165 FERC ¶ 62,031
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Energy Northwest Project No. 2244-022

ORDER ISSUING NEW LICENSE

(Issued October 11, 2018)

INTRODUCTION

1. On February 25, 2008, Energy Northwest filed, pursuant to sections 4(e) and 15 of the Federal Power Act (FPA),[1] an application for a new license to continue operating and maintaining the Packwood Lake Hydroelectric Project No. 2244 (Packwood Lake Project). The 26.125-megawatt (MW) project is located on Lake Creek, a tributary to the Cowlitz River, in Lewis County, southwestern Washington near the unincorporated town of Packwood. The project occupies 511.65 acres of federal land within the Gifford Pinchot National Forest and Goat Rocks Wilderness,[2] administered by the U.S. Department of Agriculture, Forest Service (Forest Service).[3]

2. As discussed below, this order issues a new license for the project.

[1] 16 U.S.C. §§ 797(e) and 808 (2012).

[2] The 108,023-acre Goat Rocks Wilderness is located along the shoreline of the southern portion of Packwood Lake. Section 4(c) of the Wilderness Act, 16 U.S.C. § 1133 (2012), prohibits commercial enterprise, structure, or installation within designated wilderness areas, unless authorized by the President. The Commission has interpreted the Wilderness Act as prohibiting the issuance of licenses authorizing the construction or operation of project works located within designated wilderness areas. Because wilderness area land was included in the project boundary under the original license, prior to designation of the Goat Rocks Wilderness, and Energy Northwest is not proposing construction on or addition inundation of these lands, relicensing the project is consistent with the Wilderness Act. *See PPL Montana*, 121 FERC ¶ 62,198 at P14, n.10 (2012).

[3] Because the project occupies federal land, section 23(b)(1) of the FPA, 16 U.S.C. § 817 (2012), requires that it be licensed.

BACKGROUND

3. The Commission issued the current license for the project on July 7, 1960, which expired on February 28, 2010.[4] Since then, Energy Northwest has operated the project under an annual license pending disposition of its new license application.

4. On June 19, 2008, the Commission issued a public notice that was published in the *Federal Register* indicating that the application was ready for environmental analysis and setting August 18, 2008, as the deadline for filing comments, recommendations, terms and conditions, and prescriptions.[5] The Forest Service, U.S. Department of the Interior (Interior), National Marine Fisheries Service (NMFS), and Washington Department of Fish and Wildlife filed comments, recommendations, terms and conditions, and prescriptions.

5. On September 16, 2008, the Commission issued a public notice that the application was accepted for filing, which was published in the *Federal Register* and set November 17, 2008,[6] as the deadline for filing motions to intervene and protests.[7] The Forest Service, NMFS, Washington Department of Fish and Wildlife, and Washington Department of Ecology filed timely motions to intervene.[8] None of the intervenors oppose the project.

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[4] *See Washington Public Power Supply System*, 24 FPC 21 (1960). The original license was granted for a term of 50 years with an effective date of March 1, 1960. On August 13, 1999, Washington Public Power Supply System changed its name to Energy Northwest. *Washington Public Power Supply System and Energy Northwest*, 88 FERC ¶ 62,133 (1999).

[5] 73 Fed. Reg. 36,310 (2008).

[6] The Commission's Rules of Practice and Procedure provide that if a filing deadline falls on a Saturday, Sunday, holiday, or other day when the Commission is closed for business, the filing deadline does not end until the close of business on the next business day. 18 C.F.R. § 385.2007(a)(2) (2018). Because the 60-day filing deadline fell on a Saturday (i.e., November 15, 2008), the filing deadline was extended until the close of business on Monday, November 17, 2008.

[7] 73 Fed. Reg. 54,793 (2008).

[8] Timely, unopposed motions to intervene are automatically granted by operation of Rule 214 of the Commission's Rules of Practice and Procedure. 18 C.F.R. § 385.214(c) (2018).

6. On February 5, 2009, Commission staff issued a draft environmental assessment (EA), analyzing the effects of the proposed project and alternatives to it, and setting a deadline for comments of March 9, 2009.[9] The Washington Department of Ecology, Washington Department of Fish and Wildlife, Forest Service, and Energy Northwest filed comments on the draft EA. In addition, Commission staff accepted comments on the draft EA at a meeting held on April 27, 2009, in Olympia, Washington. Commission staff considered all written and verbal comments when preparing the final EA, which was issued on July 1, 2009.

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

PROJECT DESCRIPTION

A. Project Area

8. Packwood Lake, which has a drainage area of about 19.2 square miles, is located at the lower end of the upper Lake Creek valley just west of the crest of the Cascade Mountain range. A number of small streams flow into Packwood Lake, but the primary source of water is upper Lake Creek, which originates from the Packwood Glacier and adjacent snowfields on the flanks of Old Snowy Mountain, and flows northwest into Packwood Lake. Packwood Lake drains into lower Lake Creek, a tributary of the Cowlitz River.

9. On September 3, 1964, Congress passed the Wilderness Act, which added the Goat Rocks Wilderness to the new National Wilderness Preservation System. The issuance of the original license and construction of the Packwood Lake Project predates the Wilderness designation.[10] About three quarters of the Packwood Lake shoreline is located within the Goat Rocks Wilderness. Other than these portions of Packwood Lake, there are no existing or proposed project facilities located within the wilderness area.

[9] The Commission's Rules of Practice and Procedure provide that if a filing deadline falls on a Saturday, Sunday, holiday, or other day when the Commission is closed for business, the filing deadline does not end until the close of business on the next business day. 18 C.F.R. § 385.2007(a)(2) (2018). Because the 30-day filing deadline fell on a Saturday (i.e., March 7, 2009), the filing deadline was extended until the close of business on Monday, March 9, 2009.

[10] The Packwood Lake Project license was issued on July 7, 1960, with an effective date of March 1, 1960; project construction started in 1962 and commercial operation began in June 1964.

B. Project Facilities

10. The Packwood Lake Project consists of: (1) a 452-acre natural lake (Packwood Lake); (2) a 424-foot-long intake canal; (3) a 15-foot-high, 85-foot-long concrete dam with a stilling basin, all of which are located on Lake Creek about 5.3 miles upstream of the confluence with the Cowlitz River; (4) an intake building on Lake Creek adjacent to the dam; (5) a conveyance system of concrete pipe and tunnels about 4.1 miles long; (6) a 1.1-mile-long penstock; (7) a surge tank; (8) a powerhouse located adjacent to the Cowlitz River about 4 miles downstream of the confluence with Lake Creek and containing a 26.125-MW turbine generator; (9) a tailrace channel directing powerhouse outflows to the Cowlitz River; (10) a tailrace fish barrier; (11) a switchyard; and (12) a 1.5-mile-long, 69-kilovolt (kV) transmission line. A more detailed description of project facilities is found in Ordering Paragraph (B)(2).

11. There are no recreational facilities associated with the current license for the Packwood Lake Project. Existing, non-project recreational facilities in the vicinity include a paved parking lot for about 30 to 45 vehicles at the end of Snyder Road (Forest Service Road 1260) with a single vault toilet, both of which are outside the existing project boundary. The parking lot serves as the trailhead for Forest Service trails 74 and 78 which are used, in-part, by Energy Northwest to access certain project facilities.

12. In 2006, there were 43 informal, non-project dispersed recreational sites along the shoreline of Packwood Lake, 23 of which were within the Goat Rocks Wilderness, and 20 of which are within 100 feet of the water's edge. These sites are typically used for overnight camping and day use activities such as swimming, fishing, hiking, and picnicking. All but three of the identified dispersed recreational sites are along the northern and eastern shoreline of the lake and accessed by Forest Service trails 78 and 81.

C. Project Boundary

13. The current project boundary encloses 546 acres of land, including 511.65 acres of federal land, and all of the project facilities listed above. Energy Northwest proposes no changes to the current project boundary. As noted above, about three quarters of the Packwood Lake shoreline is within the Goat Rocks Wilderness, which encompasses the southern portion of the lake, extending south on both the east and west sides of the lake from a position approximately level with Agnes Island.

D. Current Project Operation

14. The project is controlled automatically from the project powerhouse and is operated according to current license conditions, water availability, and power contracts. The project generates about 92,000 megawatt-hours (MWh) annually. The current license conditions limit the times Energy Northwest can store and release water for

generation. Water diverted for project generation varies from a minimum of 19 cfs to a maximum to 225 cfs.

15. Seasonally, Energy Northwest operates Packwood Lake to store winter runoff and keep summer lake levels as constant as possible for aquatic and riparian habitat protection and recreational use enhancement. From May 1 through September 15, the project's generation is dictated by Article 37 of the license, which specifies that the lake level be held at elevation 2,857 feet above mean sea level (msl) plus or minus 0.5 foot unless conditions occur that are beyond the control of the licensee. From May 1 through September 15, the project generation flow is adjusted to match lake inflow to hold the lake elevation relatively constant. During dry periods with very low inflows, the project is sometimes shut down to maintain the required lake level.

16. After mid-September, the lake level is lowered by as much as 8 feet to a level no lower than elevation 2,849 feet msl. The 8 feet of storage allows the project to store reservoir inflow and release flows to maximize the value of power generation. When seasonal high runoff exceeds the project capacity and the available lake storage, as occasionally happens during fall and winter rain events and during snowmelt in the spring and early summer, the dam is overtopped (at elevation 2,858.5 feet msl) and excess runoff flows over the spillway and down Lake Creek to the Cowlitz River. In some years, no spill occurs. To protect resident and anadromous fish and other aquatic species, a year-round minimum flow of 3 cubic feet per second (cfs) is released over the dam to the 5.3-mile-long bypassed reach of Lake Creek.

17. Water exiting Packwood Lake through the intake canal is screened for fish and debris at the project intake structure by two removable 10-foot by 11-foot outer debris screens in front of two permanently mounted trashracks. Behind these screens and trashracks, water is further screened for fish and debris by a traveling fish screen with a 4-millimeter (mm) by 4-mm mesh before passing through the 5.2-mile-long water conveyance system to the powerhouse.

E. Proposed Project Operation and Environmental Measures

18. Energy Northwest proposes no increased capacity or new project facilities, other than those related to stream gage installation and recreational enhancements. Operational changes intended to enhance aquatic habitat include: (1) seasonal minimum flows in the bypassed reach ranging from 4 to 20 cfs; (2) limitations on ramping rates; (3) planned spill events to lower Lake Creek; (4) timing powerhouse shutdowns for annual maintenance to occur between August 15 and September 15; and (5) modifying the rule curve for operation of water levels in Packwood Lake to eliminate maximum lake water level restrictions.

19. Energy Northwest proposes to protect salmonids in the project area by: (1) developing an intake fish entrainment monitoring plan to determine whether physical

modifications to the project intake screens are needed to reduce entrainment and impingement; (2) maintaining and monitoring the tailrace barrier and, if needed, repair and modify this facility to ensure that it excludes federally listed salmonids from the tailrace without causing delay, injury, or mortality; and (3) inspecting the tailrace slough[11] of the Cowlitz River prior to the annual powerhouse shutdowns for adequate flow and rescuing fish, if needed, to protect them from stranding when flows from the project cease.

20. Energy Northwest proposes to enhance salmonid habitat affected by the project by: (1) providing gravel and woody debris recruitment stations in Lake Creek downstream of the dam; (2) developing a stream restoration and enhancement plan for the one-mile reach of lower Lake Creek located immediately upstream from its confluence with the Cowlitz River; and (3) rerouting Snyder Creek into Hall Creek downstream of the project tailrace to facilitate fish passage.[12]

21. Energy Northwest proposes to monitor aquatic habitat to ensure compliance with the conditions of this license and identify the need for corrective actions as follows: (1) monitor the rainbow trout population in the 1,464-foot reach of Lake Creek downstream of the dam to confirm that at least 30 adults are present; if not, the population would be supplemented with adult Packwood Lake rainbow trout; (2) monitor temperature at the confluence of the project tailrace and Cowlitz River under the licensed operating mode to ensure compliance with applicable water quality standards; if standards are not met, resource agencies would be consulted to identify corrective actions; and (3) install flow measurement equipment at the Lake Creek Road bridge to ensure compliance with any flow requirements specified in the new license.

22. Energy Northwest proposes to protect threatened, endangered, and sensitive species of plants and animals at the project by: (1) implementing the Rare Plant Management Plan filed with the Commission on June 6, 2008; (2) developing an integrated weed management plan; (3) developing a threatened, endangered, and sensitive species management plan; (4) documenting and reporting incidental bald eagle sightings; (5) implementing the Avian Protection Plan filed with the Commission on June 6, 2008; and (6) conducting surveys for northwestern salamander in the wetland complex at the

[11] The tailrace slough is a side channel of the Cowlitz River into which the project tailrace channel discharges flow.

[12] Snyder Creek currently passes through a 75-foot culvert under the project tailrace and joins Hall Creek immediately downstream of the tailrace crossing. The culvert can become blocked with large amounts of sediment, which impedes upstream and downstream fish migration.

upper end of Packwood Lake (Site B), and improve connectivity between Site B and the lake, if needed, to allow salamander movement during winter drawdown.

23. Energy Northwest proposes to protect and enhance recreational opportunities by implementing a Recreation Management Plan that includes a road maintenance plan, and protect cultural resources by implementing its Historic Properties Management Plan (HPMP).

24. To ensure coordinated actions among the various resource protection and enhancement plans, Energy Northwest proposes to develop a resource coordination plan that would include provisions for a fire prevention plan and an annual coordination meeting.

SUMMARY OF LICENSE REQUIREMENTS

25. This license, which authorizes 26.125 MW of renewable energy generation capacity, requires the proposed measures listed above and the conditions required by Washington Department of Ecology's water quality certification (Appendix A), the Forest Service's section 4(e) conditions (Appendix B), NMFS's section 18 fishway prescriptions (Appendix C), and the reasonable and prudent measures of NMFS's Biological Opinion (Appendix D). The license also requires certain staff-recommended modifications and additional measures described below. Combined, these measures will protect or enhance fish, wildlife, cultural, and recreation resources at the project.

26. To protect threatened, endangered, and sensitive species at the project, the license requires Energy Northwest to modify its proposed threatened, endangered, and sensitive species management plan to include provisions for: (1) conducting surveys and developing protection measures, as needed, for Oregon goldenaster, bald eagles, and northern spotted owls prior to any land-disturbing or in-water construction activities associated with the stream restoration activities along lower Lake Creek required by U.S. Forest Service condition 7; and (2) conducting surveys and developing protection measures, as needed, for special-status amphibians prior to any land-disturbing or in-water construction activities associated with the fish passage improvements on Snyder and Hall Creeks required by U.S. Forest Service condition 10.

27. To prevent the spread of noxious weeds as a result of implementing environmental measures in lower Lake Creek, Snyder Creek, and Hall Creek, the license requires Energy Northwest to modify its Integrated Weed Management Plan to include an expanded list of target species for weed control at specified sites.

28. To protect cultural and historic resources at the project, the license requires Energy Northwest to implement the HPMP filed on August 30, 2007, in accordance with the programmatic agreement (PA) executed for the project on October 26, 2009.

WATER QUALITY CERTIFICATION

29. Under section 401(a)(1) of the Clean Water Act,[13] 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 Clean Water Act provides that the certification must become a condition of any federal license that authorizes construction or operation of the project.[14]

30. On August 4, 2008, Energy Northwest applied to Washington Department of Ecology for water quality certification for the Packwood Lake Project, which Washington Department of Ecology received on August 8, 2008. On July 24, 2009, Washington Department of Ecology issued a certification for the project that includes 22 conditions, 16 of which are general or administrative in nature and not discussed further. The remaining six conditions, which are essentially the same as the recommendations made by staff in the final EA, require Energy Northwest to: (1) implement the Tailrace Water Temperature Monitoring and Enhancement Plan filed with the Commission on June 6, 2008, with the exception that monitoring will occur for 3 years rather than the 10 years specified in the plan (condition 4.5); (2) implement and monitor Energy Northwest's proposed instream flows (condition 5.1); (3) implement Energy Northwest's proposed ramping rates (condition 5.2); (4) implement Energy Northwest's proposed habitat forming flows (condition 5.3); (5) develop a water quality protection plan, a stormwater pollution prevention plan, and an in-water work protection plan that includes best management practices and water quality monitoring provisions (condition 5.4); and (6) adhere to specified general oil spill prevention and control conditions (condition 5.5).

31. The 22 conditions of the certification are set forth in Appendix A of this order and incorporated into this license by Ordering Paragraph (D). Article 401 requires the licensee to file, for Commission approval, certain plans required by the certification conditions, as appropriate.

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[13] 33 U.S.C. § 1341(a)(1) (2012).

[14] 33 U.S.C. § 1341(d) (2012).

COASTAL ZONE MANAGEMENT ACT

32. 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's CZMA agency concurs with the license applicant's certification of consistency with the state's Coastal Zone Management Act program, or the agency's concurrence is conclusively presumed by its failure to act within 6 months of its receipt of the applicant's certification.

33. Washington Department of Ecology manages Washington's Coastal Zone Management Program. Washington's coastal zone boundary encompasses all lands and waters in the state's 15 coastal counties, and extends from the shoreline seaward three nautical miles.

34. Pursuant to the National Oceanic and Atmospheric Administration's regulations implementing the CZMA,[16] if a state chooses to review activities, with reasonably foreseeable effects, outside its coastal zone, it must generally describe the geographic location of such activities. If a state wishes to review activities outside of the coastal zone, and for which it has not generally described the geographic location for review, the state must follow the procedures established in 15 C.F.R. § 930.54 (2018). That section requires the state to notify the federal agency, the applicant, and the National Oceanic and Atmospheric Administration of unlisted activities affecting the coastal zone (that it wishes to review) within 30 days from notice of the license application.[17]

35. The Packwood Lake Hydroelectric Project is located outside of Washington's coastal zone, and Washington has not described a geographic location for federal license activities outside the coastal zone that it wishes to review. Notice of the license application was published in the Federal Register on March 7, 2008. In addition, Washington Department of Ecology was provided with a copy of the February 2009 draft EA and July 2009 final EA. The agency did not notify the Commission or the applicant that it wished to review the application. Therefore, certification is not required.

[15] 16 U.S.C. §1456(c)(3)(A) (2012).

[16] 15 C.F.R. § 930.53 (2018).

[17] Notice may be constructive, if it is published in the Federal Register. 15 C.F.R. § 930.54(a)(2) (2018).

SECTION 4(e) OF THE FPA

36. Section 4(e) of the FPA[18] provides that the Commission can issue a license for a project located within a federal reservation only if it finds that the license will not interfere or be inconsistent with the purpose for which the reservation was created or acquired. As noted above, the Packwood Lake Project occupies land within the Gifford Pinchot National Forest.

37. Commission staff reviewed the Organic Administration Act of 1897,[19] which established the purposes for forest reservations, and the presidential proclamation that created the Gifford Pinchot National Forest.[20] There is no evidence or allegation in this proceeding to indicate that relicensing the Packwood Lake Hydroelectric Project would interfere with the purposes of the Gifford Pinchot National Forest, within which the project is located. Therefore, this license, as conditioned, will not interfere or be inconsistent with the purposes for which the Gifford Pinchot National Forest was created.

38. FPA section 4(e) further requires that Commission licenses for projects located within federal reservations include conditions that the Secretary of the department under whose supervision the reservation falls shall deem necessary for the adequate protection and utilization of such reservation.

39. The Forest Service filed 19 preliminary 4(e) conditions on August 16, 2008, and filed a modification to its preliminary 4(e) condition 9 on March 6, 2009. Although the Forest Service noted in its March 6, 2009 letter its intent to file final 4(e) conditions following the issuance of the final EA, in a subsequent letter filed on May 19, 2009, the Forest Service stated that its preliminary 4(e) conditions filed on August 16, 2008, and modified on March 6, 2009, provide for the protection and utilization of the reservation and should be considered final. These final 4(e) conditions are set forth in Appendix B of this order and incorporated into this license by Ordering Paragraph (E).

40. Conditions 1 and 19 are administrative in nature and are not discussed further. The remaining conditions, which are generally consistent with Energy Northwest's

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[18] 16 U.S.C. § 797(e) (2012).

[19] 16 U.S.C. § 473 *et seq.* (2012).

[20] The Gifford Pinchot National Forest was originally established as the Mount Rainier Forest Reserve by Presidential Proclamation on February 22, 1897, 29 Stat 898. It was renamed Gifford Pinchot National Forest in 1949. Section 4(e) of the FPA, 16 U.S.C. § 797(e) (2012), authorizes the Commission to issue licenses for projects located on reservations of the United States, and section 3(2) of the FPA, 16 U.S.C. § 796(2) (2012), defines reservations as including national forests.

proposed environmental measures, require: (1) a resource coordination plan (condition 2); (2) a fire prevention plan (condition 3); (3) minimum water surface elevations in Packwood Lake of 2,856.5 feet from May 1 through September 15 and 2,849 feet from September 16 through April 30 and annual project maintenance to only occur between August 15 and September 15 (condition 4); (4) seasonal instream flows downstream to lower Lake Creek ranging from 4 to 20 cfs (condition 5); (5) aquatic habitat forming flow releases in lower Lake Creek (condition 6); (6) lower Lake Creek stream restoration and monitoring (condition 7); (7) rainbow trout surveys and supplementation in the upper reach of lower Lake Creek (condition 8); (8) measures to address entrainment and impingement at the project intake (condition 9); (9) improved fish passage for Snyder Creek (condition 10); (10) amphibian monitoring at Site B near Packwood Lake (condition 11);[21] (11) implementation of a threatened, endangered, and sensitive species management plan (condition 12); (12) a Packwood Lake tributary head-cutting monitoring program (condition 13); (13) the provisions of the Recreation Management Plan filed with the Commission on June 6, 2008 (condition 14); (15) pipeline, surge tank, and penstock monitoring (condition 15); (15) the Integrated Weed Management Plan filed with the Commission on June 6, 2008 (condition 16); (16) the Avian Protection Plan filed with the Commission on June 6, 2008 (condition 17); and (17) the HPMP filed with the Commission on August 30, 2007 (condition 18).

41. Forest Service condition 14, which requires the implementation of the proposed Recreation Management Plan and any approved revisions of that plan throughout the term of the license, is consistent with the Commission staff's recommendation in the final EA with the exceptions discussed below.

42. The proposed trail maintenance measures specified in the Recreation Management Plan include funding a Forest Service seasonal employee. In the final EA,[22] staff noted that the funding of a Forest Service seasonal employee is not a project-related action or the responsibility of a project licensee. The Commission has no way of ensuring that the hiring of personnel by the Forest Service but paid for by the licensee would accomplish a project-related purpose.[23] Therefore, Commission staff did not recommend that the measure be included as a license condition. Nevertheless, the funding of a Forest Service

[21] Site B is the portion of a wetland complex located at the upper end of Packwood Lake nearest the lake.

[22] Final EA at 171.

[23] Policy Statement on Hydropower Licensing Settlements, Docket No. PL06-5-000, issued on September 21, 2006.

seasonal employee specified in condition 14 is included in the license because it is mandatory under section 4(e) of the FPA.

43. The Recreation Management Plan contains a provision for the licensee to continue to provide power to an existing Forest Service guard station. In the final EA,[24] staff determined that, because the guard station pre-existed the Packwood Lake Hydroelectric Project and Packwood Lake is a natural lake, the presence of the guard station is not a result of the Packwood Lake Hydroelectric Project and has no connection to the project. Further, it is not the Commission's policy to require specific allocation of power from licensed projects, but leaves those matters to private contract, and as appropriate, state regulation.[25] Nevertheless, the allocation of project power to the Forest Service guard station specified in condition 14 is included in the license because it is mandatory under section 4(e) of the FPA.

44. In addition, the Recreation Management Plan specifies that Energy Northwest be responsible for a share of the maintenance of 4.3 miles of Snyder Road (Forest Service Road 1260). In the final EA,[26] staff concluded that use of Snyder Road by the public for recreational access to the National Forest constitutes nearly all of the use of this road and that the road is used only incidentally for project-related purposes. Therefore, staff did not recommend that Energy Northwest have any responsibility for maintaining the road as a condition of the license. Nevertheless, the shared maintenance of Snyder Road specified in condition 14 is included in the license because it is mandatory under section 4(e) of the FPA.

45. Forest Service condition 15 requires Energy Northwest to develop a monitoring plan for the project's pipeline, surge tank, and penstock to protect Forest Service land from leakage or failure of these facilities. In the final EA,[27] staff noted that this

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[24] Final EA at 27.

