

## EXECUTIVE SUMMARY

On October 29, 2003, Public Utility District No. 2 of Grant County, Washington (Grant PUD) filed with the Federal Energy Regulatory Commission (Commission) an application for a new license for the 1,768.8-megawatt (MW) Priest Rapids Hydroelectric Project No. 2114-116 (Project), located in portions of Grant, Yakima, Kittitas, Douglas, Benton, and Chelan Counties, Washington. This final environmental impact statement (final EIS) evaluates the potential effects on the environment associated with relicensing the Project. The project is an integral part of the seven-dam mid-Columbia River Hydroelectric System, which is the single largest coordinated hydroelectric system in the country. The area referred to as the mid-Columbia River extends from Grand Coulee dam, which at 6,809 MW is the largest hydro generating facility in the United States, to the Hanford Reach, nearly 210 miles downstream. The Project is operated in coordination with other mid-Columbia hydroelectric projects that utilize project storage to reshape the inflow hydrograph to help meet hourly changes in electricity demands. The current project license expired on October 31, 2005 and the Project is currently operating on an annual license per a Notice of Authorization issued on November 2, 2005.

The project occupies an estimated total 3,103.6 acres of federal land managed by the Bureau of Reclamation, Bureau of Land Management, U.S. Department of the Army, U.S. Fish and Wildlife Service, U.S. Department of Energy, and Bonneville Power Administration. The project also occupies an estimated total 2,804 acres of Washington State land.

In this final EIS we, the Commission staff, assess the effects of operating the project: (1) with no changes or enhancements to the current facilities or operations (No-action Alternative); (2) as proposed by Grant PUD (Proposed Action); and (3) as proposed by Grant PUD with additional or modified environmental measures to further protect and enhance environmental resources (Staff Alternative). Specifically, this final EIS evaluates the potential environmental effects and developmental costs associated with relicensing the Project.

### **No-action Alternative**

On July 23, 2004, the Commission issued an order, 108 FERC ¶ 62,075 (2004), amending Grant PUD's license and authorizing the replacement of the 10 turbines at the Wanapum development with 10 new, upgraded turbines over a period of about 8 years. The order authorized the replacement of one turbine, followed by a study to test the effect of the advanced turbine design on fish passage survival. On October 11, 2005, Grant PUD filed a report on fish survival through the first installed turbine and, subsequently, on December 14, 2005, the Commission issued an order, 113 FERC ¶ 62,205 (2005), authorizing the installation of the remaining nine turbines. Upon completion of the

replacement of all 10 turbines, the total capacity at the Wanapum development would increase from 900 MW to 1,038 MW.

Under the No-action Alternative, the project would continue to operate under the terms and conditions of the existing license, including the installation of all 10 turbines at the Wanapum dam, and no new environmental measures would be implemented. We use this alternative as the baseline against which we evaluate other alternatives. Under the No-action Alternative, the project (Priest Rapids and Wanapum developments) has a total authorized capacity of 1,893 MW, a dependable capacity of 1,647 MW and would annually generate an average of 9,039,634 megawatt-hours (MWh) of electricity. Based on our estimate of the current cost of replacing this amount of power with no consideration of inflation over the 30-year period of our analysis, the Project has an average annual power value of \$346,876,000 (\$38.4/MWh). The average annual cost of producing this power is \$78,380,000 (\$8.7/MWh), resulting in an annual net benefit of \$268,495,000 (\$29.7/MWh).

## **Proposed Action**

Under the Proposed Action, Grant PUD would implement the environmental measures detailed in its final license application and in subsequent filings. Measures proposed by Grant PUD include the following:

### ***Geology and Soils Resources***

- Continue to monitor the project impoundment rims for instability and erosion.
- Develop and implement erosion and sediment control measures related to project land-disturbing activities.

### ***Water Quantity and Quality***

- Implement a Water Quality Monitoring Plan (401 Application) that includes: continued reservoir management, maintenance, and monitoring of spill patterns to minimize ambient total dissolved gas levels; a water temperature monitoring plan; a dissolved oxygen, turbidity, and pH monitoring plan; operating according to the Hanford Reach Agreement; a plan for managing nuisance aquatic macrophyte and zebra mussels (see also Terrestrial Resources section); addressing potential short-term water quality impacts; and developing details for calibrating water quality monitoring sites.
- Coordinate the spill program for the project with the spill activities of other projects through the Priest Rapids Coordinating Committee (see also Aquatic Resources section).
- Continue to operate each taintor gate at Wanapum dam (see also Aquatic Resources

section).

