operate the existing downstream fish bypass facility according to the passage operation schedule (Section 10.1 f).

- c. The licensee shall evaluate the effectiveness of the existing upstream tailrace fishway in passing American shad and river herring that reach the project. Within six (6) months from the date of issuance of the license, the licensee shall submit to the Service for review and approval, a proposed evaluation plan and a schedule for the evaluation. The plan shall include proposed methods of capture, tagging and monitoring fish, and provisions for filing results with the Service. Upon approval by the Service, the licensee shall submit the plan to the Commission for approval.
The licensee shall conduct the evaluation and file the results with the Service according to the approved schedule. Following review of the results of the evaluation and consultation between the licensee and the Service, any modifications to the fishways or additional evaluations shall be submitted for review and approval by the Service and subsequently filed with the Commission for approval. If agreement cannot be reached between the Service and the licensee concerning any modifications to the fishways or additional evaluations, the Service may require modifications to the fishway and/or additional evaluations pursuant to FPA § 18, or submit the matter to the Commission for approval.

- d. The licensee shall evaluate the effectiveness of the existing downstream passage facility for passing American shad, river herring and American eels. Within six (6) months from the date of issuance of the license, the licensee shall submit to the Service for review and approval, a proposed evaluation plan and a schedule for the evaluation. The plan shall include proposed methods of capture, tagging and monitoring fish, and provisions for filing results with the Service. Upon approval by the Service, the licensee shall submit the plan to the Commission for approval.
The licensee shall conduct the evaluation and file the results with the Service according to the approved schedule. Following review of the results of the evaluation and consultation, any modifications or additional evaluations shall be submitted for review and approval by the Service and subsequently filed with the Commission for approval. If agreement cannot be reached between the Service and the licensee concerning any modifications or additional evaluations, the Service may require modifications to the fishway and/or additional evaluations pursuant to FPA § 18, or submit the matter to the Commission for approval.

e. Within 24 months from the date of issuance of the license, the licensee shall, after consultation with the Service on eel fishway design and evaluation, submit to the Service for review and approval: 1) design plans for an interim spillway eel fishway and a schedule for its installation; and 2) a proposed evaluation plan and a schedule for the evaluation(s) of the interim eel fishways (i.e., the existing tailrace facility and the new spillway facility). The evaluation plan shall include proposed methods of capture, tagging and monitoring fish, and provisions for filing results with the Service. Upon approval by the Service, the licensee shall submit the plans to the Commission for approval. The licensee shall install the eel fishway and conduct the evaluation(s) and file the results with the Service and the Commission according to the approved schedule.

f. Within 120 days after the date of submission of the evaluation results for the interim eel fishways to the Commission, the licensee shall, after consultation with the Service on eel fishway design, submit to the Service for review and approval, plans for permanent eel fishway(s) and a schedule for completion of installation of the permanent eel fishway(s) by the 2012 spring/summer passage season. The number, design and siting of permanent eel fishway(s) will be based on the interim eel fishway evaluations and will be developed in consultation with and approved by the Service. Upon approval by the Service, the licensee shall submit the plan to the Commission for approval. The eel fishway(s) shall be installed according to the approved schedule.

10.2.2 Hooksett

a. The licensee shall operate the existing downstream fish bypass facility according to the passage operation schedule. (Section 10.1 f)

b. The license shall install upstream passage facilities for anadromous fish at the Hooksett Dam, to be operational within three years after passage of either 9,500 or more shad or 22,500 or more river herring in any given year at the Amoskeag development. Within one (1) year after passage of the trigger number of fish at Amoskeag, the licensee shall file design drawings and a construction schedule for the fishway with the Service and obtain approval of the Service for any such fish passage design drawings and construction schedule. Upon approval by the Service, the licensee shall submit the plan to the Commission for approval.

The permanent upstream passage facilities shall consist of(1) a 4-foot-wide Denil fishway on the west side of the project spillway, including a counting facility and measures for the provision of the necessary attraction water; or (2) an alternative design approved by the Service.

c. Within nine (9) months from the date of issuance of the license, the licensee shall, after consultation with the Service on eel fishway design and evaluation, submit to the Service

for review and approval: 1) design plans for an interim eel fishway and a schedule for its installation; and 2) a proposed evaluation plan and a schedule for the evaluation of the interim eel fishway(s). The evaluation plan shall include proposed methods of capture, tagging and monitoring fish, and provisions for filing results with the Service. Upon approval by the Service, the licensee shall submit the plans to the Commission for approval. The licensee shall install the eel fishway and conduct the evaluation(s) and file the results with the Service and the Commission according to the approved schedule.