[25] "It has . . . been the practice of this Commission and the predecessor Federal Power Commission (FPC) since the issuance of licenses began in 1920 to leave the disposition of project power in the hands of the licensee, which is responsible for the construction, operation, and maintenance of the project, unless Congress has made a legislative directive to the contrary." *Power Authority of the State of New York; Massachusetts Municipal Wholesale Electric Company v. Power Authority of the State of New York*, 109 FERC ¶ 61,092 (2004). *See New York Power Authority*, 118 FERC ¶ 61,206 at P 73 n.73 (2007).

[26] Final EA at 221-222.

[27] Final EA at B-11.

requirement is redundant with the Commission's Division of Dam Safety and Inspections (D2SI) monitoring requirements for the project. Energy Northwest's Dam Safety Surveillance and Monitoring Plan for the project includes weekly inspections of the pipeline, surge tank, and penstock and requires that conditions affecting the safety of the project or project works be reported to the Commission's Portland Regional Office as soon as practicable. In addition, D2SI conducts a dam safety inspection of the project at least every three years. Although the development of an additional plan to monitor the project's pipeline, surge tank, and penstock specified in condition 15 is redundant and unnecessary, it is included in the license because it is mandatory under section 4(e) of the FPA.

SECTION 18 FISHWAY PRESCRIPTIONS

46. Section 18 of the FPA[28] 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.

47. On August 19, 2008, NMFS, representing the Secretary of Commerce, filed a fishway prescription for the project that requires Energy Northwest to: (1) maintain, test, and operate the fish screen at the project tailrace outlet as described in the incidental take statement of the biological opinion on construction, post-construction monitoring, and evaluation of a tailrace barrier at the project;[29] and (2) develop and implement a plan to provide fish passage conditions at the tailrace channel crossing of Snyder Creek that meet NMFS standards within 2 years of license issuance. NMFS's prescription is attached to this order as Appendix C and incorporated into the license by Ordering Paragraph (F). NMFS's biological opinion, which is discussed below, attached to this order as Appendix B, and incorporated in the license by Ordering Paragraph (G), requires the submission of a report to NMFS documenting the completion of the Snyder Creek culvert replacement project.

48. In addition to its prescription, NMFS requested that the Commission reserve authority to prescribe additional or modified fishways. Consistent with Commission policy, Article 402 of this license reserves the Commission's authority to require

[28] 16 U.S.C. § 811 (2012).

[29] Energy Northwest constructed a fish screen facility to exclude fish from the project tailrace and stilling basin in the fall of 2007. *Energy Northwest*, 120 FERC ¶ 62,218 (2007) (Order Modifying and Approving Application for Amendment of License).

additional or modified fishways that may be prescribed by NMFS for the Packwood Lake Hydroelectric Project.

ESSENTIAL FISH HABITAT

49. Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act,[30] requires federal agencies to consult with the Secretary of Commerce regarding any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH) identified under the Act. Under section 305(b)(4)(A) of the Magnuson-Stevens Act, NMFS is required to provide EFH Conservation Recommendations for actions that would adversely affect EFH.[31] Under section 305(b)(4)(B) of the Act, an agency must, within 30 days after receiving recommended conservation measures from NMFS or a Regional Fishery Management Council, describe the measures proposed by the agency for avoiding, mitigating, or offsetting the effects of the agency's activity on the EFH.[32]

50. The Packwood Lake Hydroelectric Project area includes habitat that has been designated as EFH for various life-history stages of Chinook and coho salmon. By letter issued on February 5, 2009, Commission staff informed NMFS of staff's conclusion that licensing the project, with staff's recommended measures, may adversely affect EFH. With the same letter, Commission staff initiated EFH consultation with NMFS. As discussed below, NMFS issued a biological opinion for these species on March 22, 2018. NMFS has adopted the reasonable and prudent measures identified in the incidental take statement of the biological opinion as the EFH conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on essential fish habitat. NMFS's reasonable and prudent measures are set forth in Appendix D of this order and incorporated into the license by Ordering Paragraph (F).

THREATENED AND ENDANGERED SPECIES

51. Section 7(a)(2) of the Endangered Species Act of 1973[33] (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of

[30] 16 U.S.C § 1855(b)(2) (2012).

[31] 16 U.S.C § 1855(b)(4)(A) (2012).

[32] 16 U.S.C § 1855(b)(4(B) (2012). The measures recommended by the Secretary of Commerce are advisory, not prescriptive. However, if the federal agency does not agree with the recommendation of the Secretary of Commerce, the agency must explain its reasons for not following the recommendations. *Id.*

[33] 16 U.S.C. § 1536(a) (2012).

federally listed threatened and endangered species, or result in the destruction or adverse modification of designated critical habitat.

52. There are 13 listed species known to occur, or that potentially occur, in the vicinity of the project that Commission staff evaluated for potential effects of relicensing in the final EA: (1) Chinook salmon (*Oncorhynchus tshawytscha*), (2) coho salmon (*Oncorhynchus kisutch)*, (3) steelhead (*Oncorhynchus mykiss)*, (4) chum salmon (*Oncorhynchus keta)*, (5) bull trout (*Salvelinus confluentus*), (6) Canada lynx (*Lynx canadensis*), (7) grizzly bear (*Ursus arctos*), (8) gray wolf (*Canis lupus*), (9) marbled murrelet (*Brachyramphus marmoratus*), (10) northern spotted owl (*Strix occidentalis caurina*), (11) howellia (*Howellia aquatilis*), (12) Kincaid's sulfur lupine (*Lupinus sulphureus kincaidii*), and (13) Nelson's checker-mallow (*Sidalcea nelsoniana*).

53. On August 31, 2018, staff requested an updated list of threatened and endangered species potentially occurring in the vicinity of the project.[34] The updated list included two additional species, the threatened yellow-billed cuckoo (*Coccyzus americanus*, western distinct population segment) and the proposed as threatened North America wolverine (*Gulo gulo luscus*). Critical habitat is also proposed for the yellow-billed cuckoo, however none of the critical habitat occurs within the state of Washington.[35]

A. Chum Salmon, Bull Trout, Canada Lynx, Grizzly Bear, Gray Wolf, Marbled Murrelet, Howellia, Kincaid's Sulfur Lupine, and Nelson's Checker-mallow

54. In the final EA,[36] staff determined that the project would have no effect on chum salmon, bull trout, Canada lynx, grizzly bear, gray wolf, marbled murrelet, howellia, Kincaid's sulfur lupine, and Nelson's checker-mallow. These species are unlikely to occur in the project area because suitable habitat does not exist for these species or, in the case of the gray wolf, has not been documented in the project area, but if it should occur, it would avoid areas in proximity to project features. Therefore, no further action under the ESA is required for these species.

B. North American Wolverine

55. The North American wolverine is known to occur in the southern Cascades where the project is located. However, given the wolverine's extensive home range (100 square

[34] *See* FWS Information for Planning and Consultation report filed September 4, 2018.

[35] *Federal Register* Vol. 79, No. 150, August 15, 2014.

[36] Final EA at 140-154.

miles or more) and roving lifestyle, it likely would only intermittently traverse the project area for short durations, if at all. Further, because wolverines prefer high-elevation alpine habitats they are not likely to occur in the lower-elevation, forested habitats that surround project facilities or near Lower Lake Creek where stream restoration and enhancement measures will be implemented. We conclude that the project will have no effect on the North American wolverine and therefore no further action under ESA is required for the species.

C. Yellow-billed Cuckoo

56. Although suitable nesting habitat for the yellow-billed cuckoo exists in the project area, the last confirmed nest in the state of Washington was in 1923. Further, since the 1950s only 20 documented sightings of the yellow-billed cuckoo have been reported in the state of Washington and none in Lewis County. Because it is highly unlikely yellow-billed cuckoos occur, let alone breed, in the project area, we conclude that the project will have no effect on the yellow-billed cuckoo. No further action under ESA is required for the yellow-billed cuckoo.

D. Chinook Salmon and Steelhead

57. In the final EA,[37] staff determined that relicensing the project is likely to adversely affect Chinook and coho salmon and steelhead, and designated critical habitat for Chinook salmon and steelhead due to fish stranding in the tailrace slough during unplanned project shutdowns, handling mortality of these fish under any fish rescue efforts in the slough during such outages, and juvenile harm or mortality caused by in-habitat construction activities.[38] On February 5, 2009, staff issued a letter with an enclosed biological assessment requesting formal consultation with NMFS, as required by section 7 of the ESA. On March 22, 2018, NMFS issued a biological opinion that concluded that issuing a license for the project, as recommended by Commission staff, is not likely to jeopardize the continued existence of upper Cowlitz River stocks of Chinook and coho salmon and steelhead. As part of its biological opinion, NMFS included an incidental take statement with reasonable and prudent measures to minimize incidental take of these three species along with terms and conditions to implement the measures.

58. The NMFS's reasonable and prudent measures (RPM) and terms and conditions, set forth in Appendix D of this order and incorporated into the license by Ordering

[37] Final EA at 151.

[38] This license requires Energy Northwest to improve fish passage in Snyder creek by re-routing Snyder Creek to join Hall Creek immediately downstream of the project tailrace; improve the instream habitat conditions for fish in the lower 1.0 mile of Lake Creek; and install of a stream gage on lower Lake Creek.

Paragraph (G), require the licensee to implement the following measures, which are consistent with those proposed by Energy Northwest and recommended or required by the other agencies, to protect Chinook and coho salmon and steelhead and designated critical habitat for Chinook salmon and steelhead: (1) monitor and report on incidental take and habitat restoration and enhancement activities and their effectiveness; (2) avoid or minimize adverse effects to riparian and aquatic habitats during habitat restoration activities; (3) prevent stranding during project outages; (4) apply proper fish handling techniques; (5) maintain the fish screen and water quality in the tailrace; (6) provide minimum instream flows, ramping rates, channel forming flows, and flow monitoring in lower Lake Creek; (7) monitor fall-run Chinook in the project area; (8) implement the Tailrace Water Temperature Monitoring and Enhancement Plan as required by the water quality certification; and (9) develop a NMFS approved approach for the development of plans and reports.

59. We note that NMFS's reasonable and prudent measures also specify that following completion of the Snyder Creek culvert replacement project, the Commission will submit a report to the NMFS documenting the implementation of the action as proposed and compliance with the terms and conditions of the biological opinion. Article 401 requires the licensee to file the report with the NMFS and to concurrently file a copy of the report with the Commission.

E. Northern Spotted Owl

60. In the final EA,[39] staff concluded that relicensing the project is not likely to adversely affect the northern spotted owl. On February 5, 2009, staff issued a letter to FWS requesting their concurrence on the finding of not likely to adversely effect. FWS concurred with this finding by letter filed July 24, 2009.

NATIONAL HISTORIC PRESERVATION ACT

61. Under section 106 of the National Historic Preservation Act,[40] and its implementing regulations,[41] federal agencies must take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register of Historic Places (defined as historic properties) and 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

[39] Final EA at 152-154.

[40] Section 106 of the National Historic Preservation Act of 1966, as amended, 54 U.S.C. § 306108, Pub. L. No. 113-287, 128 Stat. 3188 (2014).

[41] 36 C.F.R. Part 800 (2018).

(SHPO) to determine whether and how a proposed action may affect historic properties, and to seek ways to avoid or minimize any adverse effects.

62. To satisfy these responsibilities, the Commission executed a Programmatic Agreement (PA) with the Washington SHPO on October 26, 2009, and invited Energy Northwest, Forest Service Gifford Pinchot National Forest, Cowlitz Indian Tribe, and Yakama Nation to concur with the stipulations of the PA. Energy Northwest, Gifford Pinchot National Forest, and the Cowlitz Tribe signed the PA as concurring parties. The PA requires Energy Northwest to implement the associated HPMP for the term of any new license issued for this project. Execution of the PA demonstrates the Commission's compliance with section 106 of the National Historic Preservation Act. Article 40 requires Energy Northwest to implement the PA and HPMP.

PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

63. In 1980, Congress enacted the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act).[42] This act created the Northwest Power Planning Council (now known as the Northwest Power and Conservation Council) and directed it to develop a Columbia River Basin Fish and Wildlife Program. The Program is to protect, mitigate, and enhance fish and wildlife resources affected by the development and operation of hydroelectric projects on the Columbia River and its tributaries, while assuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply.[43] Section 4(h)(11)(A) of the Northwest Power Act,[44] provides that federal agencies operating or regulating hydroelectric projects within the Columbia River Basin must exercise their responsibilities to provide equitable treatment for fish and wildlife resources with other purposes for which the river system is utilized and must take the Council's Program into account "at each relevant stage of decision-making processes to the fullest extent practicable."

64. To mitigate harm to fish and wildlife resources, the Council has adopted specific provisions to be considered in the licensing or relicensing of non-federal hydropower projects (Appendix B of the Columbia River Basin Fish and Wildlife Program). Measures included in this license are consistent with the applicable provisions of this Program, including: (1) minimum flows (Forest Service condition 5, certification condition 5.1, and RPM 6); (2) ramping rates (certification condition 5.2 and RPM 6); (3) adaptive entrainment and impingement plan (Forest Service condition 9); (4) annual

[42] 16 U.S.C. §§ 839b *et seq.* (2012).

[43] 16 U.S.C. § 839b(h)(5) (2012).

[44] 16 U.S.C. §839b(h)(11)(A) (2012).

maintenance timing (Forest Service condition 4 and RPM 3); (5) Lake Packwood water level management (Forest Service condition 4); (6) habitat forming flows to lower Lake Creek (Forest Service condition 6, certification condition 5.3, and RPM 6); (7) wood and gravel augmentation at lower Lake Creek (Forest Service condition 7 and RPM 2); (8) lower Lake Creek restoration and enhancement (Forest Service condition 7 and RPM 2); (9) rare species surveys prior to lower Lake Creek ground disturbance (Forest Service condition 12 and Article 403); (10) enhanced fish passage at Snyder Creek (Forest Service condition 10, NMFS prescription article 2, and RPM 2); (11) potential timing restrictions for construction at Snyder Creek to protect amphibians (Forest Service condition 12 and Article 402); (12) maintaining and monitoring the effectiveness of tailrace fish barrier (NMFS prescription article 1 and RPM 1); (13) water temperature monitoring at the confluence of the tailrace with Cowlitz River (certification condition 4.5 and RPM 8); (14) fish rescuing and handling (RPMs 1, 3 and 4); (15) threatened, endangered, and sensitive species management plan (Forest Service condition 12 and Article 402); and (16) surveys for salamanders at the upper end of Lake Packwood and, if needed, enhance connectivity of the habitat with the lake during winter drawdown (Forest Service condition 11). The Council has also designated more than 40,000 miles of river in the Pacific Northwest region as unsuitable for hydroelectric development (protected area). However, the project is not located within a protected area designated under the program. Further, Article 405 reserves to the Commission the authority to require future alterations in project structures and operation to take into account, to the fullest extent practicable, the applicable provisions of the program.

RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES PURSUANT TO SECTION 10(j) OF THE FPA

65. Section 10(j)(1) of the FPA,[45] requires the Commission, when issuing a license, to include conditions, based on recommendations submitted by federal and state fish and wildlife agencies pursuant to the Fish and Wildlife Coordination Act,[46] to "adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)" affected by the project.

66. In response to the June 19, 2008, public notice that the project was ready for environmental analysis, Washington Department of Fish and Wildlife and NMFS collectively filed 15 different recommendations under section 10(j).[47] Two recommendations are outside the scope of section 10(j), and are the same as Forest

[45] 16 U.S.C. § 803(j)(1) (2012).

[46] 16 U.S.C. §§ 661 (2012) *et seq*.

[47] Washington Department of Fish and Wildlife filed recommendations on August 18, 2008, and NMFS filed recommendations on August 19, 2008.

Service conditions 2 (resource coordination plan) and 15 (pipeline, surge tank, and penstock monitoring) discussed above. This license includes conditions consistent with 12 of the remaining 13 recommendations that are within the scope of section 10(j). These include recommendations to: (1) provide seasonal instream flows in Lake Creek ranging from 4 to 20 cfs (Forest Service condition 5 and certification condition 5.1); (2) maintain minimum water surface elevations in Packwood Lake of 2,856.5 feet from May 1 through September 15 and 2,849 feet from September 16 through April 30 (Forest Service condition 4); (3) begin the annual powerhouse shutdown for project maintenance on August 15 of each year (Forest Service condition 4); (4) release aquatic habitat forming flows to lower Lake Creek (Forest Service condition 6 and certification condition 5.3); (5) ensure a specified trout population in reach 5 of Lower Lake Creek, below the dam (Forest Service condition 8); (6) provide a gravel and wood recruitment station in reach 5 below the dam (Forest Service condition 7); (7) implement a stream restoration and enhancement plan for the lowest 1.0 mile of Lake Creek (Forest Service condition 7); (8) improve fish passage on Snyder Creek where it crossed the tailrace canal (Forest Service condition 10 and NMFS prescription article 2); (9) implement a threatened, endangered, and sensitive species management plan (Forest Service condition 12 and Article 403); (10) conduct amphibian monitoring in the wetland habitat at the head of Packwood Lake (Forest Service condition 11); (11) ensure that the project transmission line conforms to standards for raptor protection (Forest Service condition 17); and (12) implement a Packwood Lake tributary head-cutting monitoring plan (Forest Service condition 13).

67. If the Commission believes that any such recommendation may be inconsistent with the purposes and requirement of part 1 of the FPA or other applicable law, section 10(j)(2) 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.[48] If the Commission still does not adopt a recommendation, it must explain how the recommendation is inconsistent with Part 1 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.

68. Staff made an initial determination that Washington Department of Fish and Wildlife's recommendation to reduce entrainment at the project intake by modifying the existing fish screen to meet state approach velocity criteria 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 issued February 11, 2009, Commission staff advised Washington Department of Fish and Wildlife of its preliminary determination and attempted to resolve the apparent inconsistency. Washington Department of Fish and

[48] 16 U.S.C. § 803(j)(2) (2012).

Wildlife responded by letter filed March 4, 2009. A meeting was held on April 27, 2009, to try to resolve the inconsistency, but no resolution could be reached.

69. In the final EA,[49] staff determined that the population of rainbow trout in Packwood Lake appears viable and healthy under existing conditions and that the proportion of these rainbow trout exposed to entrainment and impingement risk in any given year is relatively small, representing less than 1 percent of the total lake population. Therefore, staff concluded that the existing screens at the intake (stationary screens with traveling screens behind the stationary screens) provide adequate protection for these fish. For this reason, Washington Department of Fish and Wildlife's recommended modification to the existing fish screen would have minimal benefits to the fishery resource that would not justify its estimated $1.6 million capital cost.

70. This license requires Energy Northwest to maintain seasonal minimum water surface elevations in Packwood Lake and restrict the timing of annual project maintenance to only occur between August 15 and September 15 (Forest Service condition 4). The license also requires Energy Northwest to monitor the project intake and rainbow trout population in Packwood Lake to determine the need for additional measures to reduce entrainment/impingement at the project (Forest Service condition 9). These measures would protect the rainbow trout population and other aquatic resources in Packwood Lake during project operation.

71. For the above reasons, in accordance with FPA section 10(j)(2)(A), Washington Department of Fish and Wildlife's recommendation 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, the measures required by this license will adequately and equitably protect, mitigate damages to, and enhance fish and wildlife resources affected by this project.

SECTION 10(a)(1) OF THE FPA

72. Section 10(a)(1) of the FPA[50] requires that any project for which the Commission issues a license 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.

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[49] Final EA at 93-102.

[50] 16 U.S.C. § 803(a)(1) (2012).

A. Noxious Weed Management

73. In the final EA,[51] Commission staff recommended, consistent with what Forest Service condition 16 requires, that Energy Northwest implement its proposed Integrated Weed Management Plan filed with the Commission on June 6, 2008, which identifies management priorities for different zones within the project area based on such factors as weed class, risk to sensitive resources, distribution and abundance, and potential for eradication, containment, or control. However, staff noted that the plan does not identify Scotch broom, butterfly bush, Japanese knotweed, reed canarygrass, Himalayan Blackberry, or cutleaf blackberry as target species and recommended that the plan be modified to address the control of these species. Staff also recommended that the plan include control of these species in three additional areas: (1) near the tailrace where an existing population of Oregon goldenaster occurs; (2) areas associated with the stream restoration measures along lower Lake Creek required by Forest Service condition 7; and (3) areas associated with the fish passage improvements on Snyder and Hall Creeks required by Forest Service condition 10. Therefore, Article 404 requires Energy Northwest to file a revised Integrated Weed Management Plan that includes these additional target species and areas.

B. Threatened, Endangered, and Sensitive Species Management

74. In the final EA,[52] Commission staff recommended, consistent with what Energy Northwest proposes, Forest Service condition 12 requires, and Washington Department of Fish and Wildlife recommends, that Energy that Northwest develop a threatened, endangered, and sensitive species management plan. Staff recommended that the plan include provisions for: (1) an evaluation of the potential effects of unanticipated project-related activities on bald eagles and northern spotted owls; (2) surveys for Oregon goldenaster prior to any ground-disturbing activity associated with the stream restoration measures along lower Lake Creek; and (3) measures to protect amphibians during construction activities associated with fish passage improvements at Snyder and Hall Creeks. Upon further review, staff now concludes that the plan specified in Forest Service condition 12 would provide adequate protection for any potential effects of unanticipated project-related activities on bald eagles and northern spotted owls and no additional provision for such protection is needed. However, nesting bald eagles and northern spotted owls have the potential to be affected by the stream restoration activities in lower Lake Creek required by Forest Service condition 7. Therefore, Article 403 requires that the threatened, endangered, and sensitive species management plan required by Forest Service condition 12 include provisions to: (1) conduct surveys and develop

[51] Final EA at 217-219.

[52] Final EA at 219-220.

protection measures, as needed, for Oregon goldenaster, nesting bald eagle, and nesting northern spotted owl prior to any land-disturbing or in-water construction activities associated with the stream restoration activities along lower Lake Creek required by Forest Service condition 7; and (2) conduct surveys and develop protection measures, as needed, for special-status amphibians prior to any land-disturbing or in-water construction activities associated with the fish passage improvements on Snyder and Hall Creeks required by Forest Service condition 10.

ADMINISTRATIVE PROVISIONS

A. Annual Charges

75. The Commission collects annual charges from licensees for administration of the FPA and for compensation for the use and occupancy of federal land. Article 201 provides for the collection of these charges.

B. Exhibit F and G Drawings

76. The Commission requires licensees to file sets of approved project drawings in electronic file format. Article 202 requires the filing these drawings.

C. Headwater Benefits

77. Some projects directly benefit from headwater improvements that were constructed by other licensees, by the United States, or by permittees. Article 203 requires Energy Northwest to reimburse such entities for these benefits if they were not previously assessed and reimbursed.

D. Use and Occupancy of Project Lands and Waters

78. Requiring a licensee to obtain prior Commission approval for every use or occupancy of project land would be unduly burdensome; therefore, Article 407 allows Energy Northwest 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.

E. Modification of Project Facilities

79. Article 301 requires the licensee to coordinate with the Commission's Division of Dam Safety and Inspections – Portland Regional Office about any proposed modifications resulting from environmental requirements that would affect project works, dam safety, or operation.

F. Commission Approval of Resource Plans, Notification, and Filing of Amendments

80. In Appendices A, B, C, and D, there are certain certification conditions, 4(e) conditions, fishway prescriptions, and terms and conditions of NMFS's biological opinion that either do not require the licensee to file plans with the Commission, do not provide for consultation with the appropriate agencies during plan development, or contemplate non-specific and uncertain long-term changes to project facilities, operations, or license conditions. Therefore, Article 401 requires the licensee to consult with the other agencies during plan development and to file the plans with the Commission for approval, notify the Commission of planned and unplanned deviations from license requirements, and file amendment applications, as appropriate.

STATE AND FEDERAL COMPREHENSIVE PLANS

81. Section 10(a)(2)(A) of the FPA[53] requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project.[54] Under section 10(a)(2)(A), Commission staff identified 29 comprehensive plans that are relevant to this project.[55] No conflicts were found.

APPLICANT'S PLANS AND CAPABILITIES

82. In accordance with sections 10(a)(2)(C) and 15(a) of the FPA,[56] Commission staff evaluated Energy Northwest's record as a licensee for these areas: (A) conservation efforts; (B) compliance history and ability to comply with a new license; (C) safe management, operation, and maintenance of the project; (D) ability to provide efficient and reliable electric service; (E) need for power; (F) transmission services; (G) cost-effectiveness of plans; and (H) actions affecting the public. This order accepts staff's findings in each of the following areas.

[53] 16 U.S.C. § 803(a)(2)(A) (2012).