- Continue to identify and implement experimental spill regimes as may be warranted to test opportunities for improving fish survivals with less spill flow and/or reducing TDG levels at either Priest Rapids or Wanapum Dams (see also Aquatic Resources section).
- Provide biological monitoring to determine the incidence of gas bubble disease symptoms in downstream migrating juvenile salmonids.
- Provide tailrace pumping to replace gravity fishway attraction water supply.

### *Aquatic Resources*

- Implement and assess anadromous fish measures using an adaptive management process, various technical committees, and a dispute resolution process.
- Make steady progress towards achieving a minimum 91 percent combined adult and juvenile salmonid survival performance standard.
- Develop and annually revise a downstream passage alternatives action plan to contribute to achievement of the applicable performance standards at Wanapum and Priest Rapids dams.
- Develop and implement a performance evaluation program to assess the hatchery program, habitat program, and improvements to juvenile and adult passage survival.
- Produce annual progress and implementation plans to describe the implementation activities for spring-run Chinook salmon and steelhead.
- Contribute to a No Net Impact fund for annual juvenile salmonid survival.
- Evaluate modifications to the spill regime and spill pattern at each dam to improve juvenile salmonid survival.
- Continue to operate and maintain two adult fishways at each dam and investigate methods for improving hydraulic conditions in the fishway collection channels, junction pools, and entrance pools.
- Use the spill and bypass programs for juvenile downstream passage to provide fallback passage routes for adult spring and summer Chinook salmon. Operate the sluiceways at both Priest Rapids and Wanapum dams to provide fallback routes for steelhead and fall Chinook salmon.
- Construct, operate, and maintain an off-ladder adult trapping facility in the left-bank fishway at Priest Rapids dam.
- Operate and maintain PIT-tag detection equipment at the Priest Rapids fishways.
- Fund fish counting at Priest Rapids and Wanapum dams and provide daily fish counts for both facilities. Develop video monitoring capability for counting adults in fishways at both dams.

- Modify diffusion chambers on both fishways at Priest Rapids to improve adult lamprey passage. Modify the design of the fish count stations at Priest Rapids and Wanapum dams to improve adult lamprey passage and enumeration. If appropriate, reduce fishway flows at night to improve adult lamprey passage.
- Continue to study possible ways to improve downstream juvenile salmonid survival at Priest Rapids dam.
- Continue to provide spill (61 percent of river flow in spring and 39 percent in summer) for downstream passage at Priest Rapids dam until a better downstream passage alternative is designed, tested, and implemented.
- Continue to provide spill (43 percent river of flow in spring and up to total dissolved gas limits in summer) for downstream passage at Wanapum dam until a better downstream passage alternative is designed, tested, and implemented.
- Develop and implement operating criteria to improve turbine passage survival at Priest Rapids dam and, in the future, install new Advanced Design Turbines.
- Install gatewell exclusion screens to prevent smolts from entering the emergency wheelgate or bulkhead slots at the Priest Rapids and Wanapum dams.
- Construct a downstream fish bypass at Wanapum dam consisting of an ogee-crested weir through the center of Unit 11 and a submerged tailrace chute.
- If the proposed downstream bypass for Wanapum dam fails to achieve 95 percent dam passage survival, consult with the joint fisheries parties to improve survival through additional operational or structural modifications.
- Fund a northern pikeminnow removal program to improve smolt passage survival through the reservoirs and tailraces of Priest Rapids and Wanapum dams.
- Fund and implement an avian hazing and control program to improve smolt passage survival through the tailraces of Priest Rapids and Wanapum dams.
- Use radiotelemetry or other techniques to evaluate upstream and downstream route-specific survival at Priest Rapids and Wanapum dams.
- Conduct survival studies using PIT-tag technology or other suitable study methods to obtain dam and project passage survival estimates.
- Develop and implement a Hatchery and Genetic Management Plan for spring, summer, and fall Chinook salmon, steelhead, and sockeye salmon.
- Fund and develop the hatchery facilities necessary to annually produce 600,000 yearling spring Chinook salmon, 833,000 yearling summer Chinook salmon, 1,143,000 sockeye salmon smolts, and 100,000 steelhead smolts. Upgrade and renovate the Priest Rapids Hatchery and continue to annually produce 6,000,000 fall Chinook salmon smolts and 1,000,000 fall Chinook salmon fry. Consult on options to develop equivalent alternative mitigation programs if annual production of 1,143,000 sockeye salmon smolts is unattainable.

