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, located in portions of Grant, Yakima, Kittitas, Douglas, Benton, and Chelan Counties, Washington. This draft environmental impact statement (DEIS) evaluates the potential effects on the environment associated with relicensing the Priest Rapids 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 Priest Rapids 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.

The project occupies an estimated total 3,103.6 acres of federal land managed by the Bureau of Reclamation (BOR), Bureau of Land Management (BLM), 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 DEIS 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 DEIS evaluates the potential environmental effects and developmental costs associated with relicensing the Priest Rapids 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, 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 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 indications of instability and erosion.
- Develop and implement erosion and sediment control measures related to project land-disturbing activities.

Water Quantity and Quality

- Continue its reservoir management and maintenance operations, and adjust downstream fish passage spill flows to minimize ambient total dissolved gas (TDG) levels.
- Implement a water temperature monitoring plan for waters potentially affected by the project.
- Continue to monitor dissolved oxygen (DO), turbidity, and pH at four fixed site monitoring stations and the Rock Island tailrace.
- Manage flow releases to protect fish habitat downstream of the Priest Rapids Dam in accordance with the Hanford Reach Fall Chinook Protection Program Agreement
- Develop a plan for managing nuisance aquatic plants at key recreation sites within the project area and monitoring project waters for indicators of nuisance levels of aquatic plant growth.

- Continue monitoring project waters for the possible introduction of the non-native Zebra mussel, a nuisance mollusk species.
- Consult with agencies and implement standardized water quality protection measures prior to undertaking any planned construction, maintenance and emergency response actions.
- Continue funding the instrument calibration and water quality data collection program known as the fixed site quality assurance protection plan.
- When hydrologic conditions permit, manage spill levels at Priest Rapids and Wanapum dams to maintain total dissolved gas (TDG) levels below 120 percent.
- Monitor TDG and water temperature through the use of fixed-site monitors located in the forebays and downstream of both Priest Rapids and Wanapum dams.

Aquatic Resources

- Implement and assess anadromous fish measures using an adaptive management process that would include establishment of a Priest Rapids Coordinating Committee, various technical committees, and a dispute resolution process.
- Continue to operate and maintain two adult fishways at each dam according to Fishway Operating Plans and seek solutions and cost-effective corrective actions if monitoring and evaluation identifies adult fish passage problems.
- 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.
- Operate and maintain adult trapping facilities 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.
- 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.
- Modify spillbay 22 of Priest Rapids dam to create a downstream fish bypass consisting of two smaller, full-depth spillways. If the initial modifications to spillbay 22 are successful in improving downstream passage survival, construct new training

walls and apron slabs in the tailrace downstream of spillbays 21 and 22 to improve tailrace egress conditions for smolts using the bypass.

- If the proposed downstream bypass for Priest Rapids dam fails to achieve 95 percent dam passage survival, consult with the joint fisheries parties to improve survival through additional operational or structural modifications.
- After consultation with the Priest Rapids Coordinating Committee, provide spill for downstream passage at Priest Rapids dam until the proposed downstream bypass is operational. Spill may also be used to provide downstream fish passage if the survival objectives can not be met by the proposed downstream bypass.
- To improve turbine passage survival at Priest Rapids dam, develop and implement operating criteria to avoid settings that have been shown to result in poor survival and, in the future, install new Advanced Design Turbines.
- To prevent smolts from entering the emergency wheelgate or bulhead slots in Priest Rapids dam, install gatewell exclusion screens.
- 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.
- After consultation with the Priest Rapids Coordinating Committee, provide spill for downstream passage at Wanapum dam until the proposed downstream bypass is operational.
- To improve turbine passage survival at Wanapum dam, implement operating criteria to avoid settings that have been shown to result in poor survival and install new Advanced Design Turbines.
- To prevent smolts from entering the emergency wheelgate or bulhead slots in Wanapum dam, install gatewell exclusion screens.
- Fund a northern pike minnow 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 to obtain dam and project passage survival estimates.