[54] Comprehensive plans for this purpose are defined at 18 C.F.R. § 2.19 (2018).

[55] The list of applicable plans can be found in section 5.5 (Consistency with Comprehensive Plans) of the final EA.

[56] 16 U.S.C. §§ 803(a)(2)(C) and 808(a) (2012).

A. Conservation Efforts

83. Section 10(a)(2)(C) of the FPA[57] requires the Commission to consider the applicant's electricity consumption improvement program, including its plans, performance, and capabilities for encouraging or assisting its customers to conserve electricity cost-effectively, taking into account the published policies, restrictions, and requirements of state regulatory authorities. Energy Northwest sells all project power to Lewis County Public Utility District, which is responsible for promoting conservation of electricity use by its customers. Given the limits of its ability to influence users of the electricity generated by the project, Energy Northwest complies with section 10(a)(2)(C) of the FPA.

B. Compliance History and Ability to Comply with New License

84. Based on a review of Energy Northwest's compliance with the terms and conditions of the existing license, Energy Northwest's overall record of making timely filings and compliance with its license is satisfactory. Therefore, Energy Northwest can satisfy the conditions of a new license.

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

85. Commission staff reviewed Energy Northwest's management, operation, and maintenance of the Packwood Lake Hydroelectric Project pursuant to the requirements of Part 12 of the Commission's regulations and the Commission's Engineering Guidelines. Staff concludes that the dams and other project works are safe and that there is no reason to believe that Energy Northwest cannot continue to safely manage, operate, and maintain these facilities under a new license.

D. Ability to Provide Efficient and Reliable Electric Service

86. Commission staff reviewed Energy Northwest's plans and its ability to operate and maintain the project in a manner most likely to provide efficient and reliable electric service. Staff's review indicates that Energy Northwest regularly inspects the project turbine generator units and the flow conduit to ensure they continue to perform in an optimal manner, schedules maintenance to minimize effects on energy production, and since the project has been in operation, has undertaken several initiatives to ensure the project is able to operate reliably into the future Therefore, Energy Northwest is capable of operating the project to provide efficient and reliable electric service in the future.

[57] 16 U.S.C. §§ 803(a)(2)(C) (2012).

E. Need for Power

87. To assess the need for power, staff looked at the needs in the operating region in which the project is located. The project is located in the Northwest Power Pool area of the Western Electricity Coordinating Council (WECC) region of the North American Electric Reliability Council. To anticipate how the demand for electricity is expected to change in the region, we reviewed the WECC' projected regional power needs. For the period from 2017 through 2026, WECC's 2016 Long-Term Reliability Assessment forecasts the need for over 4,000 MW of new power resources to maintain adequate capacity reserves in the assessment area. Therefore, the project's power will continue to meet part of the existing load requirements within a system in need of resources, help meet a need for power in the region, and contribute to a diversified generation mix.

F. Transmission Services

88. The project includes a 1.5-mile-long, 69 kV transmission line that connects to the Lewis County Public Utilities District's Packwood substation. Lewis County Public Utility District then transmits power to the Bonneville Power Administration federal transmission system at the Silver Creek substation in Lewis County. When Lewis County Public Utility District experiences an outage on its transmission line west of Packwood, it can isolate the Packwood area from the main transmission grid and request that the power generated by the Packwood Lake Hydroelectric Project be used to serve its customers. Thus, the project serves as an important backup source of electricity to the local communities. Energy Northwest proposes no changes that would affect its transmission facilities and the existing transmission services will continue under this license.

G. Cost Effectiveness of Plans

89. Energy Northwest proposes several operational changes and environmental measures and plans for the enhancement of fish and wildlife, recreation, and cultural resources at the project. Based on Energy Northwest's record as an existing licensee, staff concludes that these plans are likely to be carried out in a cost-effective manner.

H. Actions Affecting the Public

90. Energy Northwest provided opportunity for public involvement in the development of its application for a new license for the Packwood Lake Hydroelectric Project. In addition, during the previous license period, Energy Northwest maintained Forest Service Trail 74 that enhanced the public use of project lands, installed a trailrace barrier that protected resident and anadromous fish in the Cowlitz River, and operated the project with consideration for the protection of resources associated with Packwood Lake and lower Lake Creek. Energy Northwest uses the project to help meet local power needs, and the project provides employment opportunities.

PROJECT ECONOMICS

91. 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 projects, as articulated in *Mead Corp.*,[58] the Commission uses current costs to compare the costs of the project and likely alternative power with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. 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 of 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.

92. In applying this analysis to the Packwood Lake Hydroelectric Project, staff considered two options: Energy Northwest's proposal and the project as licensed herein. As proposed by Energy Northwest, the levelized annual cost of operating the project is $2,278,000 or $27.20/MWh. As proposed, the project would generate an estimated average of 83,655 MWh of energy annually. When staff's estimate of average generation is multiplied by the alternative power cost of $68/MWh,[59] the result is the total value of the project's power of $5,588,000 in 2018 dollars. To determine whether the proposed project is currently economically beneficial, staff subtracts the project's cost from the total value of the project's power. The outcome is that in the first year of continued operation, the project would cost $3,410,000 or $40.80/MWh less than the likely alternative cost of power.

93. As licensed herein with the mandatory conditions and staff measures, the levelized annual cost of operating the project would be about $2,406,000 or $28.80/MWh. As licensed, the Packwood Lake Hydroelectric Project would continue to generate an estimated average of 83,655 MWh of energy annually. The project, therefore, would produce power valued at $5,688,000 when multiplied by the $68/MWh value of the project's power. Therefore, in the first year of operation, the project would cost $3,282,000 or $39.20/MWh, less than the likely alternative cost of power.

[58] 72 FERC ¶61,027 (1995).

[59] The alternative power cost of $68 per MWh is based on information from the Department of Energy's 2017 Hydropower Market Report (April 2018) and includes energy and capacity components.

COMPREHENSIVE DEVELOPMENT

94. Sections 4(e) and 10(a)(1) of the FPA[60] 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; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued must 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.

95. The final EA for the project contains background information, analysis of effects, and support for related license articles. Based on the record of this proceeding, including the EA and the comments thereon, licensing the Packwood Lake Hydroelectric Project as described in this order will 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.

96. Based on Commission staff's independent review and evaluation of the project, recommendations from the resource agencies and other stakeholders, and the no-action alternative, as documented in the final EA, the project as licensed herein, is best adapted to a comprehensive plan for improving or developing Lake Creek and the Cowlitz River.

97. This alternative is selected 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 or enhance fish and wildlife resources, water quality, and recreation, aesthetic, and cultural resources; and (3) the 26.125 MW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution.

[60] 16 U.S.C. §§ 797(e) and 803(a)(1) (2012).

LICENSE TERM

98. Section 15(e) of the FPA[61] provides that any new license issued shall be for a term that the Commission determines to be in the public interest, but no less than 30 years or more than 50 years.

99. On October 19, 2017, the Commission established a 40-year default license term policy for original and new licenses, effective as of October 26, 2017.[62] The Policy Statement provides for exceptions to the 40-year default license term under certain circumstances: (1) establishing a shorter or longer license term if necessary to coordinate license terms for projects located on the same river basin; (2) deferring to a shorter or longer license term explicitly agreed to in a generally-supported comprehensive settlement agreement; and (3) establishing a longer license term upon a showing by the license applicant that substantial voluntary measures were either previously implemented during the prior license term, or substantial new measures are expected to be implemented under the new license.

100. Because none of the above exceptions apply in this case, a 40-year license for the Packwood Lake Hydroelectric Project is appropriate.

The Director orders:

(A) This license is issued to Energy Northwest (licensee) to operate and maintain the Packwood Lake Hydroelectric Project, effective October 1, 2018, for a period of 40 years. This license is subject to the terms and conditions of the Federal Power Act (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 those lands, enclosed by the project boundary shown by Exhibit G filed February 25, 2008.

Exhibit G Drawing	FERC Drawing Number	Description
G-1	P-2244 – 1001	Project Boundary Packwood Lake Hydroelectric Project

[61] 16 U.S.C. § 808(e) (2012).

[62] *Policy Statement on Establishing License Terms for Hydroelectric Projects*, 161 FERC ¶ 61,078 (2017).

Exhibit G Drawing	FERC Drawing Number	Description
G-2	P-2244 – 1002	Project Boundary Packwood Lake Hydroelectric Project
G-3	P-2244 – 1003	Project Boundary Packwood Lake Hydroelectric Project
G-4	P-2244 – 1004	Project Boundary Packwood Lake Hydroelectric Project
G-5	P-2244 – 1005	Project Boundary Packwood Lake Hydroelectric Project
G-6	P-2244 – 1006	Project Boundary Packwood Lake Hydroelectric Project
G-7	P-2244 – 1007	Project Boundary Packwood Lake Hydroelectric Project
G-8	P-2244 – 1008	Project Boundary Packwood Lake Hydroelectric Project
G-9	P-2244 – 1009	Project Boundary Packwood Lake Hydroelectric Project

(2) The project works consisting of: (a) a 452-acre natural lake (Packwood Lake) at a normal full pool elevation of 2,857 feet above mean sea level (msl) with about 4,162 acre-feet of useable storage; (b) a trapezoidal intake canal about 424 feet long; (c) a concrete dam that is 15-feet-high and 85-feet-long with a stilling basin; (d) an intake building on Lake Creek adjacent to the dam; (e) a 4.1-mile-long conveyance system of concrete pipe and tunnels; (f) a 1.1-mile-long concrete-encased steel penstock; (g) a concrete surge tank that is 5.5 feet in diameter and 191-feet-high; (h) a concrete powerhouse with a 26.125 MW turbine generator; (i) an excavated trapezoidal tailrace channel with an asphalt lining that is 29-feet-wide at the top and 9-feet-wide at the bottom; (j) a tailrace fish barrier; (k) a switchyard; and (l) a 1.5-mile-long, 69 kV transmission line; and (k) appurtenant facilities.

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

Exhibit A: The following sections of Exhibit A filed on February 25, 2008:

Section A.1.2, pages A-3 and A-4 entitled “Packwood Lake,” section A.2, pages A-5 through A-17 entitled “Packwood Lake Project Facilities,” and section A.4, page A-18 entitled “Lands of the United States.”

Exhibit F: The following Exhibit F drawings filed on February 25, 2008, and June 6, 2008 (Exhibits F-1.1 and F-1.2 only):

Exhibit F Drawing	FERC No. 2244-	Description
Sheet F-1.1	1001	Intake Canal and Drop Structure Plan and Sections
Sheet F-1.2	1002	Intake Plans and Section; Drop Structure Rating Curve
Sheet F-2	1003	Pipeline, Tunnel, Surge Tank, and Penstock Sections; Surge Tank Plan
Sheet F-3	1004	Powerhouse Plans and Sections
Sheet F-4	1005	Tailrace Canal Plans and Sections
Sheet F-5	1006	Tailrace Canal Plans and Sections
Sheet F-6	1007	Tailrace Fish Barrier Plans and Sections
Sheet F-7	1008	Project Profile

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

(C) The Exhibits A, F, and G described above are approved and made part of this license.

(D) This license is subject to the conditions submitted by the Washington Department of Ecology under section 401(a)(1) of the Clean Water Act, 33 U.S.C. § 1341(a)(1) (2012), as those conditions are set forth in Appendix A to this order.

(E) This license is subject to the conditions submitted by the U.S. Department of Agriculture - Forest Service under section 4(e) of the FPA, as those conditions are set forth in Appendix B to this order.

(F) This license is subject to the conditions submitted by the National Marine Fisheries Service under Section 18 of the FPA, as those conditions are set forth in Appendix C to this order.

(G) This license is subject to the incidental take terms and conditions of the biological opinion submitted by the National Marine Fisheries Service under section 7 of the Endangered Species Act, as those conditions are set forth in Appendix D to this order.

(H) This license is also subject to the articles set forth in Form L-1 (October 1975), entitled "Terms and Conditions of License for Constructed Major Project Affecting Lands 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 must pay the United States annual charges, effective as of the first day of the month in which the license is issued, and as determined in accordance with provisions of the Commission's regulations in effect from time to time, for the purpose of:

(1) reimbursing the United States for the cost of administering Part I of the Federal Power Act. The authorized installed capacity for that purpose is 26.125 megawatts.

(2) recompensing the United States for the use, occupancy, and enjoyment of 511.65 acres of its lands (other than for transmission lined right-of-way).

Article 202. *Exhibit Drawings.* Within 45 days of the date of issuance of this license, as directed below, the licensee must file two sets of the approved exhibit drawings in electronic file format on compact disks with the Secretary of the Commission, ATTN: OEP/DHAC.

(a) The licensee must prepare digital images of the approved exhibit drawings in electronic format. Prior to preparing each digital image, the licensee must add the FERC Project-Drawing Number (e.g., P-2244-1001 through P-2244-1009) in the margin below the title block of the corresponding approved drawing. The licensee must separate the Exhibit F drawings from other project exhibits, and identify them as **Critical Energy Infrastructure Information (CEII) material under 18 C.F.R. § 388.113(c).** Each drawing must be a separate electronic file, and the file name must include: FERC Project-Drawing Number, FERC Exhibit Number, Drawing Title, date of this license, and file extension in the following format [P-2244-####, F-#, Description, MM-DD-YYYY.TIF].

Each Exhibit G drawing that includes the project boundary must contain a minimum of three known reference points (*i.e.*, latitude and longitude coordinates, or state plane coordinates), arranged in a triangular format for GIS georeferencing the project boundary drawing to the polygon data. The licensee must identify the spatial reference for the drawing (*i.e.*, map projection, map datum, and units of measurement) on the drawing and label each reference point. In addition, a registered land surveyor must stamp each project boundary drawing. All digital images of the exhibit drawings must meet the following format specification:

IMAGERY – black & white raster file

FILE TYPE – Tagged Image File Format (TIFF), CCITT Group 4
(also known as T.6 coding scheme)
RESOLUTION – 300 dots per inch (dpi) desired, (200 dpi minimum)
DRAWING SIZE FORMAT – 22" x 34" (minimum), 24" x 36" (maximum)
FILE SIZE – less than 1 megabyte desired

The licensee must file a third set of the digital images (Exhibit G only) and a copy of Form FERC-587 with the Bureau of Land Management office at the following address:

State Director
Bureau of Land Management
Lands and Minerals Adjudication Section (OR 936.1)
PO Box 2965
ATTN: FERC Withdrawal Recordation

Form FERC-587 is available through the Commission's website at the following URL: http://www.ferc.gov/docs-filing/forms/form-587/form-587.pdf. Although instruction no. 3 on Form FERC-587 requires microfilm copies of the project boundary maps in aperture card format, please substitute electronic copies that meet the digital specifications in this ordering paragraph. A hard copy of Form FERC-587 is available by mailing a request to the Secretary of the Commission.

(b) Project boundary GIS data must be in a georeferenced electronic file format (such as ArcGIS shapefiles, GeoMedia files, MapInfo files, or a similar GIS format). The filing must include both polygon data and all reference points shown on the individual project boundary drawings. Each project development must have an electronic boundary polygon data file(s). Depending on the electronic file format, the polygon and point data can be included in single files with multiple layers. The georeferenced electronic boundary data file must be positionally accurate to ±40 feet in order to comply with National Map Accuracy Standards for maps at a 1:24,000 scale. The file name(s) must include: FERC Project Number, data description, date of this license, and file extension in the following format [P-2244, boundary polygon or point data, MM-DD-YYYY.SHP]. The filing must include a separate text file describing the spatial reference for the georeferenced data: map projection used (*i.e.*, UTM, State Plane, Decimal Degrees, etc.), the map datum (*i.e.*, North American 27, North American 83, etc.), and the units of measurement (*i.e.*, feet, meters, miles, etc.). The text file name must include: FERC Project Number, data description, date of this license, and file extension in the following format [P-2244, project boundary metadata, MM-DD-YYYY.TXT]

In addition, for those projects that occupy federal lands, the filing must include a separate georeferenced polygon file(s) that identifies transmission line acreage and non-transmission line acreage affecting federal lands. The file(s) must also identify each

federal owner (*e.g.*, Bureau of Land Management, Forest Service, U.S. Army Corps of Engineers, *etc.*), land identification (*e.g.*, forest name, Section 24 lands, national park name, *etc.*), and federal acreage affected by the project boundary. Depending on the georeferenced electronic file format, a single file with multiple layers may include the polygon, point, and federal lands data.

Article 203. *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 must 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. *Project Modification Resulting from Environmental Requirements.* If environmental requirements under this license require modification that may affect the project works or operations, the licensee must consult with the Commission's Division of Dam Safety and Inspections—Portland Regional Engineer. Consultation must allow sufficient review time for the Commission to ensure that the proposed work does not adversely affect the project works, dam safety, or project operation.

Article 401. *Requirements to File Mandatory Plans and Reports, Notification of Temporary Modifications to Mandatory Condition Requirements, and Requirement to File Amendment Applications.*

(a) Requirements to File Plans for Commission Approval

The Washington Department of Ecology's water quality certification (WQC) under section 401 of the Clean Water Act (Appendix A), the U.S. Department of Agriculture - Forest Service's (Forest Service) section 4(e) conditions (Appendix B), and the National Marine Fisheries Service's (NMFS) biological opinion's reasonable and prudent measures (RPM) (Appendix D) under section 7(a)(2) of the Endangered Species Act require the licensee to prepare plans in consultation with the conditioning agencies for their review and implement specific measures without prior Commission approval. The following plans and protocols must also be submitted to the Commission for approval by the deadlines specified below:

Forest Service 4(e) Condition No.	WQC Condition No.	NMFS RPM	Plan name	Commission Deadline
9	-		Packwood Lake intake fish entrainment monitoring plan, including subsequent revisions, as applicable	3 months from license issuance
12	-		Threatened, endangered, and sensitive species management plan	1 year from license issuance
-	4.5		Plan to address Cowlitz River water temperature issues if monitoring reveals violations of state standards at the tailrace confluence	4 years from license issuance
-	5.4		Water quality protection plan	Prior to all project related work in or near water that has the potential to affect surface or groundwater
		2	Develop and implement stream restoration and enhancement plan	2 years from license issuance
		3	Develop and implement plan to improve fish passage on Snyder Creek	2 years from license issuance
		9	Plan for development of plan(s) and report(s)	1 year from license issuance
		7	Fall-run Chinook monitoring plan	1 year from license issuance

With each plan filed with the Commission, the licensee must include documentation that it developed the plan in consultation with the above-listed agencies and provide copies of any comments received, as well as its response to each comment. The Commission reserves the right to make changes to any plan filed. Upon Commission approval, the plan becomes a requirement of the license, and the licensee must implement the plan, including any changes required by the Commission. Any changes to the above

schedule or plans require approval by the Commission before implementing the proposed change.

(b) Requirements to File Reports

Two conditions of the Washington Department of Ecology WQC in Appendix A and one NMFS's RPM in Appendix D require the licensee to file reports. Because these reports relate to compliance with the requirements of this license, and may have a bearing on future actions, they must also be filed with the Commission for approval. The reports are listed in the following table:

WQC Condition No.	NMFS RPM	Plan name	Commission Deadline
3.1.P.4		Report pertaining to project-related fish kills, discharge of oil, fuel, or chemicals into state waters or land adjacent to state waters, or violations of turbidity criteria	Within 5 days of any such event
5.5.A.3.g		Spill follow-up report	Within 15 days of the incident
	1	Prepare annual report summarizing actions taken to protect ESA-listed Chinook and coho salmon, and steelhead, and critical habitat	1 year from license issuance and each year thereafter

(c) Requirement to Notify Commission of Planned and Unplanned Deviations from License Requirements

Two Forest Service conditions in Appendix B and one Washington Department of Ecology condition in Appendix A would allow the licensee to temporarily modify project operations under certain conditions. The Commission must be notified prior to implementing such modifications, if possible, or in the event of an emergency, as soon as possible, but no later than 10 days after each such incident. Washington Department of Fish and Wildlife, Washington Department of Ecology, National Marine Fisheries

Service, and U.S. Fish and Wildlife Service must also be notified prior to implementing any modifications to these conditions.

Forest Service condition	WQC condition	License requirement
2.7	-	Any deviations from approved plans or terms and conditions
4	-	Packwood Lake drawdown rate
-	5.1	Modifications to instream flow requirements

(d) Requirement to File Amendment Applications

Certain WQC conditions of Appendix A contemplate long-term non-specific changes to project operations or facilities (e.g., Conditions 3.1.H, 3.1.I, 3.1.J, and 5.1) or changes to the requirements of the WQC conditions (e.g., Condition 3.1.B). These changes may not be implemented without prior Commission authorization granted after the filing of an application to amend the license. In any amendment request, the licensee must identify related project requirements and request corresponding amendments or extensions of time as needed to maintain consistency among requirements.

Article 402. *Reservation of Authority to Prescribe Fishways.* Authority is reserved to the Commission to require the licensee to construct additional or modified fishways at such times and location as may be determined to provide for safe, timely, and effective downstream and upstream passage of anadromous fish through the project as may be prescribed by the Secretary of Commerce pursuant to section 18 of the Federal Power Act.

Article 403. *Threatened, Endangered, and Sensitive Species Management Plan.* The threatened, endangered, and sensitive species management plan required by U.S. Forest Service condition 12 in Appendix B of this license must include:

(1) a provision to conduct surveys and develop protection measures, as needed, for Oregon goldenaster, nesting bald eagle, and nesting northern spotted owl prior to any land-disturbing or in-water construction activities associated with the stream restoration activities along lower Lake Creek required by U.S. Forest Service condition 7; and

(2) a provision to conduct surveys and develop protection measures, as needed, for special-status amphibians prior to any land-disturbing or in-water construction activities associated with the fish passage improvements on Snyder and Hall Creeks required by U.S. Forest Service condition 10.

In addition to the U. S. Forest Service, the plan must be developed in consultation with the Washington Department of Ecology, Washington Department of Fish and Wildlife, the National Marine Fisheries Service, and the U.S. Fish and Wildlife Service. The licensee must include with the plan copies of comments and recommendations made 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 must allow a minimum of 30 days for the consulted agencies to comment and make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. The revised plan must not be implemented until the licensee is notified that it has been approved by the Commission. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

Article 404. *Integrated Weed Management Plan.* Within 120 days of license issuance, and in accordance with U.S. Forest Service condition 16 in Appendix B of this license, the licensee must file with the Commission for approval, a revised Integrated Weed Management Plan. The plan must be based on, and include the provisions of, the proposed Integrated Weed Management Plan filed with the Commission on June 6, 2008, with the following modifications:

(1) include the area in proximity to the tailrace where existing populations of Oregon goldenaster occur and areas where ground disturbance would occur as a result of the stream restoration activities along lower Lake Creek required by U.S. Forest Service condition 7 and the fish passage improvements on Snyder and Hall Creeks required by U.S. Forest Service condition 10; and

(2) include the following additional noxious weeds and non-native invasive plant target species: Scotch broom (*Cytisus scoparius*); butterfly bush (*Buddleja davidii*); Japanese knotweed (*Polygonum cuspidatum*); Himalayan blackberry (*Rubus discolor*); cut-leaf blackberry (*Rubus laciniatus*); reed canarygrass (*Phalaris arundinacea*); Canada thistle (*Cirsium arvense*); herb Robert (*Geranium robertianum*); common cat's-ear (*Hypochaeris radicata*); and wild carrot (*Daucus carota*).

The revisions to the existing plan must be developed in consultation with the Lewis County Noxious Weed Board, Washington Natural Heritage Program, and the U.S. Forest Service. The licensee must include with the plan copies of comments and recommendations made 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 must allow a minimum of 30 days for the consulted agencies to comment and make recommendations before filing the plan with the Commission. If the

licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. The revised plan must not be implemented until the licensee is notified that it has been approved by the Commission. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

Article 405. *Columbia River Basin Fish and Wildlife Program*. The Commission reserves the authority to order, upon its own motion or upon the recommendation of federal and state fish and wildlife agencies, affected Indian Tribes, or the Northwest Power and Conservation Council, alterations of project structures and operations to take into account to the fullest extent practicable the regional fish and wildlife program developed and amended pursuant to the Pacific Northwest Electric Power Planning and Conservation Act.

Article 406. *Programmatic Agreement and Historic Properties Management Plan*. The licensee must implement the "Programmatic Agreement among the Federal Energy Regulatory Commission and the Washington State Historic Preservation Officer for Managing Historic Properties that may be Affected by a License Issuing to Energy Northwest for the Continued Operation of the Packwood Lake Hydroelectric Project in Lewis County, Washington (FERC No. 2244)," executed on October 26, 2009, including but not limited to the Historic Properties Management Plan (HPMP) for the project filed with the Commission on August 30, 2007, as required by U.S. Forest Service condition 18.