- Annually provide \$1,096,552 to the Priest Rapids Project Habitat Fund. Develop a habitat plan to identify goals, objectives, a process for coordination, and a process by which habitat projects would be identified and implemented.
- Investigate the feasibility of habitat modifications in the Wanapum dam tailrace.
- Implement operating agreements with the Bonneville Power Administration, Douglas County PUD, and Chelan County PUD to address the cumulative effects of operations at the seven main stem dams (Priest Rapids to Grand Coulee) that control flows and result in flow fluctuations in the Hanford Reach.
- Provide a minimum flow of 55 to 70 thousand cubic feet per second in the Hanford Reach during the fall Chinook salmon spawning period.
- Establish a Critical Flow for protection of fall Chinook salmon during the pre-hatch, post-hatch, and emergence periods.
- Limit fluctuations in outflow from Priest Rapids dam during the fall Chinook rearing period within the Hanford Reach.
- Maintain a minimum flow of 36 kcfs in the Hanford Reach during all times outside the fall Chinook salmon spawning, pre-hatch, post-hatch, and emergence periods.
- Continue to use Standard Operating Procedures at both dams.
- Construct a white sturgeon conservation facility at the Priest Rapids Hatchery.
- Provide funding for upgrades, improvements, and operating costs at the Columbia Basin Hatchery.
- Enhance and improve fish habitat in the lower five miles of Crab Creek.

### ***Terrestrial Resources***

- Develop and implement a Wildlife Habitat Management Plan that would enhance riparian/wetland habitat within the lower five miles of Crab Creek and the Priest Rapids Wildlife Area and enhance wildlife habitats at the Colockum, Whiskey Dick, and Quilomine wildlife areas.
- Develop a transmission line avian collision protection plan.
- Continue current programs of installation and maintenance of: 48 wood duck nest boxes around the project shoreline, 12 raptor nesting, roosting, and perching structures, and 50 waterfowl nesting platforms.
- Support a fire suppression program in the Colockum, Quilomene, Whiskey Dick, Priest Rapids, Crab Creek, and Buckshot Wildlife Management Areas.

### ***Rare, Threatened and Endangered Species***

- Fund a rare, threatened and endangered botanical species protection plan that includes: operations and maintenance expenses, a construction schedule of any future

projects to avoid disturbance of rare species, conducting pre-construction surveys, identifying measures to protect any species found during the surveys, developing an implementation schedule for protective measures, and developing a monitoring plan to evaluate the effects on rare species and habitat.

- Develop a long-term plan to monitor rare, threatened and endangered plants within the project area that includes: a description of the methods to be employed, mapping and quantifying population trends, an implementation schedule, schedule for reporting and consulting with appropriate agencies regarding the monitoring results, and funding and managing of research information.
- Develop a bald eagle perching and roosting tree enhancement and protection program.
- Develop a northern wormwood conservation plan that would include: continuing annual demographic monitoring for 10 years, working with Bureau of Reclamation to maintain 5,000 feet of fencing to eliminate vehicular access, and funding of ongoing noxious weed control, access control, data management, taxonomic investigations, and research.

### ***Cultural Resources***

- Continue its commitments to the Wanapum reflected in the agreement entered on January 8, 1957, and subsequently modified, and through any future modifications agreed to by the parties.
- Develop a multiple property documentation format for National Register of Historic Places evaluation.
- Implement a proposed schedule for determining National Register eligibility and assess/address adverse effects on remaining cultural resource properties so far inventoried.
- Within one year of license issuance and in consultation with the established the Cultural Resource Working Group, finalize and implement a Historic Properties Management Plan.

### ***Recreation and Land Use***

- Finalize the draft Recreation Resource Management Plan that defines the management of existing and future recreation resources associated with the project, including operation and maintenance costs; recreation monitoring; interpretation and education (includes interpretive displays/kiosk); integration of recreation resources with other resource management plans; and review.
- Provide funding for one full-time law enforcement (FTE) officer to Washington Department of Fish and Wildlife and one FTE to be equally divided between Grant County and Kittitas County Sheriff's Offices; continue to provide a boat at Wanapum

dam for use by local law enforcement officers.