d. Within 120 days after the date of submission of the evaluation results for the interim eel fishways to the Commission, the licensee shall, after consultation with the Service on eel fishway design, submit to the Service for review and approval, plans for permanent eel fishway(s) and a schedule for completion of installation by the 2012 spring/summer passage season. The number, design and siting of permanent eel fishway(s) will be based on the interim eel fishway evaluations and will be developed in consultation with and approved by the Service. Upon approval by the Service, the licensee shall submit the plan to the Commission for approval. The eel fishway(s) shall be installed according to the approved schedule.

e. The licensee shall evaluate the effectiveness of the existing downstream passage facility for passing American shad, river herring and American eels. Within six (6) months from the date of issuance of the license, the licensee shall submit to the Service for review and approval, a proposed evaluation plan and a schedule for the evaluation. The plan shall include proposed methods of capture, tagging and monitoring fish, and provisions for filing results with the Service. Upon approval by the Service, the licensee shall submit the plan to the Commission for approval.

The licensee shall conduct the evaluation and file the results with the Service according to the approved schedule. Following review of the results of the evaluation and consultation, any modifications or additional evaluations shall be submitted for review and approval by the Service and subsequently filed with the Commission for approval. If agreement cannot be reached between the Service and the licensee concerning any modifications or additional evaluations, the Service may require modifications to the fishway and/or additional evaluations pursuant to FPA § 18, or submit the matter to the Commission for approval.

10.2.3 Garvins Falls

a. The licensee shall operate the existing downstream fish bypass facility according to the passage operation schedule (Section 10.1 f) .

b. The license shall install upstream passage facilities at the Garvins Falls Dam for anadromous fish, to be operational within three years after the trigger number of fish is

reached. The trigger number shall be:

- (1) passage of either 9,800 American shad or 23,200 river herring at the Hooksett development;
- (2) if fish passage has been constructed at the Hooksett Development without a fish counting facility, passage of either 19,300 American shad or 45,800 river herring at the Amoskeag Development.

Within one (1) year after passage of the trigger number of fish, the licensee shall file design drawings and a construction schedule for the fishway with the Service and obtain approval of the Service for any such fish passage design drawings and construction schedule. Upon approval by the Service, the licensee shall submit the plan to the Commission for approval.

The upstream fishway at the Garvins Falls development shall consist of either (1) an upstream fish lift located adjacent to the discharge of the older, river-side powerhouse, with an exit flume to convey fish to the headpond as depicted in Conceptual Design Drawings 19 through 24; or (2) an alternative design and/or location approved by the Service.

c. The licensee shall evaluate the effectiveness of the existing downstream passage facility for passing American shad, river herring and American eels. Within six (6) months from the date of issuance of the license, the licensee shall submit to the Service for review and approval, a proposed evaluation plan and a schedule for the evaluation. The plan shall include proposed methods of capture, tagging and monitoring fish, and provisions for filing results with the Service. Upon approval by the Service, the licensee shall submit the plan to the Commission for approval.

The licensee shall conduct the evaluation and file the results with the Service according to the approved schedule. Following review of the results of the evaluation and consultation, any modifications or additional evaluations shall be submitted for review and approval by the Service and subsequently filed with the Commission for approval. If agreement cannot be reached between the Service and the licensee concerning any modifications or additional evaluations, the Service may require modifications to the fishway and/or additional evaluations pursuant to FPA § 18, or submit the matter to the Commission for approval.

d. Within 24 months from the date of issuance of the license, the licensee shall, after consultation with the Service on eel fishway design and evaluation, submit to the Service for review and approval: 1) design plans for an interim eel fishway(s) and a schedule for installation; and 2) a proposed evaluation plan and a schedule for the evaluation(s) of the interim eel fishway(s). The evaluation plan shall include proposed methods of capture, tagging and monitoring fish, and provisions for filing results with the Service. Upon

approval by the Service, the licensee shall submit the plans to the Commission for approval. The licensee shall install the eel fishway and conduct the evaluation(s) and file the results with the Service and the Commission according to the approved schedule.

e. Within 120 days after the date of submission of the evaluation results for the interim eel fishways to the Commission, the licensee shall, after consultation with the Service on eel fishway design, submit to the Service for review and approval, plans for permanent eel fishway(s) and a schedule for completion of installation by the 2012 spring/summer passage season. The number, design and siting of permanent eel fishway(s) will be based on the interim eel fishway evaluations and will be developed in consultation with and approved by the Service. Upon approval by the Service, the licensee shall submit the plan to the Commission for approval. The eel fishway(s) shall be installed according to the approved schedule.