In the event that the Programmatic Agreement is terminated, the licensee must continue to implement the provisions of its approved HPMP. 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, the licensee must obtain approvals from or make modifications requested by the Commission and the Washington State Historic Preservation Office where the HPMP calls upon the licensee to do so.

Article 407. *Use and Occupancy*. (a) In accordance with the provisions of this article, the licensee must 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 also must 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 or a conveyance made under the authority of this article is violated, the licensee must 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 types 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 watercraft 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 must require multiple use and occupancy of facilities for access to project lands or waters. The licensee must 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 must: (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 if 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 must 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.

(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 watercraft 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 5 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 with the Commission, 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 Commission's authorized representative, 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 must 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 must 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 must not endanger health, create a

nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee must 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; and (iii) the grantee must not unduly restrict public access to project lands or waters.

(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 must 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 must not apply to any part of the public lands and reservations of the United States included within the project boundary.

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

(J) 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 Federal Power Act. 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 must constitute acceptance of this license.

Terry Turpin
Director
Office of Energy Projects

Form L-1
(October, 1975)

FEDERAL ENERGY REGULATORY COMMISSION
TERMS AND CONDITIONS OF LICENSE
FOR CONSTRUCTED MAJOR PROJECT AFFECTING
LANDS OF THE UNITED STATES

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

Article 2. No substantial change must 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 must 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 must be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, must become a part of the license and must 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 must 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 must require for the protection of navigation, life, health, or property, there must 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 must 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, must 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, must 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 must be the authorized representative of the Commission for such purposes. The Licensee must cooperate fully with said representative and must furnish him such information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and must 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 must 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 must 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 must not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The Licensee must 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 must 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, must 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 must, 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 must 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, must 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 non-power licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns must be responsible for, and must 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 must pay and discharge, or must 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, must be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee must 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; must provide for the required reading of such gages and for the adequate rating of such stations; and must 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, must 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, must 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 must 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 must keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and must make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The Licensee must, 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 must, 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 must reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission must determine to be equitable, and must 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 must 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 operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, must at all times be controlled by such reasonable rules and regulations 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 must 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 Commission may prescribe for the purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee must 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 must 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 must 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 must 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 which 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 must 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 must 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 must, 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 must 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 must 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 must 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 must 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 must construct, maintain, and operate, or must 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 must 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 must 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 must be responsible for, and must 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 must clear and keep clear to an adequate width lands along open conduits and must 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 must be removed. All clearing of the lands and disposal of the unnecessary material must 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. Timber on lands of the United State cut, used, or destroyed in the construction and maintenance of the project works, or in the clearing of said lands, must be paid for, and the resulting slash and debris disposed of, in accordance with the requirements of the agency of the United States having jurisdiction over said lands. Payment for merchantable timber must be at current stumpage rates, and payment for young growth timber below merchantable size must be at current damage appraisal values. However, the agency of the United States having jurisdiction may sell or dispose of the merchantable timber to others than the Licensee: Provided, That timber so sold or disposed of must be cut and removed from the area prior to, or without undue interference with, clearing operations of the Licensee and in coordination with the Licensee's project construction schedules. Such sale or disposal to others must not relieve the Licensee of responsibility for the clearing and disposal of all slash and debris from project lands.

Article 22. The Licensee must do everything reasonably within its power, and must require its employees, contractors, and employees of contractors to do everything reasonably within their power, both independently and upon the request of officers of

the agency concerned, to prevent, to make advance preparations for suppression of, and to suppress fires on the lands to be occupied or used under the license. The Licensee must be liable for and must pay the costs incurred by the United States in suppressing fires caused from the construction, operation, or maintenance of the project works or of the works appurtenant or accessory thereto under the license.

Article 23. The Licensee must interpose no objection to, and must in no way prevent, the use by the agency of the United States having jurisdiction over the lands of the United States affected, or by persons or corporations occupying lands of the United States under permit, of water for fire suppression from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license, or the use by said parties of water for sanitary and domestic purposes from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license.

Article 24. The Licensee must be liable for injury to, or destruction of, any buildings, bridges, roads, trails, lands, or other property of the United States, occasioned by the construction, maintenance, or operation of the project works or of the works appurtenant or accessory thereto under the license. Arrangements to meet such liability, either by compensation for such injury or destruction, or by reconstruction or repair of damaged property, or otherwise, must be made with the appropriate department or agency of the United States.

Article 25. The Licensee must allow any agency of the United States, without charge, to construct or permit to be constructed on, through, and across those project lands which are lands of the United States such conduits, chutes, ditches, railroads, roads, trails, telephone and power lines, and other routes or means of transportation and communication as are not inconsistent with the enjoyment of said lands by the Licensee for the purposes of the license. This license must not be construed as conferring upon the Licensee any right of use, occupancy, or enjoyment of the lands of the United States other than for the construction, operation, and maintenance of the project as stated in the license.

Article 26. In the construction and maintenance of the project, the location and standards of roads and trails on lands of the United States and other uses of lands of the United States, including the location and condition of quarries, borrow pits, and spoil disposal areas, must be subject to the approval of the department or agency of the United States having supervision over the lands involved.

Article 27. The Licensee must make provision, or must bear the reasonable cost, as determined by the agency of the United States affected, of making provision for avoiding inductive interference between any project transmission line or other project facility

constructed, operated, or maintained under the license, and any radio installation, telephone line, or other communication facility installed or constructed before or after construction of such project transmission line or other project facility and owned, operated, or used by such agency of the United States in administering the lands under its jurisdiction.

Article 28. The Licensee must make use of the Commission's guidelines and other recognized guidelines for treatment of transmission line rights-of-way, and must clear such portions of transmission line rights-of-way across lands of the United States as are designated by the officer of the United States in charge of the lands; must keep the areas so designated clear of new growth, all refuse, and inflammable material to the satisfaction of such officer; must trim all branches of trees in contact with or liable to contact the transmission lines; must cut and remove all dead or leaning trees which might fall in contact with the transmission lines; and must take such other precautions against fire as may be required by such officer. No fires for the burning of waste material must be set except with the prior written consent of the officer of the United States in charge of the lands as to time and place.

Article 29. The Licensee must cooperate with the United States in the disposal by the United States, under the Act of July 3l, 1947, 61 Stat. 681, as amended (30 U.S.C. sec. 601, et seq.), of mineral and vegetative materials from lands of the United States occupied by the project or any part thereof: Provided, That such disposal has been authorized by the Commission and that it does not unreasonably interfere with the occupancy of such lands by the Licensee for the purposes of the license: Provided further, That in the event of disagreement, any question of unreasonable interference must be determined by the Commission after notice ad opportunity for hearing.

Article 30. If the Licensee must cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or must 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 31. 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, must 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 32. The terms and conditions expressly set forth in the license must not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

APPENDIX A

WASHINGTON STATE DEPARTMENT OF ECOLOGY CLEAN WATER ACT § 401 CERTIFICATION CONDITIONS

Packwood Lake Hydroelectric Project
FERC Project No. 2244

3.0 CONDITIONS

In view of the foregoing and in accordance with Section 401 of the Clean Water Act (33 USC 1341), RCW 90.48.260, and WAC Chapter 173-201A, Ecology finds reasonable assurance that implementation of the compliance schedule and adaptive management strategy contained in the proposed license will result in the attainment and compliance with state and federal water quality standards and other appropriate requirements of state law provided the following conditions are met. Accordingly, through this Certification, Administrative Order (Order), issued and enforceable under RCW 90.48, Ecology grants a Section 401 water quality certification to the Licensee, Energy Northwest (EN) for the Packwood Lake Hydroelectric Project (FERC No. 2244) subject to the following conditions. This Order will hereafter be referred to as the "Certification-Order."

3.1 General Conditions and Requirements

A. The project must comply with all water quality standards approved by the Environmental Protection Agency (currently codified in chapter 173-201A WAC), ground water quality standards (currently codified in chapter 173-200 WAC), and sediment quality standards (currently codified in chapter 173-204 WAC) and other appropriate requirements of state law. Certification of this project does not authorize the Licensee to exceed applicable state water quality standards (chapter 173-201A WAC).

Furthermore, nothing in this Certification-Order absolves the Licensee from liability for contamination and any subsequent cleanup of surface waters, ground waters, or sediments occurring as a result of activities associated with Project operations and FERC license conditions.

B. In the event of changes or amendments to the state water quality, ground water quality, or sediment standards, or changes in or amendments to the state Water

Pollution Control Act (RCW 90.48), or changes in or amendments to the Clean Water Act, such provisions, standards, criteria, or requirements must apply to this project and any attendant agreements, orders or permits. Ecology will notify the Licensee through an Administrative Order of any such changes or amendments applicable to its project.

C. Discharge of any solid or liquid waste to the waters of the state of Washington without prior approval from Ecology is prohibited.

D. The Licensee must obtain Ecology review and approval before undertaking any change to the project or project operations that might violate water quality or affect compliance with any applicable water quality standard (including designated uses) or other appropriate requirement of state law.

E. This Certification-Order does not exempt the Licensee from compliance with other statutes and codes administered by federal, state, and local agencies.

F. The Licensee must acquire a Hydraulic Project Approval (HPA) (under 77.55 RCW) from the Washington State Department of Fish and Wildlife (WDFW) if required prior to any work in waters of the state.

G. Ecology retains the right, by further Order, to modify schedules or deadlines provided under this Certification-Order or provisions it incorporates.

H. Ecology retains the right by Administrative Order to require additional monitoring studies or measures if it determines there is likelihood that violations of water quality standards or other appropriate requirements of state law have occurred or may occur, or insufficient information exists to make such determination.

I. This Certification-Order is based on the currently available data and analysis for different parameters of concerns. Ecology specifically reserves the right to make any further modifications to this order based upon any future total maximum daily loading study (TMDL) findings, allocations of pollutant load or water quality studies conducted by the Licensee or its consultants.

J. Ecology reserves the right to amend this Certification-Order if it

determines that the provisions hereof are no longer adequate to provide reasonable assurance of compliance with applicable water quality standards or other appropriate requirements of state law. Any such amended Order must take effect immediately upon issuance, unless otherwise provided in the amended Order, and may be appealed to the Pollution Control Hearings Board (PCHB) under chapter 43.21B RCW.

K. Ecology reserves the right to issue orders, assess or seek penalties, and to initiate legal actions in any court or forum of competent jurisdiction for the purposes of enforcing the requirements of this Certification-Order.

L. The conditions of this Certification-Order must not be construed to prevent or prohibit the Licensee from either voluntarily or in response to legal requirements imposed by a court, the FERC, or any other body with competent jurisdiction, taking actions which will provide a greater level of protection, mitigation, or enhancement of water quality or of existing or designated uses.

M. Copies of this Certification-Order and associated permits, licenses, approvals and other documents must be kept on the Project site and made readily available for reference by the Licensee, its contractors and consultants, and by Ecology.

N. The Licensee must allow Ecology access to inspect the project and project records required by this Certification-Order for the purpose of monitoring compliance with its conditions. Access must occur after reasonable notice, except in emergency circumstances.

O. The Licensee must, upon request by Ecology, fully respond to requests for materials to assist Ecology in making determinations under this Certification- Order and any resulting rulemaking or other process.

P. Any work that is out of compliance with the provisions of this Certification- Order, or conditions that result in distressed, dying or dead fish, or any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, or violation of turbidity criteria is prohibited. If these conditions occur, the Licensee must immediately take the following actions:

1. Cease operations at the location of the violation to the extent such operations may reasonably be causing or contributing to the problem.

2. Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.

3. Notify Ecology of the failure to comply with water quality standards. Oil or chemical spill events must be reported immediately to Ecology's 24-Hour Spill Response Team at 360-407-6300 within 24 hours. Other non-compliance events must be reported to Ecology's Federal Permit Manager at 800-424-8802.

4. Submit a detailed written report to Ecology within five days that describes the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.

5. Observed violations at the project must be highlighted in the annual monitoring report.

Compliance with these requirements does not relieve the Licensee from responsibility to maintain continuous compliance with the terms and conditions of this Certification-Order or the resulting liability from failure to comply.

4.0 CURRENT STANDARDS

4.1 Washington State Water Pollution Control Act

Waters of the state are assigned designated uses under WAC 173-201A. Designated uses for this section of the Cowlitz River and tributary to the Cowlitz River include, but are not limited to the uses described in Table 3-1 below.

For aquatic life uses, it is also required that all indigenous fish and non-fish aquatic species be protected in waters of the state in addition to the key species described below (WAC 173-201A- 200(1).

Table 3-1 Designated Uses

River Reach Description	Designated Uses
Packwood Lake and all feeder streams	• Aquatic Life Uses – Core summer salmonid habitat. The key identifying characteristics of this use are summer (June 15 – September 15) salmonid spawning or emergence, or adult holding; use as important summer rearing habitat by one or more salmonids; or foraging by adult and sub-adult native char. • Other common characteristic aquatic life uses for waters in this category include spawning outside of summer season, rearing, and migration by salmonids. • Recreation – Extraordinary primary contact. • Water Supply – Wildlife Habitat, Harvesting, • Commerce and Navigation, boating and Aesthetics.
Lake Creek	Same as above
Cowlitz River where tailrace enters	Same as above

4.2 Compliance with Standards

EN conducted several water quality studies to assess the existing water quality of Packwood Lake, Lake Creek and the Cowlitz River. Lake Creek discharges to the Cowlitz River above the town of Packwood and the tailrace discharges to the Cowlitz River just downstream of the town of Packwood.

Table 4-2: Existing Water Quality[1]

Parameter	Location	Existing Water Quality
Total Dissolved Gas (TDG)	Tailrace stilling basin (below power house)	98%-103% (range 2004) 98%-102% (range 2005)

Parameter	Location	Existing Water Quality
Dissolved Oxygen (DO)	Packwood Lake	Surface 8.0-10.5 mg/L; Depth 5.1-10.2 mg/L (range 2004) Surface 8.3-10.6 mg/L; Depth 4.9-9.1 mg/L (range 2005)
	Lake Creek (near mouth)	9.4-14.1 mg/L (range 2004) 7.8-12.1 mg/L (range 2005)
	Tailrace stilling basin	8.7-14.7 mg/L (range 2004) 8.6-13 mg/L (range 2005)
	Cowlitz River (upstream of Lake Creek)	9.0-13.8 mg/L (range 2004) 8.4-12.3 mg/L (range 2005)
Turbidity	Lake Creek (below drop structure)[2]	1.2-18.5 NTU (range 2004); 5.5 NTU (mean 2004) 0.1-2.9 NTU (range 2005); 1.4 NTU (mean 2005)
	Lake Creek (near mouth)	0.3-18.5 NTU (range 2004); 3.1 NTU (mean 2004) 1.7 NTU (mean 2005)
	Tailrace stilling basin (below power house)	0.9-7.0 NTU (range 2004); 3.2 NTU (2004 mean) 1.5 NTU (2005 mean)
	Cowlitz River (upstream of Lake Creek)	1.0-54.5 NTU (range 2004); 25.9 NTU (2004 mean) 13.8 NTU (mean 2005)
pH	Packwood Lake	6.7-7.8 S.U. (range 2004); 7.5 S.U. (mean at 1m 2004) 6.6-7.9 S.U. (range 2005); 7.6 S.U. (mean at 1m 2005)
	Lake Creek (below drop structure)	7.0-7.7 S.U. (range 2004); 7.5 S.U. (mean 2004) 7.4-7.9 S.U. (range 2005); 7.6 S.U. (mean 2005)
	Lake Creek (near mouth)	6.9-7.9 S.U. (range 2004); 7.4 S.U. (mean 2004) 6.9-7.8 S.U. (range 2005); 7.3 S.U. (mean 2005)
	Cowlitz River (upstream of Lake Creek)	6.3-7.8 S.U. (range 2004); 7.1 S.U. (mean 2004) 7.0-7.9 S.U. (range 2005), 7.4 S.U. (mean 2005)
	Tailrace (below power house)	6.7-7.9 S.U. (range 2004); 7.3 S.U. (mean 2004) 5.5-7.8 S.U. (range 2005); 7.3 S.U. (mean 2005)
Temperature	Lake Creek (below drop structure)	20.95°C (7-DADmax 2004) 20.81ºC (7-DADmax 2005)
	Lake Creek (near mouth)	14.36°C (7-DADmax 2004) 13.51ºC (7-DADmax 2005) 19.09 ºC (Modeled temperature for the creek without-the-project condition)
	Tailrace Stilling Basin (below powerhouse)	20.67°C (7-DADmax 2004) 21.82ºC (7-DADmax 2005)

Parameter	Location	Existing Water Quality
	Tailrace (near the Cowlitz)	21.25°C (7-DADmax 2004) 20.83ºC (7-DADmax 2005)
	Cowlitz River (upstream of Lake Creek)	14.90°C (7-DADmax 2004) 15.10ºC (7-DADmax 2005)
	Cowlitz (downstream of tailrace)	21.91°C (7-DADmax 2004) 18.41ºC (7-DADmax 2005)
[1]Data from three reports: the EN Water Quality 2nd year report (2005 data), February 2007; EN Water Quality Interim Report: 1st Year Study Results (2004 data); and EN Final Water Temperature Report for 2005 submitted February 2007 (EES, 2007). Note that most of the 2004 and 2005 data sets include three months of the following year (January – March).		
[2]The Lake Creek site was labeled LCDS (Lake Creek Drop Structure) in the EN studies.		

4.3 Numeric Criteria

Numeric criteria for the designated uses are found in WAC 173-201A. These include criteria for TDG, pH, dissolved oxygen (DO), fecal coliform, turbidity and temperature.

4.4 Total Dissolved Gas (TDG)

This project does not appear to have a problem with generating total dissolved gas (TDG). The TDG in the stilling basin stayed below the criterion of 110 percent of saturation.

However, if changes are made to the turbines or other parts of the project that have the potential to produce TDG, the Licensee must monitor water quality and make physical and operational changes to meet water quality standards if the water exceeds the criterion.

The project must not cause any exceedance of the TDG water quality criteria as specified in WAC 173-201A-200 (1)(f). The Licensee must manage spill and power production to limit TDG production to 110 percent or less saturation.

4.5 Temperature

The action of this project does appear to raise the temperature by more than 0.3ºC, when Packwood lake outlet temperature is compared to the tailrace outlet temperature (EES 2008; 2007/9; 2007; See Appendix A). This appears to occur during a short period of time in middle to late August. The water quality standards require that

temperature data be statistically reduced to one number using a series of calculations. This final temperature for any fresh water body is a yearly maximum of the seven-day running averages of daily maximum temperatures (7-DADmax).

The Packwood Lake project must not cause any violation of the temperature water quality criterion as specified for Core Summer Salmonid Habitat in WAC 173-201A-200 (1)(c). This criterion is specified as16ºC for the waters of the Cowlitz River and Lake Creek. There is also a supplemental spawning criterion of 13ºC from September 1st to May 15th. However WAC 173-201A-200(c)(i) states:

"(i) When a water body's temperature is warmer than the criteria in Table 200 (1)(c) (or within 0.3ºC (0.54ºF) of the criteria) and that condition is due to natural conditions, then human actions considered cumulatively may not cause the 7- DADMax temperature of that water body to increase more than 0.3ºC (0.54ºF)."

EN modeled the pre-project water temperature in Lake Creek using the QUAL2Kw model (EES, 2007/9; 2008; see Appendix A for details). Because the natural condition of Packwood Lake and Lake Creek were warmer than the criterion, these temperatures constitute the criterion. This natural condition temperature supersedes the 16ºC and the supplemental spawning criterion of 13ºC as described in the following paragraph.

Packwood Lake had a 7-DADMax of 20.81ºC, some cooling and ground water inputs naturally occur in Lake Creek which brings the temperature near the mouth of the creek down to a 7-DADMax of 19.09ºC. The temperature near the point where the project tailrace enters the Cowlitz River had a 7-DADMax of 21.25ºC. The difference between these temperatures is 2.16ºC. Because the water quality standards only allows an increase above the natural condition of 0.3ºC, the tailrace temperature is 01.86ºC warmer than allowed

Under WAC 173-201A-510(5), for dams that cause or contribute to a violation of water quality standards, the dam owner is required to provide a detailed strategy for compliance with state water quality standards. The dam owners must develop a water quality attainment plan that provides a detailed strategy to achieve compliance.

EN has proposed a water quality attainment plan in accordance with the compliance schedule requirements, shown in Appendix A and WAC 173-201A-510(5). A major part of the attainment plan is a proposed operation change to shut down the project during the warmest period of the summer (August 15th to September 15th). The project currently shuts down operating in October for annual maintenance. However, to provide benefits to public resources, EN will move the annual outage forward to August. Moving the outage to August should have a beneficial effect on water temperature in the Cowlitz River at the confluence with the tailrace.

Ecology agrees with the goals of the attainment plan except that monitoring must occur for three years from license issuance rather than the ten years set forth in Appendix A. Should the temperature in the tailrace continue to exceed standards as identified, following the three year monitoring period, the Licensee must identify adaptive management strategies to further improve the temperature, in accordance with the compliance schedule described in WAC 173-201A-510(5). Options under a compliance schedule, are described in WAC 173-201A-510(5)(g)(ii). This regulation includes site specific criteria (WAC 173-201A-430), a use attainability analysis (WAC 173-201A-440), or a water quality offset (WAC 173-201A-450).

If, however, the temperature criterion is met throughout the outage period and shown with three years of data collection (that is, the data shows no temperature exceedance), the Licensee does not need to consider further action.

If the water quality data does show there is a problem meeting the temperature criteria as stated above, the Licensee must develop a plan to achieve compliance with the water quality temperature criteria. The plan must be submitted by year four following the license issue date. The Licensee must continue to monitor temperature while submitting the plan. The plan must show how the Licensee will achieve compliance within ten years of license issuance. If the licensee cannot find operational or physical changes (that is, to lake withdrawal, facility, penstock, or tailrace), which will meet the temperature criterion, then the licensee must use adaptive management and options described in WAC 173-201A-(430, 440, or 450).

Because the highest temperatures occurred during the middle of the August to September time period, the new maintenance outage timing which will occur from August 15th to September 15th could prevent the warmer water from entering the Cowlitz. This outage will also be timed to occur with the beginning of the Chinook spawning. The maintenance outage used to begin in October. EN predicts the new outage period will result in the water temperature meeting the criterion. Therefore, the outage timed for August should prevent salmon from entering the tailrace waters and address the temperature exceedance.

To confirm the expected beneficial effect on water temperatures of the proposed change in the annual project outage schedule, EN must monitor water temperature at six sites and air temperatures at one site:

- In the tailrace (near the stilling basin, and near the outlet);
- In Lake Creek (near the mouth);
- In Packwood Lake (near the outlet);

- In two sites in the Cowlitz River (upstream of the tailrace discharge and in the main stem); and

- Ambient air temperature (located near the tailrace).

These monitoring locations are different from those shown in Appendix A. Monitoring will take place on an annual basis and at agreed to data recording frequencies between June 25th and October 5th for the first three years of the new license, or unless modified by Ecology.

4.6 Dissolved Oxygen (DO)

The DO in the stilling basin was well above the value seen in the Cowlitz River upstream of Lake Creek. Both the project and Lake Creek appear to add DO. The drop structure at Packwood Lake spills surface water and the bypass from the intake structure is also rather shallow. Therefore the water being spilled into Lake Creek is from the more oxygen rich surface waters of Packwood Lake and not from deep ports below the hypolimnion.

This project does not appear to produce conditions with low DO which could violate water quality standards in Lake Creek or in the Stilling Basin. However, if changes are made to the operations or lake withdrawals or other parts of the project that have thepotential to produce low DO, the Licensee must make physical and operational changes to meet water quality standards.

4.7 Turbidity

The project actions do not appear to have any effect on turbidity. The lake levels are maintained at nearly the same level. Tributaries to the lake are maintained in a fairly pristine condition with little development except that of the withdrawal structure and a few old cabins, which reduces the turbidity entering the lake. The Licensee must manage erosion from roads and the pipeline trail. Numeric criteria for the uses in the project area require that turbidity must not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.

4.8 pH

The pH above and below the project is fairly neutral. The project does not appear to raise or lower the pH beyond the criteria.

4.9 Narrative Criteria

Narrative criteria rely on the analysis of impacts to uses such as aquatic plants and

animals, fish habitat (flow), wildlife habitat, recreation and aesthetics. These criteria are implemented on a case-by-case basis to protect water quality and beneficial uses and are used where numeric standards have not been developed or are not sufficient to protect an existing or designated use.