- Concentrate new recreation development in suitable areas that is compatible with the draft Shoreline Management Plan.
- Develop and implement a final Shoreline Management Plan and manage lands accordingly; protect the scenic quality of the mid-Columbia River and its surrounding.

Grant PUD proposes to replace the 10 existing turbines at the Priest Rapids development with advanced design turbines beginning in 2017 and extending through 2023, assuming the existing turbines have reached the end of their useful life. Upon completion of the replacement of all 10 turbines, the total capacity at the Priest Rapids development would increase from 855 MW to 955.6 MW, the rated capacity of the existing generators. Upon completion of the proposed turbine replacement upgrades at both developments, the total Project capacity would increase from 1,768.8 MW to 1,994 MW, an increase of 225 MW over the current installed capacity. With a total capacity of 1,994 MW, a dependable capacity of 1,742 MW and an average annual generation of 9,753,677 MWh, the Project, with all of Grant PUD's proposed measures, would have an average annual power value of \$377,346,000 (\$38.69/MWh), an annual production cost (levelized over the 30-year period of our analysis) of \$146,722,690 (\$15.04/MWh), and an annual net benefit of \$230,623,310 (\$23.75/MWh).

### **Staff Alternative**

After evaluating Grant PUD's proposed action, and the recommendations from the resource agencies and other interested parties, we considered what, if any, additional measures would be necessary or appropriate with continued operation of the project. The Staff Alternative generally consists of the Proposed Action with additional or modified environmental measures, which include some of the agency recommendations made pursuant to sections 18, 10(a), and 10(j) of the Federal Power Act, or modifications thereof, as noted.

The Staff Alternative for the Project includes most of the environmental measures proposed by Grant PUD above, except for five measures that Staff is *not* recommending:

- Contribute to a No Net Impact fund for annual juvenile salmonid survival.
- Installation of gatewell exclusion screens to prevent smolts from entering the emergency wheelgate or bulkhead slots in Priest Rapids and Wanapum dams.
- Provide funding for upgrades, improvements, and operating costs at the Columbia Basin Hatchery.
- Enhance and improve fish habitat in the lower five miles of Crab Creek.
- Provide funding for law enforcement officers.

Staff also recommends the following additional and/or modifications to environmental measures:

### *Aquatic Resources*

- Develop a detailed fishery operations plan.
- Investigate the gate seals at Wanapum dam as a source of juvenile salmonid mortality.
- Study the effects of gatewell exclusion screens on juvenile salmonid and lamprey passage.
- Develop and implement a bull trout monitoring plan to document occurrences of bull trout in the project area.
- Add components to the Pacific Lamprey Management Plan.
- Develop and implement a White Sturgeon Management Plan.
- Prepare a final White Sturgeon Conservation Aquaculture Plan.
- Establish a Priest Rapids Fishery Forum
- Develop a Crab Creek/Burkett Lake Enhancement Plan

### *Terrestrial Resources*

- Develop a Wildlife Habitat Management Plan (Wildlife Plan) that fully describes the actions that would be implemented in the first five years of any license and includes provisions for updating the plan every five years thereafter. The plan should identify the projects that would be implemented, where they would be implemented, how they would be implemented, how they would be maintained and monitored to ensure their continued success, and a schedule for their implementation--habitat improvement projects should identify and give priority to projects that address shrub steppe, riparian, and wetland habitats within and immediately adjacent to the project and should consider access controls.
- Develop and implement a Wildlife Habitat Monitoring and Information & Education Program to monitor the indirect effects of project-related recreation on wildlife and sensitive wildlife habitats. The wildlife monitoring and information and education program, coordinated with the Shoreline Management Plan and the Recreation Plan, should describe the methods that would be employed to educate the recreating public about the potential adverse effects of dispersed recreation on sensitive habitats and a detailed methodology for assessing recreation impacts on wildlife habitats and identifies potential corrective actions.
- Implement an Aquatic Invasive Species (AIS) Plan (same as nuisance aquatic plan proposed by Grant PUD) with three additional components: provisions for identifying and recommending any additional measures for detecting future AIS infestations; a detailed information and education program that includes: identifying

boat access points and distributing education material during peak boating season (May 1-October 30 each year), conducting voluntary boat inspection demonstrations to explain the AIS program and proper methods of cleaning boats, and distributing voluntary boater surveys prepared by Washington Department of Fish and Wildlife; and an implementation schedule.