4.10 Anti-Degradation

Existing and designated uses must be maintained and protected in accordance with WAC 173-201A-300.

5.0 CONDITIONS RELATING TO FLOW AND RAMPING

5.1 Instream Flow

The Licensee must discharge at least the following continuous minimum instream flows from the Packwood Lake drop structure, for the protection of aquatic resources in Lake Creek:

Table 5-1: Instream Flows

Month	Hydro Operational Instream Flow (cfs)
January	4
February	4
March	4
April	7

Month	Hydro Operational Instream Flow (cfs)
May	15
June	10
July	15

August 1st – 15th	15
August 16th – September 15th	20
September 16th – 30th	15
October	10
November	7
December	4

The minimum flow may be temporarily modified if required because of operating emergencies beyond the control of the Licensee, or for short periods upon mutual agreement between the Licensee and Ecology. Ecology reserves the authority to require modification of the minimum flows and ramping rates if new information or analysis shows that the flows are inadequate to protect designated instream uses.

The Licensee (EN) must record and document the quantity of water (in cfs), bypassed through the intake structure (bypass flow), water used for power production (plant flows), and changes in lake level elevation.

The project flow instrumentation automatically sums the plant and bypass flows measured at the intake building and are recorded in acre feet. Habitat forming flows are calculated using a conversion formula based on lake elevation and are recorded.

The information noted above will be provided in the annual project reports.

5.2 Ramping Rates

The licensee must not exceed the following ramping rates in the anadromous portion of Lake Creek:

Table 5-2 Ramping Rates

Season	Daylight Rates[3]	Night Rate
February 16 to June 15[1]	No Ramping	2 inches/hour
June 16 to October 31[2]	1 inch/hour	1 inch/hour

November 1 to February 15	2 inches/hour	2 inches/hour
[1]Salmon fry are present [2]Steelhead fry are present [3]Daylight is defined as one hour before sunrise to one hour after sunset		

The Licensee must measure the Lake Creek flows at the gaging station upstream of the confluence with the Cowlitz River at the Thompson Road (Lake Creek Road) bridge. These ramping rates apply only to changes in Creek height as a result of hydropower withdrawals (down-ramping in the creek). The ramping rates do not apply to changes in Creek height due to storm events which are not tied to ramping and therefore are out of the control of the Licensee.

5.3 Habitat Forming Flows

Researchers found very little small to medium gravel substrate and woody debris in lower Lake Creek to provide for proper fish habitat (EES, 2007/10). These habitat forming flows will aid in the recruitment, mobilization, and deposition of sediment, wood and other organic material. Therefore, EN agreed with the resource agencies to provide pulses of high flows which could distribute gravel added to the system. These habitat forming flows in lower Lake Creek must meet the following restrictions:

- Be greater than or equal to 285 cfs for
  - as long as lake inflows can sustain that flow, or
  - for a maximum of 24 hours every other water year[1],
  - or three out of six water years;
- These flows must start in the first water year following the issuance of the new license; and
- Continue for the life of the permit.

The magnitude of the habitat forming flows must be calculated by adding the measured bypass flows to the spilled flow over the drop structure, using lake elevation and the stage/discharge relationship established at the drop structure.

EN must report annually the attempts and activities of the habitat forming flows, including the magnitude, duration and frequency of the flows and associated power

[1] Water year is defined as an annual precipitation cycle, October 1st through September 30th.

generation throughout each previous year.

5.4 Construction Projects, Miscellaneous Discharges, and Habitat Modifications

The following applies to all over-water or near-water work related to the Project that can impact surface or ground water quality. This includes, but is not limited to, construction, operation, and maintenance of fish collection structures, generation turbines, penstocks, transportation facilities, portable toilets, boat ramps, transmission corridors, structures, and staging areas. This also includes emergencies for all activities related to Project operation.

A. A Water Quality Protection Plan (WQPP) must be prepared, and followed for all Project related work that is in or near water that has the potential to impact surface and/or ground water quality. The WQPP must include control measures to prevent contaminants from entering surface water and groundwaters, and must include, but not be limited to, the following elements:

1. A Stormwater Pollution Prevention Plan (SWPPP) must specify the Best Management Practices (BMPs) and other control measures to prevent contaminants entering the Project's surface water and groundwaters. The SWPPP must address the pollution control measures for the Licensee's activities that could lead to the discharge of stormwater or other contaminated water from upland areas. The SWPPP must also specify the management of chemicals, hazardous materials and petroleum (spill prevention and containment procedures), including refueling procedures, the measures to take in the event of a spill, and reporting and training requirements.

2. An In Water Work Protection Plan (IWWPP) must be consistent with the SWPPP and must specifically address the BMPs and other control measures for the Licensee activities that require work within surface waters. Turbidity and dissolved oxygen must be monitored upstream of the location where in-water construction is taking place and at the point of compliance (as defined in WAC 173-201A-110) during construction. Samples must be taken at a minimum of once each day during construction in or adjacent to any water bodies within the Project area that may be affected by the construction. The IWWPP must

include all water quality protection measures consistent with a Hydraulics Project Approval (HPA) for the Project.

3. The WQPP must include procedures for monitoring water quality, actions to implement should water quality exceedances occur, and procedures for reporting any water quality violations to Ecology. The WQPP must include all water quality protection measures consistent with a HPA for the Project. The WQPP must be submitted to Ecology for review and approval at least three months prior to Project initiation and a copy of the WQPP must be in the possession of the on-site construction manager and available for review by Ecology staff whenever construction work is under way.

4. The Licensee must, at Ecology's discretion, either apply for an National Pollutant Discharge Elimination System (NPDES) permit and comply with the terms and conditions of the permit or apply for and comply with the terms of an individual NPDES permit when:

   - A construction project meets the coverage requirements of a NPDES permit; and/or

   - A State Waste Discharge General Permit for Stormwater Discharges associated with construction activity.

B. Best Management Practices (BMPs)

1. Work in or near the lake, water within the intake structure, Lake Creek, the powerhouse, the tailrace, or any wetlands must include all reasonable measures to minimize the impacts of construction activity on waters of the state. Water quality constituents of particular concern are turbidity, suspended sediment, settleable solids, oil and grease, and pH. These measures include use of BMPs to control erosion and sedimentation, proper use of chemicals, oil and chemical spill prevention and control, and clean up of surplus construction supplies and other solid wastes.

2. During construction, all necessary measures must be taken to minimize the disturbance of existing riparian, wetland,

or upland vegetation.

3. All construction debris must be properly disposed of on land so that the debris cannot enter a waterway or cause water quality degradation to state waters. Retention areas or swales must be used to prevent discharging of water from construction placement areas.

4. The Licensee must ensure that any fill materials that are placed for the proposed habitat improvements in any waters of the state do not contain toxic materials in toxic amounts.

C. Maintaining Turbidity Standards

1. Certification of this Project does not authorize the Licensee to exceed the turbidity standard beyond the mixing zone described in subsections (b) and (c) below. Turbidity in core summer salmonid waters in Packwood Lake, Lake Creek and the Cowlitz River must not exceed five NTU over background turbidity when the turbidity is 50 NTU or less, or have more than a ten percent increase in turbidity when the background turbidity is more than 50 NTU as applied at the edge of a mixing zone.

2. A mixing zone may be established for the turbidity resulting from construction activity. This activity must be consistent with WAC 173- 201A-200(1)(e) and WAC 173-201A-400 within the mixing zone and certain conditions the turbidity standard is waived. Waiving the standard will occur only after the implementation of proper best management practices. The mixing zone is established to allow only temporary exceedances of the turbidity criteria during and immediately after in- water work. The temporary turbidity mixing zone restrictions are as follows:

a. For waters up to 10 cfs flow at the time of construction, the point of compliance must be limited to 100 feet downstream from the activity causing the turbidity exceedance.

b. For waters above 10 cfs to 100 cfs flow at the time of construction, the point of compliance must be

limited to 200 feet downstream from the activity causing the turbidity exceedance.

c. For waters above 100 cfs flow at the time of construction, the point of compliance must be limited to 300 feet downstream from the activity causing the turbidity exceedance.

d. For projects in and around Packwood Lake and associated wetlands, the point of compliance must be limited to a radius of one hundred fifty feet from the activity causing the turbidity exceedance.

5.5 Spills

Protecting aquatic uses through water quality numeric criteria remains the primary purpose of the following conditions. The Project must comply with the standards found in WAC 173-201A, as further described in this Certification. Upon completion of the compliance period, the Licensee must operate the project in full compliance with the state water quality standards.

A. General Oil Spill Prevention & Control Conditions

1. The Licensee must not discharge oil, fuel or chemicals into waters of the state, or onto land with a potential for entry into waters of the state as prohibited by Chapter 90.56 RCW and Chapter 90.48 RCW.

2. For proper disposal, the Licensee must contain wash water with oils, grease or other hazardous materials resulting from wash down of equipment or working areas, and must not discharge these contaminated waters into state waters.

3. Any visible floating oils released from project operation, maintenance activities or construction must be contained and removed from the water.

a. The Licensee must immediately begin and complete containment and clean-up efforts in the event of a discharge of oil, fuel or chemicals in state waters, or onto land with a potential for entry into state waters. This work must take precedence over normal work.

Cleanup must include proper disposal of any spilled material and used clean-up materials.

b. Spills into state waters and spills onto land with a potential for entry into state waters, or other significant water quality impacts, must be reported immediately (within one hour) to the Department of Ecology, Southwest Regional Office at 360-407-6300 (24-hour phone number).

c. The Licensee must participate in the Incident Command System (ICS) whenever a Unified Command is established in response to a spill incident that involves or potentially impacts one or more Projects.

d. Do not use emulsifiers or dispersants in state waters including water contained in sumps or other areas that discharge to sumps, the intake structure, Lake Creek or the tail waters.

e. Project Operators must be familiar with and trained on use of oil spill cleanup materials. In the event of a spill, properly dispose of used/contaminated materials and oil, and as soon as possible restock new supplies. Include records of proper disposal in the oil consumption records and keep copies of disposal records of contaminated cleanup supplies on-site and available for inspection by Ecology.

f. Install, or have on-site to deploy, staircases, ladders, harnesses, etc., which will allow oil spill response personnel to safely reach areas that could, in the event of an oil spill, need to be accessed to deploy sorbent pads, boom material or other cleanup equipment.

g. Following all spills into state waters, or onto land with a potential for discharge to state waters, the Licensee must provide a written follow-up report to Ecology's Southwest Regional Office within 15 days of the incident. The report must include a copy of the Licensee's Spill Report Form, a description of the

incident, response actions taken and any spill prevention measures taken or recommended to prevent similar spills.

4. Identify and map floor drains in the Project. Post these maps at the Project in a conspicuous location for use by Operators and other personnel in the event of a spill. Floor drains that are no longer needed must be blocked or sealed.

5. Oil, fuel and chemical storage containers, containment areas, conveyance systems and oil-filled operating equipment.

   a. Within 180 days, the Licensee must provide Ecology with oil inventory lists and diagrams noting location of containers and oil-filled operating equipment holding more than 55-gallons of oil. The Project-specific oil inventories must include location, type of container, number of containers, volume per container, total shell volume, spill potential, type of oil, PCB content and direction of flow in the event of a spill. Project-specific diagrams should note the location of these containers and oil- filled equipment and general oil spill flow direction;

   b. The Licensee must keep records of the amounts of oil used on- site for all project equipment containing or using oil. These records must be kept on-site and available for inspection by Ecology;

   c. Provide proper containment around each storage container (including transformers) or around a combination of storage containers as appropriate. Proper containment equals the volume of the largest container plus 10 percent;

   d. Provide appropriate level markings for all oil gauges (including sight-glass gauges) to ensure Project Operators and maintenance personnel can easily identify an unusual condition;

e. Checks must be conducted during daily rounds of all fuel and lubrication hoses, oil drums, oil or fuel transfer valves and fittings, etc., for drips and leaks. Maintain and properly store them to prevent spills into state waters;

f. Inspect daily equipment containing oil and view oil-level gauges;

g. Provide full oil spill containment capacity plus 10 percent when working on oil containing equipment that might spill or drip oil.

6. Sumps

a. Visually inspect sumps weekly or immediately if an oil leak is suspected, such as in the event of an oil sump high level alarm or other visual indications that oil could reach the sump. Oil detected in the sumps may require cleanup. Reference item d) below.

b. Immediately repair oil leaks that are of sufficient volume to reach the sump and that cannot be contained by placing a container underneath the leak.

c. Provide water-proof lighting in the sump or spotlights adequate to observe oil sheens on the surface of the water in the sumps.

d. The Licensee will initiate cleaning of the sump to remove all oil and oil residue from walls, piping and other structures in contact with sump water as necessary based on the results of weekly inspections and the volume of effluent in the sump. Oil cleanup and removal of effluent will follow the procedure defined in the site SPCC.

7. Transformers

a. Within three years of the issuance of this

Certification-Order, verify that transformer containment areas are impervious and fill cracks, caulk pipe penetrations or otherwise ensure that containment areas will contain spills.

b. Transformer containment areas must be inspected during routine plant rounds and immediately following large rain events.

c. Obtain prior approval from Ecology before breaching containment areas for reasons other than containment area maintenance.

d. Conform to industry standards, use Best Management Practices or utilize other control measures for protecting water quality and preventing and containing oil spills when conducting in-place maintenance work on transformers, transporting transformers and transferring transformer oil.

8. Stormwater Pollution Prevention and Containment Area Management

a. The Licensee must use Best Management Practices or other control measures to prevent any oil-contaminated stormwater on the Project site from entering state waters.

b. Stormwater in transformer and oil-filled operating equipment containment areas must be monitored for the presence of oil. If oil is present, the oil must be removed and properly disposed of prior to draining the containment area.

c. Discharge of non-contaminated stormwater from containment areas must be recorded. Records of all stormwater removed or discharged from containment areas must be kept on-site and available for inspection by Ecology.

d. Snowy or icy conditions require close and, at minimum, daily inspection of containment areas and containment drains. Remove any observed

stormwater pooling in containment areas as per condition 8 (b)/(c).

9. Other

a. Maintain site security at the Projects to reduce chance of oil spills.

b. The Licensee must coordinate spill response planning and response efforts with other oil-handling facilities and spill response agencies on the Cowlitz River.

c. Compliance with these conditions does not relieve the Licensee from responsibility to maintain continuous compliance with terms and conditions of this Certification or resulting liability from further failure to comply.

6.1 ORDER

Any person who fails to comply with any provision of this Certification-Order No. 6499 must be liable under the Clean Water Act for a penalty of up to $20,000 per day and under the state Water Control Act, for a penalty of up to $10,000 per day per violation or such other amount as may be authorized under state law as exists now or may be amended during the term of the license.

APPENDIX B

USDA FOREST SERVICE FEDERAL POWER ACT FINAL SECTION 4(e) TERMS AND CONDITIONS[1]

Packwood Lake Hydroelectric Project
FERC Project No. 2244

General (Standard Form L-1)

License articles contained in the Federal Energy Regulatory Commission's (Commission) Standard Form L-1 issued by Order No. 540, dated October 31, 1975, cover those general requirements that the Secretary of Agriculture, acting by and through the USDA Forest Service, considers necessary for adequate protection and utilization of the land and related resources of the Gifford Pinchot National Forest. Under authority of section 4(e) of the Federal Power Act (16 U.S.C. 797(e)), the following terms and conditions are deemed necessary for adequate protection and utilization of National Forest System (NFS) lands and resources of the Gifford Pinchot National Forest. These terms and conditions are based on those resources enumerated in the Organic Administration Act of 1897 (30 Stat. 11), the Multiple-Use Sustained Yield Act of 1960 (74 Stat. 215), the National Forest Management Act of 1976 (90 Stat. 2949), and any other law specifically establishing a unit of the National Forest System or prescribing the management thereof, as such laws may be amended from time to time, and as implemented by regulations and approved Land and Resources Management Plans prepared in accordance with the National Forest Management Act. Therefore, pursuant to section 4(e) of the Federal Power Act, the following conditions covering specific requirements for protection and utilization of the NFS lands must also be included in any License issued for the Packwood Lake Hydroelectric Project (Project).

Condition No. 1 - Implementation of Activities on National Forest System Lands, Site-Specific Plans and Cost Reimbursement

[1] The Forest Service filed preliminary Conditions on August 16, 2008. On March 6, 2009, the Forest Service filed modified Condition No. 9, and re-affirmed the remaining preliminary Conditions filed March 6, 2009. Therefore, the Conditions in this Appendix are the same as those filed on August 16, 2008, with the exception of Condition No. 9.

The Licensee must not commence implementation of habitat or ground-disturbing activities on National Forest System (NFS) lands until the USDA Forest Service has approved site-specific project designs and issued a notice to proceed.

Additional NFS Lands. If additional NFS lands are included within the Project boundary, the Licensee must obtain a special-use authorization for occupancy and use of NFS lands added to the Project boundary from the USDA Forest Service. Within six months of License issuance and before any habitat or ground-disturbing activities, the Licensee must obtain from the USDA Forest Service and file with the Commission a special-use authorization for occupancy and use of NFS lands added to the Project boundary in the License.

Additional lands authorized for use by the Licensee in a new special-use authorization must be subject to laws, rules, and regulations applicable to the NFS. The terms and conditions of the USDA Forest Service special-use authorization are enforceable by the USDA Forest Service under the laws, rules, and regulations applicable to the NFS. The special-use authorization must also be subject to applicable sanctions and enforcement procedures of the Commission at the request of the USDA Forest Service. Should additional NFS lands be needed for this Project over the License term, the special-use authorization must be amended to include any additional NFS lands.

Approval of Changes on NFS Lands after License Issuance. Notwithstanding any License authorization to make changes to the Project, the Licensee must receive written approval from the USDA Forest Service prior to making changes in the location of any constructed Project features or facilities on NFS lands, or in the uses of Project land and waters on NFS lands, or any departure from the requirements of any approved exhibits for Project facilities located on NFS lands filed by the Licensee with the Commission. Following receipt of such approval from the USDA Forest Service, and at least 60 days prior to initiating any such changes or departure, the Licensee must file a report with the Commission describing the changes, the reasons for the changes, and showing the approval of the USDA Forest Service for such changes. The Licensee must file an exact copy of the report with the USDA Forest Service at the time it is filed with the Commission.

Coordination with Other Authorized Uses on NFS Lands. In the event that portions of the Project area are under federal authorization for other activities and permitted uses, the Licensee must consult with the USDA Forest Service to coordinate such activity with authorized uses before starting any activity on NFS land that the USDA Forest Service determines may affect another authorized activity.

Site-Specific Plans. The Licensee must prepare site-specific plans subject to review and approval by the USDA Forest Service for habitat and ground-disturbing activities on NFS lands affected by the Project required by the License, including activities contained

within resource management plans required by the License prepared subsequent to License issuance. The Licensee must prepare site-specific plans for planned activities one year in advance of implementation dates required by the License, except for those activities planned in the first year after license issuance where the Licensee must prepare site-specific plans for activities timely to allow USDA Forest Service review in advance of implementation. For emergency situations, where corrective or mitigation actions must be implemented immediately, the Licensee will coordinate with the USDA Forest Service to expedite approvals and/or permits.

Site-specific plans must include:

1. A map depicting the location of the proposed activity and GPS coordinates.
2. A description of the USDA Forest Service land management area designation for the location of the proposed activity and applicable standards and guidelines.
3. A description of alternative locations, designs and mitigation measures considered including erosion control and implementation and effectiveness monitoring designed to meet applicable standards and guidelines.
4. Draft biological evaluations or assessments including survey data as required by regulations applicable to habitat or ground-disturbing activities on NFS lands in existence at the time the plan is prepared.
5. An environmental analysis of the proposed action consistent with the USDA Forest Service policy and regulations for implementation of the National Environmental Policy Act (NEPA) in existence at the time the plan is prepared for FERC Licensed projects on NFS lands.

Cost Reimbursement. The Licensee must provide funding to the USDA Forest Service for all costs associated with the analysis, review, inspection, and monitoring required for implementing habitat and ground-disturbing activities on NFS lands required by the License, including activities contained within resource management plans required by the License prepared subsequent to License issuance. Funding for the analysis, review, inspection, and monitoring of site-specific projects on NFS lands required by the License must be through the use of a Collection Agreement or other instrument consistent with USDA Forest Service regulations in effect at the time the Project is proposed.

Condition No. 2 - Resource Coordination

Within one year of License issuance, the Licensee must, in coordination and consultation with the USDA Forest Service and the U.S. Fish and Wildlife Service, National Marine Fisheries Service and the Washington Department of Fish and Wildlife, Washington Department of Ecology, and Tribes, here-in-after referred to as the Parties, and approval by the USDA Forest Service, prepare a Resource Coordination Plan (RCP) and file the plan with the Commission for approval. The RCP must establish a process for information exchange and coordinate efforts for implementation of License conditions

and ongoing Project operations and maintenance (O&M) activities impacting NFS lands affected by the Project. The RCP must provide for coordination of the implementation of the various management plans required under the License to the extent they impact NFS lands affected by the Project, such as but not limited to: recreation resource management; cultural resource management; integrated weed management; road management; Threatened, Endangered and sensitive species management; facilities monitoring; erosion control and other resource protection plans. The RCP must require the Licensee to:

1. Provide for coordination and consultation with the USDA Forest Service and other Parties in the form of an Annual Resource Coordination meeting each year at least 60 days preceding the anniversary of the License.
2. Provide each year to the USDA Forest Service and other Parties a Rolling 3-Year Annual Report/Work Plan.
    a. The Rolling 3-Year Annual Report/Work Plan consists of the following elements:
        i. A Final Annual Report which documents the previous calendar year's management activities, monitoring results, and compliance with the License terms and conditions;
        ii. A Final Current Year Work Plan which describes planned activities underway or to be implemented in the current year;
        iii. A Draft Out-Year Work Plan which describes the activities planned for the following year; and
        iv. A Consultation Summary which documents annual consultation with the USDA Forest Service and other Parties. The consultation summary will include any recommendations made by the USDA Forest Service and an explanation of why any such recommendations were not accepted.
    b. A draft of the Rolling 3-Year Annual Report/Work Plan will be completed by the Licensee and be submitted to the USDA Forest Service and other Parties at least 30 days prior to the planned Annual Resource Coordination meeting. The USDA Forest Service and other Parties will review the draft Rolling 3-Year Annual Report/Work Plan, with the objectives of:
        i. Providing comments to clarify material in the Annual Report;
        ii. Discuss and approve any revisions to the Current Year Work Plan, as suggested by the Licensee based on monitoring results; and
        iii. Discuss and tentatively approving the Out-Year Work Plan
    c. The Licensee will produce the Final Rolling 3-Year Report/Work Plan and provide the USDA Forest Service and other Parties a 30 day review of the Final Rolling 3-Year Report/Work Plan. The Licensee will send copies to the Commission, the USDA Forest Service and other Parties within 60 days following the Annual Resource Coordination meeting.
3. Document the requirements, tasks and methods and reports related to monitoring the effects of Project operations and facilities on natural and/or social resources

and effectiveness of protection, mitigation, and enhancement (PME) measures where the monitoring is required by the USDA Forest Service terms and conditions.

4. Provide a mechanism for revising implementation strategies and methods to reflect improvement in sampling procedures and/or changes in regulations or environmental conditions.
5. For each resource plan developed for the Project provide a mechanism to adapt Project PME measures when resources objectives are not achieved as identified through collaborative coordination, plan development and implementation, implementation and effectiveness monitoring. Adaptive management must mean the adoption of the following strategic actions: measures must be implemented, effectiveness monitoring must take place, and alternative fallback options must be employed if proposed control measures fail to protect and enhance fish and wildlife resources as anticipated.
6. Identify practices for record keeping.
7. Include provisions for documenting and reporting any deviations from the approved plans or terms and conditions. Deviations will be reported to the USDA Forest Service within 14 days of the change date, including specific details and reasons for the change. Deviations will be documented in the Annual Report.
8. Include provisions for the routine updating of the RCP, including incorporation of monitoring measures identified in site-specific plans prepared under the requirements of USDA Forest Service Condition No. 1 (Implementation of Activities on NFS lands).
9. Develop a field manual or Project procedures that identify standard operating protocols, including cultural resource identification and reporting methods that the Licensee and its contractors must follow while conducting activities on NFS lands.
10. Develop a process to resolve disagreements regarding the implementation of the RCP.
11. Designate an Environmental Coordinator to coordinate the implementation of the RCP and Licensee activities with the USDA Forest Service.

Condition No. 3 - Fire Prevention Plan

Within one year of License issuance, the Licensee must, in consultation with and approval by the USDA Forest Service and in consultation with appropriate State and local fire agencies, prepare a Fire Prevention Plan for NFS lands within the Project boundary and NFS lands adjacent to the Project boundary that are impacted by the Project and file the plan with the Commission for approval. The Fire Prevention Plan must require the Licensee to:

1. Analyze fire prevention needs to ensure that prevention equipment and personnel are available.

2. Identify fire hazard reduction measures (e.g., eliminating ladder fuels, reducing fuel loading).
3. Provide the USDA Forest Service a list of the location of available fire prevention equipment and the availability of Project personnel.

Condition No. 4 - Packwood Lake Elevations and Annual Project Maintenance

The Licensee must maintain a minimum Packwood Lake elevation of 2856.5 feet MSL between May 1 and September 15 of each year. The goal of the lake elevation is to ensure tributary stream connectivity with Packwood Lake for spawning adult rainbow trout and fry out-migration from Packwood Lake tributaries into Packwood Lake, provide stable water levels for wetland and amphibian productivity, to keep recreational activity on the west shore of Packwood Lake at a minimum, and to maintain Packwood Lake elevations that reflect the natural hydrology.

The Licensee must perform annual Project equipment maintenance (outage) starting on August 15 of each year and must eliminate the pre-outage lake drawdown. The intent of the outage period is to complete all major maintenance, inspections and testing within one month. Project operations are anticipated to resume by September 15 when all necessary work has been completed.

Between September 16 and April 30 of each year, the minimum operating water surface elevation must be 2849 MSL feet. The goal of the minimum winter elevation is to provide sufficient water for increased instream flows into Lower Lake Creek, for uninterrupted tailrace flows after the Project maintenance outage, and continuous flows for Project generation. The Licensee must not decrease lake elevation by more than 1 ft. per day. The rate of project reservoir drawdown may be temporarily modified if required by operating emergencies beyond the control of the Licensee, and upon mutual agreement between the Licensee and the USDA Forest Service.

The Licensee must measure and record Packwood Lake elevations by utilizing accurate reliable measuring equipment. The measurements must be recorded and retained as part of the permanent plant records. The lake levels will also be recorded by the Licensee staff in the daily plant logs. The electronic lake level readings will be validated, by comparison to the physical reading taken from a staff gauge located at the intake building each week or as access allows. The Licensee must make available lake level data upon request by the USDA Forest Service and provide an annual report of the daily lake levels at the Annual Resource Coordination meeting (Condition No. 2).

Condition No. 5 - Lower Lake Creek Instream Flows

Upon license issuance and for the term of the License, the Licensee must implement and maintain the minimum instream flow regimes for Lower Lake Creek as set forth in Table

1 and the Washington Department of Ecology 401 Water Quality certification. The goal of minimum Lower Lake Creek instream flows is for the protection, mitigation, and enhancement of fish and wildlife resources and to sustain well-connected functional riparian and aquatic habitats to which the native aquatic and riparian community is adapted.

Table 1. Instream Flows (cfs) for Lower Lake Creek as measured at the drop structure.

Month	Instream Flow (cfs)
January	4
February	4
March	4
April	7
May	15
June	10
July	15
August 1 – 15	15
August 16 – September 15	20
September 16 – 30	15
October	10
November	7
December	4

The Licensee must verify and adjust bypass flow readings to meet the minimum instream flow at least twice each day from the powerhouse control room. The bypass flow into Lower Lake Creek is to be measured at the bypass pipe discharge point in the stilling basin immediately below the drop structure. The Licensee must make available instream flow data upon request by the USDA Forest Service and provide an annual report of daily instream flow at the Annual Resource Coordination meeting (Condition No. 2).

Condition No. 6 - Aquatic Habitat Forming Flows

The Licensee must provide aquatic habitat forming flows in Lower Lake Creek greater than or equal to 285 cfs for a target of 24 hours, or as long as lake inflows can sustain that flow, every other water year[2] or 3 out of 6 water years, starting in the first water year after issuance of the new license and continuing for the life of the new License. The Licensee must take the necessary measures to adjust Packwood Lake elevation and power generation to ensure that aquatic habitat forming flows are achieved and maintained for up to a maximum 24 hours. If the desired flow can not be achieved and maintained for the target period, the Licensee must file with the Commission the reasons for not meeting

[2] Water year is defined as an annual precipitation cycle, October 1 through September 30.

the stated objective, based on Project-specific information. The Licensee must be given credit for flow events that occur outside of the Licensee control that meet the flow and duration criteria describe above. If the desired frequencies of the aquatic habitat forming flows cannot be achieved, the USDA Forest Service will be consulted to discuss alternative operational means to achieve the stated objective

The objective of aquatic habitat forming flows is to provide flows of sufficient magnitude, duration, and frequency in order to sustain habitat forming and maintenance processes in Lower Lake Creek during the operation and maintenance of the Packwood Lake Hydroelectric Project. Some of these processes include the recruitment, mobilization, and deposition of sediment, wood and other organic material.

The Licensee must monitor aquatic habitat forming flows at the drop structure and record the bypass flow and spill flow over the drop structure at appropriate time intervals. The magnitude of flows will be calculated by adding the measured bypass flows to the spill flows over the drop structure, as calculated from lake elevation, using the stage/discharge relationship established for the drop structure. The Licensee must record the spill flow at the start of the event and every two hours while the station is manned. The lake level and time will be marked on the chart recorder as well as recorded in the daily plant log. The recoding will resume at the start of each subsequent shift and continue until the event is over.

The Licensee must provide the USDA Forest Service an annual report on aquatic habitat forming flow attempts and activities including the magnitude, duration, and frequency of these flows and associated power generation throughout the past year, 30 days prior to the Annual Resource Coordination meeting. The annual report must also provide details for the out-year planned activities. The Licensee must allow a minimum of 60 days for the USDA Forest Service to comment and to make recommendations prior to filing the final report with the Commission for approval. If the Licensee does not adopt a recommendation, the filing must include the Licensee's reasons, based on Project-specific information.

Condition No. 7 - Lower Lake Creek Stream Restoration and Monitoring

Within two years of License issuance, the Licensee must, in coordination and consultation with the USDA Forest Service, U.S. Fish and Wildlife Service, National Marine Fisheries Service and the Washington Department of Fish and Wildlife, Washington Department of Ecology, and Tribes, and with approval by the USDA Forest Service, prepare a Lower Lake Creek Stream Restoration, Enhancement and Monitoring Plan for the portion of the Anadromous reach up to RM 1.0 and the upper reach of Lower Lake Creek extending from drop structure to about 1,464 ft downstream (RM 5.1 - 5.3), and file the plan with the Commission for approval. The primary goal of the plan is to restore and enhance anadromous and resident salmonid habitat in Lower Lake Creek by

increasing rearing and spawning habitats. The primary objective for the Anadromous reach is to convert the existing plan-bed/step-pool channel into a wood and boulder forced step-pool system that more accurately reflects the natural channel form, function and processes appropriate for this reach. The primary objective for the isolated reach of Lower Lake Creek 1,464 ft below the drop structure is to increase small woody structure and spawning gravels for resident rainbow trout.

The Lower Lake Creek Stream Restoration, Enhancement and Monitoring Plan must use the following objectives and design criteria as the basis for Plan development. However, if reach-specific assessment data indicate adjustments that will maximize the primary objectives, the objectives and design criteria may be modified. Any modifications to the objectives and design criteria will be determined in coordination and consultation with the natural Resource Agencies and Tribes.

Anadromous Reach

Rearing Habitat Objectives:

- Increase the number of pools in lower Lake Creek to represent approximately 30% of the available stream habitat.
- Improve the rearing habitat found in the remaining runs and glides by approximately 15,300 ft^2
    - Increase salmonid rearing habitat in the Reach from RM 0.0 – 0.3 by approximately 2,700 ft^2 , and
    - Increase salmonid rearing habitat in the Reach from RM 0.3 – 1.0 by approximately 12,600 ft^2

Spawning Habitat Objectives:

- Increase the number of pool and pool tail-outs.
- Place gravel into the pool tail-outs of appropriate size for salmon and trout spawning.
- Increase spawning habitat in the reach by approximately 1,700 ft^2 (+/- 10%).
    - Increase salmonid spawning habitat in the Reach from RM 0.0 – 0.3 by approximately 300 ft^2 and
    - Increase salmonid spawning habitat in the Reach from RM 0.3 – 1.0 by approximately 1,400 ft^2

Phased approach to restoring geomorphic functionality:

- Shaping the channel to ensure that the 1.5 year recurrence interval flows (285 cfs) fill the channel to its morphological bankfull stage,
- Restore channel complexity and roughness factors (e.g., boulders and large wood), and
- Add bed material that can be partially mobilized at bankfull flow.

Geomorphic Objectives, Design Elements and Structural Criteria:

- Convert a degraded plane-bed/step-pool system into a wood forced step-pool system; construct pool-forming bedforms (steps) using boulder and wood complexes; and increase instream habitat cover and complexity. All placed wood should be conifer species native to the area.
    - Within RM 0.3 – 1.0, increase wood quantities from an existing 30 pieces/mile to 90-130 pieces/mile. Use the Large Wood Report (Watershed Geodynamics 2007) to determine size class distribution (small, medium and large). Target areas for wood placements will be in existing pools or in glides/runs where pool habitat can be created by wood placement. In areas targeted for pool formation, large 'key' pieces of wood will be incorporated into the channel bed to create stable poolforming bedforms (i.e. steps).
    - Within RM 0.0 – 0.3, place boulders to help develop step-pool units and complexity. Boulder target densities and distribution will be determined during plan development.
    - Within RM 0.3 – 1.0, place large wood structures approximately every 250 feet, or about 15 structures in the target reach. Place boulders into the large wood structures to increase complexity, help to develop step-pool channel units and to provide ballast for large wood placements.
    - Wood accumulations will be installed within channels and along channel margins to create and enhance pool habitat and to provide cover. Wood quantities and jam spacing will be based on reference conditions within Lake Creek and other similar streams. Wood will be placed to create plunge pool and lateral scour pool habitat as appropriate depending on site conditions.
    - Anchoring of boulders, logs and log structures and recurrence interval event (flow event large enough to move the structures) will be determined during plan development and based on site-specific analysis. Use of cables, re-bar, and similar anchoring devices must be approved by the Agencies, based upon the goals of restoring geomorphic functionality, complexity and roughness factors, and included during plan development.
- Convert current glide habitat into high quality pool habitat
    - Decrease glide/run habitat to 30%
- Increase residual pool depths to increase habitat capacity during low flow periods
    - Decrease channel width-to-depth ratios to below 15:1 and where feasible below 10:1 (current width-to-depth ratios regularly exceed 30:1) by reshaping selected channel unit areas.
- Increase available spawning habitat through gravel augmentation o
    - Lower Lake Creek Reaches 2 – 4 will provide targets for gravel quantities in surface area, which are on the order of 10,000 ft2 per mile. This corresponds to approximately 7,000 ft2 of gravel in surface area to be maintained for the life of the License for the target anadromous reach. The

amount of gravel in cu. yds will need to be determined during Plan development and be based on the required spawning substrate depth.
- Increase spawning area by increasing availability of pool tail-outs and through spawning gravel augmentation.
- Spawning gravel placement should occur at key channel access points and be associated with placed logs, log jams or boulders to ensure they are not readily transported out of the reach. Placement guidelines may include pool tail-outs where water depths and velocities meet spawning criteria.
- Gravels will be placed upstream of bed control elements (i.e. riffles, steps) to enhance spawning capacity and quality.
- Specific size and distribution of bed material will be determined through hydraulic analysis, reference conditions, and species requirements for spawning.
- Continue a long-term gravel supplementation program that match post-restoration transport capacity and maintain habitat features consistent with restoration goals and objectives (maintain long term recruitment stations which work with the stream and naturally transports gravels to suitable locations).

Riverine Riparian Habitat – Currently, the riparian areas are mostly composed of native deciduous or mixed deciduous / conifer stands. There are a few cases of invasive species that would be expected to interfere with natural succession to climax forest types. A vegetation monitoring and management program will be put in place to ensure invasive species do not colonize the site and that native riparian habitats provide the form, function and natural processes. Impacts to existing riparian vegetation will be minimized during construction activities. Revegetation will be conducted in disturbed areas using native and site-appropriate species.

Implementation and Effectiveness Monitoring – The Licensee must in coordination and consultation with the USDA Forest Service, develop protocols and determine the temporal expectation for change for each monitoring element and identify other implementation and effectiveness monitoring elements, as needed, to track the status of resource objectives. The Licensee must provide the USDA Forest Service a report of the Anadromous Reach monitoring findings each year at the Annual Resource Coordination meeting (Condition No. 2) and very year thereafter. Monitoring conducted by the Licensee must address:

- Select monitoring parameters, or indicators, that best display the current condition and dynamics of the system being managed (Gibbs et al. 1999). Give preference to indicators that not only demonstrate the existence of change, but which can also be linked to the cause of change.
- Determine the monitoring intensities needed to obtain sufficient data to have a reasonable chance of detecting change in habitats or populations.

- Prior to initiating site-specific monitoring establish baseline biological conditions for the resources that will be monitored by using existing data and information, and/or collecting new data through appropriately designed field surveys.
- Where appropriate, use monitoring to test specific hypotheses related to resource objectives or implementation measures. Define site-specific resource objectives that are both realistic and measurable and that include the following components (Elzinga et al. 1998):
    - What will be monitored,
    - The geographic scope of the monitoring,
    - The specific metric of the indicator that will be measured,
    - The anticipated response to the management action,
    - The magnitude of change anticipated, and
    - The anticipated time frame over which the response should occur.
- Establish and maintain a staff and gauging station at the Lake Creek Old Highway Bridge to monitor flows in the reach. The Licensee must check the gauge and download data to website and provide a report at Annual Resource Coordination meeting (Condition No.2).

<u>The Upper Reach of Lower Lake Creek, extending from the drop structure to about 1,464 ft downstream</u>

Spawning and Rearing Habitat Objective:

- Increase the amount of small woody structure and spawning gravels for resident rainbow trout in reach.

Within one year of License issuance, the Licensee must conduct baseline surveys of spawning and rearing habitat in reach. Beginning within the first year after License issuance and after the baseline survey, the Licensee must collect wood from the Project intake and wind-throw along USDA Forest Service Trail 74 that can be handled safely by two Energy Northwest employees, and that are in excess of six feet in length and 4 inches in diameter, and must place the collected wood in the reach for the term of the new License.

The Licensee must deposit 10 cubic yards of variable diameter gravel (between 0.5 and 3.0 inches diameter) onto an exposed bank within the bankfull channel in the first year of the new License. The specific amount of gravel and duration of augmentation will be determined in consultation and coordination with the Resource Agencies and Tribes, and incorporated into the Lower Lake Creek Stream Restoration, Enhancement and Monitoring Plan. The Licensee must deposit the next gravel amount within 6 months after the gravel has been dispersed by the aquatic habitat forming flow or flows that move the gravel. The Licensee must provide annual documentation to the USDA Forest Service of the following specific elements:

- Length of wood deposited into Lake Creek (cumulative linear feet)
- Diameter of wood deposited
- Number of pieces of wood deposited
- Type of wood deposited
- Dates of gravel and wood deposits

The Licensee must monitor the amount of spawning and rearing habitat present (in square meters) once every two years for ten years after issuance of the new License. The monitoring must be conducted concurrently with the monitoring outlined in Condition No. 8. During each monitoring period, the Licensee must quantify the amount of spawning and rearing habitat present in the upper reach of Lower Lake Creek. The Licensee must provide the USDA Forest Service with a report of monitoring findings at the Annual Resource Coordination meeting (Condition No. 2) the year after the monitoring is conducted. The report will discuss the quantity of rearing and spawning habitat for resident rainbow trout in the reach, and trends that become apparent over time.

The Licensee must monitor the amount of spawning and rearing habitat present (in square meters) once every two years for ten years after issuance of the new License. The monitoring must be conducted concurrently with the monitoring outlined in Condition No. 8. During each monitoring period, the Licensee must quantify the amount of spawning and rearing habitat present in the upper reach of Lower Lake Creek. The Licensee must provide the USDA Forest Service with a report of monitoring findings at the Annual Resource Coordination meeting (Condition No. 2) the year after the monitoring is conducted. The report will discuss the quantity of rearing and spawning habitat for resident rainbow trout in the reach, and trends that become apparent over time.

Upon completion of the ten year monitoring period, the Licensee must meet with the USDA Forest Service to discuss monitoring results. If significant habitat improvement is documented, a collective decision will be made as to the quantity and duration of gravel and wood placement into the reach for future years and whether further monitoring is warranted. Conversely, if anticipated improvements to instream habitat are not occurring, increases in the amount of gravel and wood placement or other gravel trapping structures will be discussed.

Required Elements for both Reaches

Adaptive Management - The Licensee must in coordination and consultation with the USDA Forest Service, modify the PME measures, as needed, to meet resource-specific objectives and/or desired conditions.

- Analyze the data generated from monitoring and evaluate changes in condition and progress toward meeting resource management objectives. As needed, obtain outside peer review of the monitoring results to assist in developing and evaluating adaptive management actions.

- Adaptive management must mean the adoption of the following strategic actions: measures must be implemented, effectiveness monitoring must take place, and alternative fallback options must be employed if proposed control measures fail to protect and enhance fish and wildlife resources as anticipated.

USDA Forest Service consultation requirements - The Lower Lake Creek Stream Restoration, Enhancement and Monitoring Plan must be prepared in coordination and consultation with the USDA Forest Service. The Licensee must include with the plan documentation of coordination/consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the plan. The Licensee must allow a minimum of 60 days for the USDA Forest Service to comment and to make recommendations prior to filing the plan with the Commission for approval. If the Licensee does not adopt a recommendation, the filing must include the Licensee's reasons, based on Project-specific information.

Future plan review –The Licensee must in coordination and consultation with the USDA Forest Service review, update, and/or revise as needed the Lower Lake Creek Stream Restoration, Enhancement and Monitoring Plan every 5 years. The initial 5-year update to the plan will be completed the tenth year after issuance of the new License and will be filed in 2020. The updated or revised plan will document the consultation process. The Licensees will submit 5- year plan updates to FERC by the end of each calendar year (December 31) in which the review and updates occur, with copies sent to the USDA Forest Service. Changes or revisions to the plan would be expected if aquatic and/or terrestrial resource conditions change as a result of unforeseen effects from new or existing Project-related activities or from natural events. Changes may also be implemented if monitoring feedback indicates that resource objectives are not being met and/or it is determined that a specific PME is not providing the intended result and needs to be revised or replaced.

Condition No. 8 - Rainbow Trout Surveys and Supplementation in the Upper reach of Lower Lake Creek extending 1,464 ft below the Drop Structure

Within one year after License issuance and before the first aquatic habitat forming flow event, the Licensee must provide baseline information on the rainbow trout population density in this reach. The Licensee must conduct the survey in the reach to provide the baseline information and once every two years for eight years. The goal of the surveys is to obtain adult rainbow trout population density in the reach. If 30 adult rainbow trout are not observed, the Licensee must collect and move 30 healthy, adult rainbow trout from Packwood Lake to the reach during the year following each survey. If 30 or more adult rainbow trout are observed during the survey, the Licensee does not need to collect or move any trout.

Upon completion of the surveys during the first eight years after License issuance, the Licensee must meet with the USDA Forest Service to discuss and collaboratively decide whether to continue fish supplementation and monitoring. The following criteria will be used to determine whether supplementation and monitoring be continued as is, modified or will be discontinued.

- If three consecutive bi-annual surveys of the reach have confirmed the presence of 30 adult rainbow trout, and a subsequent survey of Study Reaches 3 and 4 documents a self sustaining resident population in these two reaches then monitoring and supplementation in the reach will be discontinued for the remainder of the License period.
- If three consecutive surveys have not confirmed the presence of 30 adult rainbow trout then the Licensee must continue to monitor the reach at a reduced frequency of once every four years and supplement the trout annually, or until 3 consecutive surveys document the presence of 30 adult rainbow trout.

The Licensee must collect scale samples during the surveys to monitor trends of fish age class variability within the reach.

The Licensee must provide the USDA Forest Service a report every two years documenting the adult rainbow trout population supplementation and monitoring efforts in the reach. The report must discuss the existing population characteristics of the resident adult rainbow trout in the reach. The report must be provided to the USDA Forest Service 30 days prior to the Annual Resource Coordination meeting (Condition No.2). The report must also provide details for the out-years planned activities. The Licensee must allow a minimum of 60 days for the USDA Forest Service to comment and to make recommendations prior to filing the final report with the Commission for approval. If the Licensee does not adopt a recommendation, the filing must include the Licensee's reasons, based on Project-specific information.

Condition No. 9 - Entrainment in Project Intake

The Licensee must, in consultation and coordination with and subject to review and approval by the USDA Forest Service, develop a Packwood Lake Intake Fish Entrainment Monitoring Plan within 3 months of issuance of the new license. The goal of the monitoring plan is to determine whether intake traveling screen approach velocities in excess of the State of Washington criteria cause detrimental impacts to the rainbow trout population in Packwood Lake. The objectives of the monitoring plan are to; accurately describe and enumerate the rainbow trout population size distribution in Packwood Lake; identify and record all fish impingement and mortality on project traveling screens; determine impingement decay rates; and to examine fish behavior in the intake wells and the forebay immediately in front of the intake. The monitoring plan must be implemented annually for the first 5 years of the new license. Subsequent monitoring frequency and

actions will be dependent upon the results of the initial monitoring period, and collectively agreed upon between the Licensee, USDA Forest Service, and other interested parties. The Licensee must be responsible for all costs related to the development and implementation of the monitoring plan.

At a minimum the Packwood Lake Intake Fish Entrainment Monitoring Plan must include the following elements:

- Identify the monitoring plan goals and identification of measurable objectives;
- Develop impingement criteria included but not limited to: estimates of total population of rainbow trout in the lake, total fry in each monitored cohort, and identification of a threshold level of allowable mortality associated with the intake screen. For the initial five year sampling period, no more than 1.5% of the total Packwood Lake rainbow trout population in the lake must be injured or killed as a result of impingement on the intake screen;
- Specify roles and responsibilities of all involved parties;
- Implement screen maintenance and modification; operation (traveling screen rotation: auto vs. manual) and placement and configuration of the removable outer debris screen;
- Recommended inspection and cleaning frequency for the forebay area;
- Evaluate proposed stop log placement at the entrance to the removable debris screen;
- Observation monitoring methods for fish movement in the intake wells and forebay (including but not limited to underwater cameras) and recommended timing and frequency of observation;
- Test the persistence of dead fish impinged on the traveling screens considering the natural decay rates and the effects of scavengers feeding at the intake system (including but not limited to crayfish and fish scavenging);
- Identify methods for traveling screen impingement and mortality examination;
- Determine whether mortality was caused by impingement or did mortality occur prior to impingement;
- Monitor the Packwood Lake rainbow trout population using the methods which could include: hydroacoustic sampling and frequency; tributary spawning surveys (including identification of frequency of surveys, tributary and reach selection, counts of redds and adult fish); and out-migrant tributary trapping to estimate fry densities in the lake. The intent is to obtain a high detection rate (80% to 95%) for juvenile and adult trout in the lake;
- Monitoring method data analysis used to estimate lake population density;
- Methods to adapt impingement criteria during the life of the license if the rainbow trout population in Packwood Lake decreases significantly as determined by monitoring;
- Required actions if impingement threshold is exceeded in any monitoring period;

- Schedule for implementation; agency coordination requirements and preparation of draft and final reports.

Each year's monitoring results will be reported to the USDA Forest Service and other interested parties for review and comment prior to the beginning of subsequent years of monitoring and within 90 days of completion of the year of observation. The annual monitoring reports will be discussed at the Annual Resource Coordination meeting (Condition No. 2). The draft final report summarizing the results from the five year initial monitoring period will be submitted to the USDA Forest Service at the end of the fifth year for a 60-day review and comment, and discussed at the Annual Resource Coordination meeting prior to filing with the Commission.

The 1.5% threshold for Project related impingement mortality will be re-evaluated (and potentially reduced) if the Packwood Lake rainbow trout population suffers a stochastic event between monitoring periods.

At a minimum the annual and final reports will summarize all activities undertaken during the monitoring period including;

- Estimates of Packwood Lake rainbow trout population density by size class,
- Impingement rates by size class,
- Timing of impingement,
- Decomposition rates,
- Analysis of impingement, timing and decomposition rates by size class,
- Lake levels and intake flows,
- Video or visual monitoring of fish movement or behavior, and
- Summaries of previous years monitoring and an analysis of any trends observed relative to the fish population, and
- Information on effectiveness of any modifications made at the intake debris screens or traveling screens.