### ***Cultural Resources***

- File with the Commission a Memorandum of Agreement between Grant PUD and the Wanapum, which may include any relevant portions of past agreements, to protect cultural resources of significance to the Wanapum.
- Provide the Department of Archaeology and Historic Preservation with the missing and incomplete information associated with the submitted site record and determination of eligibility forms.
- Develop and implement protection/mitigation measures for 20 archeological sites.
- Determine National Register eligibility for all remaining inventoried archeological sites and other cultural resources located within the Project's area of potential effect.
- Identify site-specific project-related effects on all National Register-eligible cultural resources and implement measures to protect such sites.
- Reconvene a committee similar to the Hanford Reach National Monument Federal Planning Advisory Committee to address shoreline-related effects on archeological sites in the Hanford Reach.

### ***Recreation and Land Use***

- Conduct recreational use monitoring on project lands every 6 years rather than every 12 years as proposed by Grant PUD.
- Provide additional signage at identified recreation sites.
- In a final Recreation Plan, include a provision (*e.g.*, signs) at Quilomene Dune and Bay to address wake size by boaters.
- Dredge and lengthen the Kittitas County boat launch at Vantage.
- In a final Shoreline Management Plan, manage Crescent Bar Island under the land classifications proposed as planned development and conservation, but no further development should occur beyond the existing disturbed footprint; delineate a shoreline buffer zone on the island.

The staff alternative includes the same developmental upgrades as Grant PUD's proposal and, therefore, would have the same capacity and energy attributes. Based on a total capacity of 1,994 MW, a dependable capacity of 1,742 MW and an average annual generation of 9,753,677 MWh, the Project would have an annual power value of

\$377,346,000 (\$38.69/MWh). Since the staff alternative includes costs of additional measures, the annual production cost (levelized over the 30-year period of our analysis) is about \$145,669,980 (\$14.93/MWh), yielding an annual net benefit of about \$231,676,020 (\$23.75/MWh).

Section 4(e) of the Federal Power Act gives the Secretaries of the Interior and Agriculture authority to impose conditions on a license issued by the Commission for hydropower projects located on “reservations” under the respective Secretary’s supervision. See 16 U.S.C. §§ 796(2), 797(e). By letter dated May 26, 2005, Interior on behalf of Bureau of Reclamation submitted the preliminary terms and conditions pursuant to section 4(e). For a summary of these preliminary conditions, see section 2.3.1. By letter dated March 24, 2006, Interior withdrew the preliminary section 4(e) terms and conditions and instead, submitted them pursuant to section 10(a).

Section 18 of the Federal Power Act, 16 USC § 811, states that the Commission shall require a licensee to construct, maintain, and operate fishways such as the ones the Secretaries of the U.S. Department of Commerce and Interior may prescribe. In a letter filed on May 27, 2005, National Marine Fisheries Service provided preliminary fishway prescriptions for salmon and steelhead at the Project. In a letter filed on May 26, 2005, Interior filed preliminary fishway prescriptions for salmon, steelhead, bull trout, and Pacific lamprey at the Project. For a summary of these prescriptions, see section 2.3.1.

The Staff Alternative does not include several of the section 10(a) conditions, section 18 prescriptions<sup>6</sup>, as well as some recommendations filed by Interior, National Marine Fisheries Service, and Washington Department of Fish and Wildlife, pursuant to section 10(j) of the Federal Power Act. We did not recommend measures that we find are not justified or would not provide benefits over the staff-recommended measures. We address all recommendations throughout this final EIS and specifically in section 5.0, *Staff’s Conclusions*.

## **Conclusion**

We chose the Staff Alternative as the preferred alternative because: (1) the Project would provide a significant (1,994 MW) and dependable source of electrical energy for the region; (2) the Project would avoid the need for an equivalent amount of fossil-fuel-fired, electric generation and capacity, thereby continuing to help conserve these nonrenewable energy resources and reduce atmospheric pollution; and (3) the protection,

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<sup>6</sup> Section 18 subjects licensed projects to mandatory prescriptions for fishways imposed by the Secretary of the Interior (via Fish and Wildlife Service) and/or of Commerce (via National Marine Fisheries Service).

mitigation, and enhancement measures proposed by Grant PUD, combined with the additional measures recommended by the staff, would adequately protect and enhance environmental resources and mitigate impacts of the Project.

The overall benefits of this alternative would be worth the cost of proposed environmental measures and would outweigh the consequences of the other alternatives or license denial.