If the impingement criteria identified in the monitoring plan for all size classes are satisfied after the initial 5-year monitoring period then Licensee will retain the existing traveling screen facility and operational mode as the primary fish exclusion device for a period to be determined collectively between the Licensee, USDA Forest Service and other interested parties based on the initial 5-year monitoring program results. At this time, a revised monitoring plan will be developed cooperatively among the parties identifying appropriate methods, monitoring schedules and impingement thresholds. At the commencement of the next monitoring period, this revised monitoring plan must be implemented for 1 or more years (to be determined by the parties) to examine whether the traveling screens are continuing to meet identified impingement criteria. New impingement criteria will be determined at the beginning of each new monitoring cycle and based on the estimated Packwood Lake rainbow trout population density.

If the impingement criteria are met then the Licensee must prepare an intake structure operation manual for USDA Forest Service approval within one year after filing the final monitoring report. The manual will specify screen monitoring intervals, maintenance intervals, and the actions that will be taken given significant events, including load rejection, overtopping flows over the drop structure, bypass flow failures, penstock leaks, landslides, earthquakes and fires.

If the monitoring data indicate the modifications made at the intake structure do not meet the impingement criteria identified in the monitoring plan then the Licensee must modify the existing fish screens and/or evaluate implementing administrative controls (restricting operational flows through the screens) to meet State Criteria prior to subsequent monitoring years. The Licensee in consultation with the USDA Forest Service and other interested parties will determine at this time whether to experiment with a baffling system and other minor modifications (including limiting inflow at certain lake elevations), or pursue a major screen redesign.

If a baffling system or other minor modification is selected in years four or five of the initial monitoring program (or any year thereafter), then the monitoring plan will be extended for at least two more years to test the modifications and will be completed by the end of the second year from modification completion. If the impingement criteria are satisfied by a baffling system or other modification then the Licensee must prepare the intake structure operation manual described above. If the impingement criteria are not satisfied after one modification to the screens then the Licensee must provide for a major redesign of the traveling fish screens to meet Washington State Fish Screen Criteria.

Major Fish Screen Redesign: A major screen redesign may mean significant changes to the existing screens or replacement of the existing screens. The Licensee must consult with qualified engineers to explore options for screening that will satisfy Washington State approach velocity criteria, then in consultation with the USDA Forest Service and other interested parties, determine the new screen design. The timeline for the redesign process is as follows:

- Proposed conceptual designs will be made available to USDA Forest Service and other interested parties within one year after it is determined the existing intake structure does not meet impingement criteria.
- Final design decision will be made one year after the conceptual designs are approved.
- Construction is to be completed by three years after the final design decision.

The Licensee must provide the USDA Forest Service an annual report on all elements described above at least 30 days prior to the Annual Resource Coordination meeting (Condition No. 2). The Licensee must allow a minimum of 60 days for the USDA Forest Service to comment and to make recommendations prior to filing the final report with the

Commission for approval. If the Licensee does not adopt one or more of the USDA Forest Service recommendations, the filing must include the Licensee's reasons, based on Project-specific information.

Condition No. 10 - Fish Passage at Snyder Creek

Within two years of License issuance, the Licensee must, in coordination and consultation with the USDA Forest Service, U.S. Fish and Wildlife Service, National Marine Fisheries Service and the Washington Department of Fish and Wildlife, Washington Department of Ecology, and Tribes, and approval by the USDA Forest Service survey, engineer, and prepare a Snyder Creek Restoration, Enhancement and Monitoring Plan for the re-routing of Snyder Creek and file the plan with the Commission for approval. The Licensee must in coordination and consultation with the USDA Forest Service and other agencies as appropriate, develop the Snyder Creek Restoration, Enhancement and Monitoring Plan to include at a minimum the following elements: restoration and enhancement objectives; project design criteria; and implementation and effectiveness monitoring.

The Licensee must apply for and secure permits by the end of the fourth year after License issuance. Within five years of License issuance, the Licensee must re-route Snyder Creek to join Hall Creek immediately downstream of the Project tailrace flume. Snyder Creek will be rerouted to Hall Creek via an existing drainage path that runs parallel and adjacent to the tailrace. This reach is approximately 800 feet in length.

The Licensee must retain stream restoration specialists to design the re-route and restoration for Snyder Creek. The point at which Snyder Creek will be diverted into this drainage will be determined in consultation with the USDA Forest Service and other agencies as appropriate however, it is anticipated that the stream will be diverted within 500 feet upstream of where the current Snyder Creek crossing occurs. Until Snyder Creek is redirected, the Licensee must keep the existing culvert under the tailrace maintained and in operating condition to allow existing fish passage.

The Licensee must monitor the re-route of Snyder Creek for two years following the restoration to determine whether Snyder Creek allows for volitional passage of anadromous and resident trout species. Upon the completion of the second year of monitoring, the Licensee must meet with the USDA Forest Service and other agencies as appropriate, to discuss monitoring results. If volitional passage of anadromous and resident trout species is documented then a collective decision will be made whether further monitoring is warranted. Conversely, if volitional passage is not occurring then a collective decision will be made as to what measures are required to restore volitional passage the Snyder Creek re-route.

The Licensee must allow a minimum of 60 days for the USDA Forest Service to comment and to make recommendations on the restoration plan prior to filing the final

plan with the Commission for approval. If the Licensee does not adopt a recommendation, the filing must include the Licensee's reasons, based on Project-specific information.

Condition No. 11 - Amphibian Monitoring at Site B

Within in the first year after License issuance, the Licensee must monitor the lacustrine fringe wetland habitat at the head of Packwood Lake known as Site B for northwestern salamander larvae presence and to determine whether the larvae are able to move into the lake after the annual September 16 change in minimum lake elevation or if there is a physical barrier to their movement.

The Licensee must monitor Site B as follows:

1. Monitoring for larvae must begin prior to September 16 when winter operating lake levels are in effect, a. Detection methods must include the use of dip-net and/or aquatic funnel traps to record the number and size (snout-vent length) of larvae found.
2. Following the annual drawdown, Site B will be re-visited:
    a. If Site B is not dewatered, the site will again be sampled for larvae using the above detection methods;
    b. The topography of the site will be documented by field notes and photographs, and the depth of any remaining water within Site B will be measured; and
    c. The outlet of Site B to the lake will be examined to determine whether there is a barrier to larval movement into the lake (i.e., do logs screening Site B from the lake and a sill of accumulated sediments block movement).

The Licensee must in coordination and consultation with the USDA Forest Service, review the monitoring results at the forthcoming Annual Resource Coordination meeting (Condition No. 2). If the results show that there is not a physical barrier to northwestern salamander larval movement into Packwood Lake, the next phase of monitoring would not be required.

If the first year monitoring demonstrates that northwestern salamander larvae are unable to move into the lake to survive winter operating levels, the Licensee must conduct a second year of monitoring to determine the relative importance of Site B to the local population of the species. A post-breeding (probably late May) survey for northwestern salamander egg masses will be conducted in Site B and in the wetland complex southeast of the lake. Because northwestern salamander egg masses are large and conspicuous, a survey at this time would have the highest probability of detection. Two biologists will systematically survey wetlands up to 0.5 miles from the Packwood Lake and will record the number and location of egg masses. If the survey indicates that the number of northwestern salamander egg masses at Site B is 10% or less than the number of egg

masses found elsewhere, no further action will be required. If Site B is found to be relatively more important, then Licensee must consult with the USDA Forest Service regarding appropriate habitat improvements (e.g., reconfiguring Site B to improve connectivity to the lake).

Condition No. 12 - Threatened, Endangered and Sensitive Species

Within one year of License issuance, the Licensee must, in coordination and consultation with the USDA Forest Service prepare a Threatened, Endangered (Federal listed) and USDA Forest Service Regional Forester Special Status Species Management Plan (Plan) that must be filed with the Commission for approval. The goal of the plan is to provide PME and monitoring of threatened, endangered, and sensitive species and their habitats that may be affected by Project operation or Project-related activities over the life of the License. The TES Plan must include the Licensees filed Rare Plant Management Plan filed with the Commission on June 6, 2008. The Plan at a minimum must require the Licensee to:

1. Initial species list - The initial list should include threatened, endangered and sensitive species that occur within the project boundary or on lands affected by project operation or project-related activities. For each species, the list should reference the relicensing studies that documented occurrence and/or evaluated project effects.
2. Updating the species list - The plan should provide for annual consultation, review, and updating of the list. Species would be added or removed according to changes in their status or changes in the potential for project effects (e.g., construction of new facilities).
3. Conducting baseline surveys - The plan should provide for baseline surveys of species currently on the list if no surveys have been completed at sites where project operations or project-related activities could affect them. Baseline surveys should also be conducted for species that may be added to the list if they occur at sites where the project could affect them.
4. Preparing biological evaluations - Where USDA Forest Service Regional Forester Special Status Species may be affected, the Licensee must consult with the USDA Forest Service to prepare a draft biological evaluation, in accordance with the Condition No. 1 - Implementation of Activities on National Forest System Lands.
5. Monitoring project effects - For USDA Forest Service Regional Forester Special Status Species, the plan should include monitoring to identify project effects at confirmed sensitive species sites every 2 years for 6 years following License issuance and at 3-year intervals thereafter, unless a determination can be made at year 6 that no additional monitoring is necessary. For other threatened, endangered, and sensitive species, the Licensee must consult with the USDA Forest Service to determine an appropriate monitoring frequency, based on site-specific conditions.

6. Implementing protective measures - The plan should provide for designing and implementing PME or restoration measures if monitoring results show project-related effects.
7. Effectiveness monitoring and adaptive management - The plan should include follow-up monitoring to measure the effectiveness of any protective measures that are implemented, and use of this information to modify and improve the Threatened, Endangered, and Sensitive Species Management Plan. Adaptive management must mean the adoption of the following strategic actions: measures must be implemented, effectiveness monitoring must take place, and alternative fallback options must be employed if proposed control measures fail to protect and enhance fish and wildlife resources as anticipated.
8. Consultation, reporting, and updating the Threatened, Endangered, and Sensitive Species Management Plan - The plan should provide for annual reporting and consultation, with updates to the plan as needed. The report must be provided to the USDA Forest Service 30 days prior to the Annual Resource Coordination meeting. The report must also provide details for the out-years planned activities. The Licensee must allow a minimum of 60 days for the USDA Forest Service to comment and to make recommendations prior to filing the final report with the Commission for approval. If the Licensee does not adopt a recommendation, the filing must include the Licensee's reasons, based on Project-specific information.

Condition No. 13 - Packwood Lake Tributary Headcutting Monitoring

Within five years of License issuance, the Licensee must develop in consultation with the USDA Forest Service, a Packwood Lake Tributary Headcutting Monitoring program. The monitoring program will focus on two tributaries to Packwood Lake: Mueller and Upper Lake Creeks. The initial monitoring will occur at year 10 of the new license (2020) and every 10 years thereafter. The monitoring program must employ the same data collection methods as implemented in the Stream Connectivity in Packwood Lake Tributaries Study Plan (Energy Northwest 2005). Monitoring data will be analyzed to determine whether headcutting and/or bed profile incision in Mueller and Upper Lake Creeks are occurring and whether headcutting/incision is Project related. Monitoring results will be provided to the USDA Forest Service at the Annual Resource Coordination meeting (Condition No. 2) the year following the monitoring.

If headcutting and/or bed profile incision is occurring and is Project related then the Licensee in consultation with the USDA Forest Service must determine appropriate mitigation measures, and monitoring and adaptive management strategies.

Adaptive management must mean the adoption of the following strategic actions: measures must be implemented, effectiveness monitoring must take place, and

alternative fallback options must be employed if proposed control measures fail to protect and enhance fish and wildlife resources as anticipated.

Condition No. 14 - Recreation Management

The Licensee must completely and fully comply with all provisions of the Recreation Management Plan as filed with the Commission on June 6, 2008 and any approved revisions of that Plan throughout the length of the new License.

The Recreation Plan addresses Project-related recreation resources located on NFS lands within the existing Project boundary and other lands affected by the Project or as otherwise ordered by the Commission. The Recreation Plan includes provisions for adaptive management to address changing recreation needs and preferences, and must be updated as appropriate every six years in conjunction with filing the Commission Form 80. The Licensee must implement the Recreation Plan.

Condition No. 15 - Pipeline, Surge Tank and Penstock Monitoring

Within one year of License issuance, the Licensee must, in consultation with and approved by the USDA Forest Service prepare a Pipeline, Surge Tank and Penstock Monitoring Plan and file the plan with the Commission for approval. The goal of the plan is to provide protection to NFS lands from Project waterway system leakage or failure. The plan must:

1. Document the requirements, tasks, methods and reports related to monitoring the Project waterway system.
2. Document detailed technical descriptions of monitoring methods and data analysis and techniques necessary for the Licensee to conduct specific monitoring tasks.
3. Provide a mechanism for revising monitoring strategies and methods to reflect improvement in sampling procedures and/or changes in regulations or environmental conditions.
4. Identify practices for record keeping and reporting.
5. Include provisions for the routine updating of the monitoring plan, in consultation with and approved by the USDA Forest Service, and subsequent filing with the Commission.

Condition No. 16 - Exotic and Invasive Vegetative Management

The Licensee must completely and fully comply with all provisions of the Integrated Weed Management Plan (IWMP) as filed with the Commission on June 6, 2008 and any approved revisions of that Plan throughout the length of the new License. The intent of the IWMP is to enhance and promote the coordinated management of noxious weeds with the entities responsible for weed management in the Project vicinity. The goal of the IWMP is for the prevention, suppression, containment,

eradication, and/or control, according to goals by species and location, for exotic invasive non-native plant species, including noxious weeds on National Forest System (NFS) lands affected by the Project and/or related to compliance activities under the Project License in and adjacent to the Project area.

Condition No. 17 - Raptor Protection - Primary Distribution Line

The Licensee must completely and fully comply with all provisions of the Avian Protection Plan file with the Commission on June 6, 2008 and any approved revisions of that Plan throughout the length of the License. The plan provides for surveys that determine system configuration and monitors the effects on avian species, including potential fatalities. Annual surveys of noncompliant structures will continue until the upgrade or replacement occurs consistent with current Avian Power Line Interaction Committee configuration standards.

Condition No. 18 - Cultural Resources

The Licensee must completely and fully comply with all provisions of the August 30, 2007, Historic Properties Management Plan (HPMP) as filed with the Commission and any approved revision of that Plan throughout the length of the new License. The HPMP provides for the protection, management, and interpretation of historic properties within the area of potential effect (APE) for the Project and for mitigation of Project-related impacts to historic properties.

Condition No. 19 - Reservation of Authority

The Licensee must implement, upon order of the Commission, such additional conditions as may be identified by the Secretary of Agriculture, pursuant to the authority provided in Section 4(e) of the Federal Power Act, as necessary for the adequate protection and utilization of the public land reservations under the authority of the USDA Forest Service.

APPENDIX C

NMFS SECTION 18 PRESCRIPTION

Packwood Lake Hydroelectric Project
FERC Project No. 2244

Article 1: Maintain and operate fish screen at project tailrace outlet

To ensure that this screen remains functional for the duration of the proposed license, the licensee must take the measures for maintenance, testing and operation of the screen as described in the Incidental take statement of the Biological Opinion on Construction, Post-construction Monitoring and Evaluation of a Tailrace Barrier at Packwood Lake Hydroelectric Project, FERC Project No. 2244 (MNFS, 2007)

Rationale:

Large numbers of juvenile salmonids (primarily LCR coho with smaller numbers of Chinook and steelhead) and smaller numbers of adult salmonids were observed in and recovered from the Project stilling basin (FERC, 2007). Salmonids were also observed and captured in the lined portion of the Project tailrace (FERC, 2007). These fish were at risk of injury or mortality 10 from contact with Project equipment and facilities. Fish present in the stilling basin and tailrace were also subject to stranding or suffering the effects of degraded water quality when flows are interrupted during project shutdowns (planned and unplanned). Based on these findings plans for a fish screen facility to exclude fish from the project tailrace and stilling basin were developed and the facility was constructed in the fall of 2007

Article 2: Ensure adequate fish passage conditions at tailrace channel crossings

Within two years of license approval, the licensee must develop and implement a plan to provide adequate passage, that meets NMFS fish passage standards (NMFS, 2004), at the Snyder Creek crossing of the lined tailrace. The licensee must receive NMFS approval of the Plan before submitting it to FERC for their approval.

Rationale:

The lined project tailrace crosses the channel of Snyder Creek, where coho have been observed spawning, on route to discharging in the Cowlitz River. Currently, Snyder Creek passes under the tailrace channel via a culvert. Studies have indicated that this culvert does not meet hydraulic standards for fish passage which means that fish migrating upstream may be delayed, injured or prevented from passing the culvert. Energy Northwest filed its Final License Application (FLA) with the Commission in February 2008 containing the PME measures agreed to in principle, including the measure for Fish Passage at Snyder Creek Tailrace Crossing. The measure details re-routing Snyder Creek into Hall Creek downstream of the tailrace and abandoning the culvert crossing (ENW, 2008).

APPENDIX D

NMFS BIOLOGICAL OPINION REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

Packwood Lake Hydroelectric Project
FERC Project No. 2244

Reasonable and Prudent Measures

NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize or to monitor the incidental take of the LCR Chinook salmon, LCR coho salmon, or LCR steelhead species resulting from the Proposed Action. In order to be exempt from the prohibitions of Section 9 of the ESA, FERC must comply with all of the reasonable and prudent measures and terms and conditions set forth below.

1. Conduct ongoing monitoring and reporting program to confirm the incidental take estimated in this statement, and that the Terms and Conditions of this Incidental Take Statement are effective in avoiding and minimizing incidental take from permitted activities. Conduct required biological monitoring to evaluate post-restoration and enhancement conditions and operational changes.

2. Minimize the likelihood of incidental take from restoration and enhancement measures by applying terms and conditions and the project specifications that avoid or minimize adverse effects to riparian and aquatic habitats during these activities.

3. Minimize the number of mortalities caused by stranding fish from planned and unplanned Project outages.

4. Minimize take from fish handling during monitoring/evaluation studies and fish salvage operations by applying permit conditions that avoid or minimize adverse effects.

5. Continue the measures for maintenance, testing, and operation of the screen to ensure the continued efficacy and minimize risk of water quality impairment and disturbance of listed fish within the tailrace. Conduct monitoring and report the results in an annual report to NMFS (NMFS' section 18 article 1).

6. Ensure continued protection from prior agreed-upon measures during

relicensing discussions (FERC 2009a) for listed salmonids.

7. Ensure that recent reintroduction of fall-run Chinook does not create additional impacts that were not considered in the biological opinion associated with this ITS.

8. Implement the Water Temperature Monitoring and Enhancement Plan as required by the WDOE in the 401 Water Quality Certification.

9. Prepare and provide NMFS with plan(s) and report(s) describing how listed species in the action area would be protected and/or monitored and to document the effects of the action on listed species in the action area.

Terms and Conditions

The terms and conditions described below are non-discretionary, and FERC or any applicant must comply with them in order to implement the reasonable and prudent measures (50 CFR 402.14). FERC or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this incidental take statement (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse. To be exempt from the prohibitions of Section 9 of the ESA, FERC must ensure that Energy Northwest fully carries out the conservation measures in their new license to be issued by FERC.

FERC must include in the license the following terms and conditions that carry out the RPMs listed above. Partial compliance with these terms and conditions may result in more take than anticipated, and invalidate this take exemption. These terms and conditions constitute no more than a minor change to the proposed action because they are consistent with the basic design of the proposed action.

A. **To carry out RPM #1, FERC or its Licensee must undertake the following Term and Condition 1:**

1. Prepare, in consultation with NMFS and consistent with NMFS' terms and conditions and recommendations (NMFS 2008), all design, monitoring and evaluation plans required by FERC or by this opinion to protect ESA-listed Chinook and coho salmon, and

steelhead, and Chinook and steelhead and coho critical habitat.

2. Ensure completion of a comprehensive monitoring and reporting program regarding all actions authorized or completed under the restoration and enhancement measures.

3. Conduct monitoring to determine if tailrace fish screen is effectively excluding fish from Project tailrace and stilling basin without causing delay, injury, or mortality of listed species

4. All Chinook, coho, and steelhead fish handling must be conducted by qualified biologists, and all staff participating in fish and aquatic studies must have the necessary knowledge, skills, and abilities to ensure safe handling of Chinook and coho salmon and steelhead. Carry out each study using Best Management Practices (BMPs) for the collection, handling, and transfer of LCR Chinook and LCR coho salmon, and LCR steelhead, as appropriate.

5. Prepare an annual report that summarizes actions carried out during the previous calendar year. These reports will fulfill the FERC's requirements for notifying NMFS when the amount or extent of incidental take is approached or exceeded (50 CFR §402.14(i)(1)(iv) and (i)(3)).

B. **To carry out RPM #2, FERC or its Licensee must undertake the following Term and Condition 2 as part of Project related construction activities:**

Design criteria related to in-water work timing, sensitive area protection, fish passage, erosion and pollution control, choice of equipment, in-water use of equipment, and work area isolation can avoid or reduce these adverse effects. Those measures will ensure that actions are not completed at sites occupied by adult fish congregating for spawning or where redds are occupied by eggs or pre-emergent alevins, defer construction until the fewest number of fish are present, and otherwise ensure that the adverse environmental consequences of construction are avoided or minimized (NMFS 2008c).

1. Develop and implement a stream restoration and enhancement plan (SREP) for the lowest
1.0 mile (RM 0.0 to 1.0) of Lake Creek in the anadromous zone, including the placement of wood and gravel, after consultation with the natural resource agencies and tribes within 2 years of license

issuance, and monitor effectiveness.

2. Develop and implement a plan to improve fish passage on Snyder Creek where its culvert crosses under the tailrace canal by rerouting Snyder Creek into Hall Creek on the downstream side (south) of the tailrace canal within 2 years of license issuance, and monitor effectiveness.

3. Continue maintenance of culvert until rerouting of Snyder Creek into Hall Creek is complete.

4. Develop SREP and Snyder Creek passage plan and in consultation with NMFS. Include in the SREP and Snyder Creek passage plan all necessary BMPs to minimize detrimental effects to Chinook and coho salmon, steelhead, and Chinook, steelhead, and coho critical habitat from turbidity and sedimentation, interim operations, and handling effects associated with salvage and restoration and enhancement activities.

    a. Inspection of erosion controls. During construction, the operator must monitor instream turbidity and inspect all erosion controls daily during the rainy season (October through May) and weekly during the dry season (June through September), or more often as necessary, to ensure the erosion controls are working adequately.[1]

        i. If monitoring or inspection shows that the erosion controls are ineffective, mobilize work crews immediately to make repairs, install replacements, or install additional controls as necessary.
        ii. Remove sediment from erosion controls once it has reached one-third of the exposed height or capacity of the control.

    b. Construction discharge water. Treat all discharge water

[1] "Working adequately" means that project activities do not increase ambient stream turbidity by more than 10 percent above background 100 feet below the discharge, when measured relative to a control point immediately upstream of the turbidity-causing activity. The Licensee may request that this standard be adjusted by NMFS based on review of the WDEQ 401 Water Quality Certification for construction, and in coordination with WDEQ.

created by construction (e.g., concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) as follows:

i. Water quality. Design, build, and maintain facilities to collect and treat all construction discharge water, including any contaminated water produced by drilling, using the best available technology applicable to site conditions. Provide treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals, and other pollutants likely to be present.
ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities will not exceed 4 feet per second, and the maximum size of any aperture will not exceed one inch.
iii. Spawning areas. Do not release construction discharge water within 300 feet upstream of spawning areas unless it is clean construction discharge water.
iv. Pollutants. Do not allow pollutants, including green concrete, contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours to contact any wetland or the 2-year floodplain, except cement or grout when abandoning a drill boring or installing instrumentation in the boring.

c. During completion of habitat enhancement activities, no pollutants of any kind (sewage, waste spoils, petroleum products, etc.) should come in contact with the water body or wetlands or their substrate below the mean high-high water elevation or 10-year flood elevation, whichever is greater.

d. Treated wood.

i. Construction or habitat enhancement activities will not use treated wood if it may come in contact with flowing water or if it will be placed over water, except for pilings installed following NMFS' guidelines.
ii. Visually inspect treated wood before final placement to detect and replace wood with surface residues and/or bleeding of preservative.
iii. Construction or habitat enhancement activities that require removal of treated wood will use the following precautions:

1. Treated wood debris. Take steps designed to insure that no treated wood debris falls into the water. If treated wood debris does fall into the water, remove it immediately.
2. Disposal of treated wood debris. Dispose of all treated wood debris removed during a project, including treated wood pilings, at an upland facility approved for hazardous materials of this classification or recycle or reuse the treated wood outside of aquatic and riparian habitat. Do not leave treated wood pilings in the water or stacked on the streambank.

e. Preconstruction activity. Complete the following actions before significant alteration of the construction area:

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands, and other sensitive sites beyond the flagged boundary. Construction activity or movement of equipment into existing vegetated areas must not begin until clearing limits are marked.
ii. Minimize areas impacted by construction. Construction impacts will be confined to the minimum area necessary to complete the construction.
iii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are on site:

1. A supply of sediment control materials (e.g., silt fence, straw bales).
2. An oil-absorbing, floating boom whenever surface water is present.
3. Temporary erosion controls. All temporary erosion controls will be in place and appropriately installed downslope of construction activity within the riparian buffer area until site rehabilitation is complete.

f. Temporary access roads.

i. Steep slopes. Do not build temporary roads mid-slope or on slopes steeper than 30 percent.
ii. Minimizing soil disturbance and compaction. Low-impact, tracked drills will be walked to a survey site without the need for an access road. Minimize soil disturbance and compaction for other types of access whenever a new temporary road is necessary within 150 feet of a stream, water body, or wetland by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NMFS.

g. Temporary stream crossings.

i. Do not allow equipment in the flowing water portion of the stream channel where equipment activity could release sediment downstream, except at designated stream crossings unless otherwise approved by NMFS.
ii. Minimize the number of temporary stream crossings.
iii. Design new temporary stream crossings as follows:

1. Survey and map any potential spawning habitat within 300 feet downstream of a proposed crossing.
2. Do not place stream crossings at known or suspected spawning areas or within 300 feet upstream of such areas if spawning areas may be affected.
3. Design the crossing to provide for foreseeable risks (e.g., flooding and associated bedload and debris) to prevent the diversion of stream flow out of the channel and down the road if the crossing fails.
4. Vehicles and machinery will cross riparian buffer areas and streams at right angles to the main channel wherever reasonably possible.

iv. Obliteration. When the project is completed, obliterate all temporary access roads, stabilize the soil, and revegetate the site. Abandon and restore temporary roads in wet or flooded areas by the end of the inwater work period.

h. Vehicles and heavy equipment. Restrict use of heavy equipment as follows:

i. Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (e.g., minimally sized, low ground pressure equipment).

ii. Vehicle and material staging. Store construction materials and fuel, and operate, maintain, and store vehicles as follows:

1. To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on-site.
2. Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage, except for that needed to service boats, in a vehicle staging area placed 150 feet or more from any stream, water body, or wetland, unless otherwise approved in writing by NMFS.
3. Inspect all vehicles operated within 150 feet of any stream, water body, or wetland daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request by NMFS.
4. Before activities begin and as often as necessary during construction activities, steam clean all equipment that will be used below the bankfull elevation until all visible external oil, grease, mud, and other visible contaminants are removed. Any washing of equipment must be conducted in a location that will not contribute untreated wastewater to any flowing stream or area that drains to a stream.
5. Diaper all stationary power equipment (e.g., generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody, or wetland to prevent leaks, unless suitable containment is provided to

prevent potential spills from entering any stream or water body.

6. At the end of each work shift, vehicles must not be stored within or over the waterway.

i. Site preparation. Conserve native materials for site rehabilitation.

i. Minimize alteration or disturbance of the streambanks and existing riparian vegetation to the greatest extent reasonably possible.
ii. Except within the exact footprint of the construction zone, all existing native vegetation within 150 feet of the edge of bank should be retained, to the greatest extent reasonably possible.
iii. If possible, leave native materials where they are found.
iv. If native materials are moved, damaged, or destroyed, replace them with a functional equivalent during site rehabilitation.
v. Stockpile any large wood, native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site rehabilitation.
vi. Mechanical removal of undesired vegetation and root nodes is permitted. Herbicides may be used as part of habitat restoration work, provided no herbicide will be applied within 100 feet of the edge of the bank.

j. Isolation of in-water work area. If adult or juvenile Chinook, coho or steelhead are reasonably certain to be present, or if the work area is less than 300 feet upstream of salmonid spawning habitats, completely isolate the work area from the active flowing stream using inflatable bags, sandbags, sheet pilings, or similar materials, unless otherwise approved in writing by NMFS.

k. Earthwork. Complete earthwork (including drilling, excavation, dredging, filling, and compacting) as quickly as reasonably possible.

i. Excavation. Material removed during excavation will only be placed in locations where it cannot enter sensitive aquatic resources. Whenever topsoil is removed, it must be stored in an upland location and secured to prevent sediment-laden runoff from

reentering streams or wetlands. Topsoil must be reused on site to the greatest extent reasonably possible. If riprap is used for protecting a culvert inlet or outlet, it will be class 350 metric or larger, and topsoil will be placed over the rock and planted with native woody vegetation.

ii. Site stabilization. Stabilize all disturbed areas, including obliteration of temporary roads, following any break in work, unless construction will resume within 4 days.

iii. Source of materials. Obtain boulders, rock, woody materials, and other natural construction materials used for the project outside the riparian buffer area. Spawning gravel for augmentation of spawning habitats must be washed (i.e. cleaned, rinsed rock) river rock, of suitable size for LCR Chinook, LCR coho, and LCR steelhead (as appropriate by location), and if possible, from a source within the local watershed.

l. Boulder placement.

i. Site selection. Boulder placement will be limited to stream reaches with the following features:

1. An intact, well-vegetated riparian area, including trees and shrubs where those species would naturally occur, or that are part of riparian area restoration action.
2. A stream bed that consists predominantly of coarse gravel or larger sediments.

ii. Installation. Boulders will be installed as follows:

1. The cross-sectional area of boulders may not exceed 25 percent of the cross-sectional area of the low flow channel, or be installed to shift the stream flow to a single flow pattern in the middle or to the side of the stream.
2. Boulders will be machine-placed (no end dumping allowed).
3. Permanent anchoring, including rebar or cabling, may not be used.

m. Large wood restoration. Stabilizing or key pieces of large wood

that will be relied on to provide streambank stability or redirect flows must be intact, hard, and undecayed to partly decaying, and should have untrimmed root wads to provide functional refugia habitat for fish. Use of decayed or fragmented wood found lying on the ground or partially sunken in the ground is not acceptable.

n. Spawning gravel restoration.

    i. Gravel placement. Gravel augmentation is limited to areas where the natural supply has been eliminated or significantly reduced through anthropogenic means.
    ii. Gravel source. Gravel to be placed in streams must be obtained from an upland source outside of the channel and riparian area (gravel from any instream source is prohibited) size such that 50 percent of the gradation becomes mobile at the dominant discharge event, rounded and uncrushed (less than 25 percent fractured face), and washed before instream placement.

o. Site restoration. Any large wood, native vegetation, topsoil, and native channel material displaced by construction will be stockpiled for use during site restoration. When construction is finished, all streambanks, soils, and vegetation will be cleaned up and restored as necessary to renew ecosystem processes that form and maintain productive fish habitats. Fencing will be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

p. Stormwater management: Prepare and carry out stormwater management practices for construction of any new or refurbished Project-related facility or habitat enhancement project that will produce a new impervious surface or a land cover conversion that slows the entry of water into the soil.

    i. The goal is to avoid and minimize adverse effects due to the quantity and quality of stormwater runoff for initial construction, and throughout the life of the newly completed facility (e.g., fish ladder, new road, culvert, or habitat enhancement project that requires extensive land clearing) by maintaining or restoring natural runoff conditions. The following criteria and pertinent

elements listed in this section “p” must be met to achieve the following functions:

1. Minimize, disperse and infiltrate stormwater runoff onsite using sheet flow across permeable vegetated areas to the maximum extent reasonably possible without causing flooding, erosion impacts, or long-term adverse effects to groundwater.
2. Pretreat stormwater from pollution generating surfaces, including bridge decks, to the extent reasonably possible, before infiltration or discharge into a freshwater system, as necessary to minimize any nonpoint source pollutant (e.g., debris, sediment, nutrients, petroleum hydrocarbons, metals) likely to be present in the volume of runoff predicted from a 6-month, 24-hour storm.

ii. Runoffs/discharge into a freshwater system. When stormwater runoff will be discharged directly into fresh surface water or a wetland, or indirectly through a conveyance system, the following requirements apply.

1. Maintain natural drainage patterns and, whenever reasonably possible, ensure that discharges from the work site occur at the natural location.
2. Use a conveyance system comprised entirely of manufactured elements (e.g., pipes, ditches, outfall protection) that extends to the ordinary high water line of the receiving water.
3. Stabilize any erodible elements of this conveyance system as necessary to prevent erosion. Do not divert surface water from, or increase discharge to, an existing wetland if that will cause a significant adverse effect to wetland hydrology, soils or vegetation.
4. The velocity of discharge water released from an outfall or diffuser port may not exceed 4 feet per second.
5. Waste anesthetic-laden water must be disposed of in accordance with applicable laws.

q. Construction activities associated with habitat enhancement and erosion control measures must meet or exceed BMPs and other performance standards contained in the applicable state and Federal permits.

r. Construction monitoring and reporting. FERC will ensure that the Licensee submits an annual report to NMFS describing the status of restoration and enhancement activities, and if completed, the success in meeting the RPMs and associated terms and conditions of this incidental take statement. The report will include the following:

i. Construction activities identification.

1. Name of Licensee staff person responsible for construction activities, construction activities names, and detailed description of the activities.
2. Construction activities' location by 5th or 6th field HUC and by latitude and longitude as determined from the appropriate USGS 7-minute quadrangle map.
3. Starting and ending dates for the work completed, or expected completion date for ongoing construction activities.

ii. Photo documentation. Photo documentation of habitat conditions at the construction site before, during, and after completion.

1. Include general views and close-ups showing details of the construction activities and affected site, including pre- and post-construction.
2. Label each photo with date, time, construction activity name, photographer's name, and documentation of the subject activity.

iii. Project data:

1. Work cessation. Dates work ceased because of high flows, if any.
2. Pollution and erosion control. A summary of

pollution and erosion control inspections, including any erosion control failures, contaminant releases, and correction efforts.

3. Description of site preparation.
4. Isolation of inwater work area, capture, and release of Chinook and coho salmon, and steelhead.

    a. Supervisory fish biologist's name and address.
    b. Methods of work area isolation and take minimization.
    c. Stream conditions before, during, and within 1 week after completion of work area isolation.
    d. Means of fish capture.
    e. Number of Chinook and coho salmon, and steelhead captured.
    f. Location and condition of all Chinook and coho salmon, and steelhead released.
    g. Any incidence of observed injury or mortality of Chinook and coho salmon, and steelhead.

5. Stream protection

    a. Type and amount of materials used.
    b. Project size - one bank or two, width, and linear feet.

6. Site rehabilitation. Photo or other documentation that site rehabilitation performance standards were met.

NMFS will be reviewing the detailed construction plans submitted to advise FERC regarding whether or not those plans are likely to meet the BMPs articulated in this incidental take statement's terms and conditions, or such additional BMPs that NMFS deems appropriate.

NMFS will be reviewing the detailed construction plans submitted to

advise FERC regarding whether or not those plans are likely to meet the BMPs articulated in this incidental take statement's terms and conditions, or such additional BMPs that NMFS deems appropriate.

C. **To carry out RPM #3, FERC or its Licensee must undertake the following Term and Condition 3:**

1. Minimize incidental take from annual outage for Project maintenance by beginning outage on August 15 of each operating year, and resuming operation by September 15 or earlier if all necessary work has been completed.

2. Use a temporary weir to restrict spawning Chinook salmon in the Packwood Lake Hydroelectric Project Tailrace slough during the annual outage period (August 15 – September 14). Its goal is to prevent Chinook from spawning in the tailrace slough when future water conditions within the slough may impact and desiccate redds. The temporary weir will serve as a passage barrier to spawning salmon that attempt to enter the tailrace slough from the mainstem Cowlitz River. The tailrace slough is defined as that section of water between the discharge point of Packwood Lake Hydroelectric Project's tailrace, downstream to the point at which that discharge water enters the main stem of the Cowlitz River.

   Energy Northwest will monitor the tailrace slough once a week starting the first week of July of each year to determine whether the Cowlitz River side channel is flowing into the tailrace slough:

   a. If the Cowlitz River side channel is flowing into the tailrace slough then Energy Northwest is not required to install the temporary weir to protect salmon redds because the Cowlitz River side channel backwater flows keep the redds covered in the tailrace slough during the outage period
   b. If the Cowlitz River side channel is not flowing into the tailrace slough then Energy Northwest must construct a temporary weir by July 15th close to the confluence of the tailrace slough and the mainstem Cowlitz River to exclude salmon from spawning in the tailrace slough until tailrace flows are returned to the slough after the outage period or until the tailrace slough discharge no longer provides attractant flows into the mainstem Cowlitz River.

Temporary Weir Design, Installation, Monitoring and Reporting:

a. The temporary weir will be designed and constructed to minimize harm, prevent adult salmon from passing over or around the weir and will be approved by the WDFW and NMFS.
b. Construction and installation of the weir will be permitted by WDFW as per WAC 220-110 Hydraulic code rules which establishes regulations for the construction of hydraulic project(s) or performance of other work that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state, and sets forth procedures for obtaining a hydraulic project approval.
c. The weir will be designed and constructed of quality materials to assure it will provide a non-passable barrier and to remain in the water for approximately 3-6 weeks each year.
d. The weir will be installed as near as practicable to the confluence of the tailrace slough and the mainstem Cowlitz River, in an area with the lowest channel flow and least water depth. The lower the depth of water at the weir site the less likely fish would have an opportunity bypass the weir.
e. The weir will also extend a minimum of two feet (2') on either side of the wetted channel at the point of installation.
f. The weir will be installed no later than July 15th and must be monitored a minimum of once per week. Additionally, any upstream water in the tailrace slough will be monitored at the same time for any salmon redds to determine the effectiveness of the weir. Weekly monitoring results will be documented in the tailrace fish barrier logs.
g. The weir will be removed by September 15 or when the tailrace slough discharge no longer provides attractant flows into the mainstem Cowlitz River.
h. The weir must be transported back to the Project and stored for future use.
i. Energy Northwest must provide NMFS and all stakeholders an annual report of findings 30 days after the weir is removed or when it is determined by the above criteria that no weir installation is required for that year.

3. Inspect the tailrace slough prior to the annual outage, and immediately after an unplanned outage for adequate flows, and conduct fish rescue,

if necessary, as well as record observed mortalities and dewatering of redds, when outages are anticipated to be greater than 24 hours.

4. Inspect the tailrace slough immediately after planned and unplanned outages for redds. If adequate flows are not present, provide supplemental flows to the tailrace slough, if necessary, until project flows are returned, when technically feasible.

D. **To carry out RPM #4, FERC or its Licensee must implement Term and Condition 4 to ensure that any listed salmonids trapped or captured during restoration, maintenance, monitoring, or salvage operations are protected by undertaking the following:**

1. Conduct fish rescue within 12 hours of planned or unplanned outages in the tailrace slough if the slough is dependent on Project flows.

2. Take all appropriate steps to minimize the amount and duration of handling during Chinook and coho salmon, and steelhead capture and release operations. The operations must maintain captured fish in water to the maximum extent possible during seining/netting, handling, and transfer for release to prevent and minimize stress.

    a. Intermittently during isolation of an in-water work area, fish trapped in the area must be captured using a trap, seine, electrofishing, or other methods as are prudent to minimize risk of injury, then released at a safe release site. The fish biologists for Energy Northwest or WDFW, or their subordinate staff, must conduct all fish salvage operations, unless otherwise approved in writing by NMFS.
    b. Electrofishing- If electrofishing will be used to capture fish for salvage, NMFS' electrofishing guidelines will be followed (NMFS 2000). Those guidelines are available from the NMFS West Coast Region, Protected Resources Division, Portland, Oregon.

        i. Do no electrofish near listed adult salmonids in spawning condition or near redds containing eggs.
        ii. Keep equipment in good working condition. Complete manufacturer's preseason checks, follow all provisions, and record major maintenance work in a log.

iii. Train the crew by a crew leader with at least 100 hours of electrofishing experience in the field using similar equipment. Document the crew leader's experience in a logbook. Complete training in waters that do not contain listed fish before an inexperienced crew begins any electrofishing.

iv. Measure conductivity and set voltage as follows:

Conductivity (µS/cm)	Voltage
Less than 100	900 to 1100
100 to 300	500 to 800
Greater than 300	150 to 400

vi. Use direct current (DC) at all times.

vii. Begin each session with pulse width and rate set to the minimum needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured. Start with a pulse width of 500 µs and do not exceed 5 milliseconds. Pulse rate should start at 30 Hz and work carefully upward. In general, pulse rate should not exceed 40 Hz, to avoid unnecessary injury to the fish.

viii. The zone of potential fish injury is 0.5 meters from the anode. Care should be taken in shallow waters, undercut banks, or where fish can be concentrated, because in such areas the fish are more likely to come into close contact with the anode.

ix. Work the monitoring area systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period.

x. Have crew members carefully observe the condition of the sampled fish. Dark bands on the body and longer recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit may need adjusting. End sampling if injuries occur or abnormally long recovery times persist.

xi. Whenever possible, place a block net below the area

being sampled to capture stunned fish that may drift downstream.

xii. Record the electrofishing settings in a logbook along with conductivity, temperature, and other variables affecting efficiency. These notes, with observations on fish condition, will improve technique and form the basis for training new operators.

c. Do not use seining or electrofishing if water temperatures exceed 18°C, or are expected to rise above 18°C, unless no other method of capture is available.
d. ESA-listed fish must be handled with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.
e. Water quality conditions must be adequate in tanks, buckets, or in sanctuary nets that hold water to transport fish by providing circulation of clean, cold water, using aerators to provide DO, and minimizing holding times.
f. Fish must be released into a safe release site as quickly as possible, and as near as possible to capture sites. In general, any fish removed from the work area must be released back into the Cowlitz River immediately downstream of the work area, unless otherwise directed by NMFS or WDFW.
g. ESA-listed fish must not be transferred to anyone except the fish biologists for the Energy Northwest or WDFW, or their designated subordinate staff, unless otherwise approved in writing by NMFS.
h. All other Federal, state, and local permits necessary must be obtained to conduct the capture and release activity.
i. NMFS or its designated representative must be allowed to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.
j. An electronic copy of the Salvage Report Form must be submitted to NMFS within 10 calendar days of completion of the salvage operations, noting the quantities and species of fish salvaged, and mortalities observed.

3. Require a special seining operation be conducted when the Cowlitz River exceeds elevation of 1044 feet MSL, meeting or exceeding the height of the fish exclusion racks on the barrier (l044 feet MSL) or

water is observed flowing into the tailrace canal upstream of the barrier, a seining operation will be conducted in the Project stilling basin as soon as waters recede to a level where fish salvage can be safely conducted.

E. **To carry out RPM #5, FERC or its Licensee must undertake the following Term and Condition 5:**

1. Complete tailrace and stilling basin sampling as described in (Energy Northwest 2009, FERC 2009a).

2. Maintain and monitor effectiveness of the tailrace fish barrier as required by NMFS (2007), and detailed in Tailrace Fish Barrier Facility Maintenance Plan (Energy Northwest 2009).

    a. Ensure the Tailrace Fish Barrier Facility is monitored for fish or other wildlife mortalities and that the information is archived so it may be provided to FERC and NMFS in annual reports.
    b. Notify NMFS of damage or other factors that may interrupt screen operations.
    c. Respond to NMFS or WDFW requests for screen repair or maintenance within 48 hours.
    d. Facilitate access to the fish barrier upon request by NMFS or WDFW.
    e. Fish Screens: Have the fish screen operated and maintained according to the NMFS' fish screen criteria (NMFS 2011b).
    f. Implement the station stormwater management plan if excessive runoff is observed entering the Cowlitz or tailrace adjacent to the fish barrier. Straw bales or silt fence will be deployed to filter sediment.
    g. Prepare an annual monitoring report to summarize the results of biological monitoring and evaluations and summarize the upcoming year's activities, including all biological monitoring and evaluations. This report must be submitted to NMFS for review and comment by January of each year.

F. **To carry out RPM #6, FERC or its Licensee must undertake the following Term and Condition 6:**

1. Provide increased instream flows in Lake Creek in accordance with the schedule below.

Proposed minimum instream flows (cfs) for Lake Creek, as measured at the drop structure. (Source: Energy Northwest 2008).

Month	Instream Flow
January	4
February	4
March	4
April	7
May	15
June	10
July	15
August 1–15	15
August 16–September	20
September 16–30	15
October	10
November	7
December	4

2. Implement the Lake Creek Ramping Rate Plan for Reach 5 below the drop structure (Energy Northwest 2009). With this plan, Energy Northwest would limit all instream flow reductions associated with the minimum instream flows to a maximum of 2.5 cfs per hour. One exception to this procedure is the June 1 reduction in flow (from 15 cfs to 10 cfs), which would be completed in one hour during night-time hours.

Interim ramping rate guidelines for water diversions in Washington state [2] (Source: Hunter 1992).

Season	Daylight Rates	Night rates
Feb 16–June 15 (salmon fry)	No ramping	2 inches/hour
June 16–Oct 31 (steelhead and trout	1 inch/hour	1 inch/hour
Nov 1–Feb 15	2 inches/hour	2 inches/hour

[2] Washington Department of Fish and Wildlife did not make a specific recommendation for ramping rates at the Packwood Project.

3. Provide a spill event of greater than or equal to 285 cfs for as long as lake inflows can sustain that flow for a target of 24 hours, every other water year or 3 out of 6 water years. Provide documentation and reporting of the spill events and, if the frequencies of the spill events cannot be achieved, the agencies (including NMFS, Forest Service, and WDFW) will be consulted for an alternate plan.

4. Provide gravel and wood recruitment stations in Reach 5 below the drop structure. Wood and gravel located at these structures would be carried downstream during the channel- forming flows provided as part of the aquatic habitat spill events described above.

5. Install flow measurement equipment at the Lake Creek Road Bridge and begin recording data within the first year of the issuance of any new license.

6. Develop and implement a threatened, endangered, and sensitive species management plan.

7. Develop and implement a resource coordination plan to coordinate the recommended management plans and associated requirements for the project with various agencies and include provisions for an annual coordination meeting.

G. **To carry out RPM #7, FERC or its Licensee must undertake the following Term and Condition 7:**

Considering that fall-run Chinook were recently introduced in the upper Cowlitz in 2010, it is important to assess that considerations for other species are consistent with fall-run Chinook.

1. Within a year after license issuance, the Licensee must develop a fall-run Chinook monitoring plan in consultation with NMFS to provide baseline information on fall-run Chinook population density in areas associated with, and potentially affected by, the Packwood Lake Hydroelectric Project. NMFS must approve the final plan. These investigations are intended to fill in data gaps related to distribution, life history strategies, and density of fall-run Chinook presence in the Project area.

H. **To carry out RPM #8, FERC or its Licensee must undertake the following Term and Condition 8:**

1. Implement the Tailrace Water Temperature Monitoring and Enhancement Plan filed with the Commission on June 6, 2008. The Tailrace Water Temperature Monitoring and Enhancement Plan calls for Energy Northwest to monitor water temperatures in the Project's lined tailrace, at the Packwood Lake outlet, the Cowlitz River, and the mouth of Lake Creek to determine the effect of the tailrace water on the Cowlitz River water temperature. Conduct the monitoring during the first 10 years following license issuance, unless the temperature criteria is met for 3 consecutive years, at which time Energy Northwest would consult with WDOE to suspend or modify the monitoring activities upon Commission approval. One exception for the previously stated monitoring would be to conduct monitoring associated with the project outage between August 15 and September 14 annually for the duration of the new license. If the tailrace temperature under the proposed operating regime does not meet applicable standards, Energy Northwest would consult with the WDOE, NMFS, and other agencies on additional ways to address this issue.

2. Ensure Project modification and operations comply with the water quality DO criterion, and maintain an IGDO minimum of 8mg/L for the duration of the spawning, incubation and fry emergence periods, unless this concentration is unattainable due to atmospheric and temperature conditions.

I. **To carry out RPM #9, FERC or its Licensee must undertake the following Term and Condition 9:**

1. Within one year of the issuance of the new license, prepare, in consultation with NMFS, and overall approach to development of plan(s) and report(s) describing how listed species in the action area would be protected and/or monitored and to document the effects of the action on listed species in the action area annual. NMFS must approve the approach.