- To help recover natural populations to self-sustaining and harvestable levels and to mitigate for 7 percent unavoidable losses for each development, 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 to mitigate for a 2 percent per development unavoidable loss of upriver stocks.
- Investigate the feasibility of habitat modifications in the Wanapum dam tailrace to increase the amount of high quality fall Chinook salmon habitat.
- 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. (this measure is part of the Hanford Reach Agreement)
- Provide a minimum flow of 55 to 70 thousand cubic feet per second (kcfs) in the Hanford Reach during the fall Chinook salmon spawning period. (this measure is part of the Hanford Reach Agreement)
- Through monitoring of redd locations on Vernita Bar within the Hanford Reach, annually establish a Critical Flow for protection of fall Chinook salmon during the pre-hatch, post-hatch, and emergence periods. Flows within the Hanford Reach would be maintained at or above the Critical Flow subject to the constraints of the 3.7 foot draft limit for the Priest Rapids reservoir and the 2 foot draft limit for the Wanapum reservoir. Additional water beyond Grant PUD's ability to maintain the Critical Flow would need to be obtained from upstream operators, which could be coordinated as part of the operating agreements described above. (this measure is part of the Hanford Reach Agreement)
- Within the constraints of the Hourly Coordination Agreement, limit fluctuations in outflow from Priest Rapids dam during the fall Chinook rearing period within the Hanford Reach. (this measures is part of the Hanford Reach Agreement)
- 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. (this measure is part of the Hanford Reach Agreement)
- Continue to use Standard Operating Procedures at both dams to provide operators with turbine operating criteria, spill patterns for use during downstream passage

operations, fishway operation criteria, and other criteria pertaining to upstream and downstream passage of salmon and steelhead.

- To address the effect of the Priest Rapids Project on white sturgeon, construct a white sturgeon conservation facility at the Priest Rapids Hatchery. Broodstock would be obtained from the Hanford Reach or Wanapum Reservoir and the conservation facility would be designed to produce yearling white sturgeon for stocking into the Priest Rapids Project reservoirs. This effort would include experimentation with hatchery supplementation to develop optimal rearing and release strategies and to monitor and evaluate the effectiveness of hatchery releases.
- To address continuing project effects on recreational fisheries, provide funding for upgrades, improvements, and operating costs at the Columbia Basin Hatchery which currently raises 1.4 million fish for stocking in roughly 140 lakes throughout the region (the majority of the lakes are within Grant County, WA).
- Enhance and improve habitat in the lower five miles of Crab Creek to provide recreational fishing enhancements.

Terrestrial Resources

- Enhance riparian/wetland habitat within the lower five miles of Crab Creek and the Priest Rapids Wildlife Area; provide funding in the amount of $30,000 per year to support operations and maintenance related to the enhancement measures and capital funding in the amount of $7.2 million over the course of the license term.
- Develop a transmission line avian collision protection plan; provide capital funding in the amount of $500,000 over the course of the license to support the measures including marking transmission lines, over-head ground wires at specific crossings.
- Develop a habitat management plan for the Upper Wanapum and Lower Crab Creek areas; provide annual O&M funding of $70,000, $1 million for land acquisitions, and capital funding over the term of the license of $2 million to support: (a) development of the plan, (b) noxious weed control on big-game winter range, (c) re-activation of agriculture program in the Colockum area and/or rehabilitation of agricultural lands to native bunch grasses, (d) improvements to riparian/wetland areas at West Bar Slough, (e) development of mountain meadows and maintenance of existing meadows, (f) fertilization of summer and winter ranges, (g) development of water sources, and (h) land acquisitions to consolidate land holdings.
- Develop a northern wormwood conservation plan to protect and monitor populations within the Priest Rapids Project area that would include: continuing annual demographic monitoring for 10 years; working with BOR 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 to support long-term conservation of the species in the amount of $40,000 per year.

- Continue current programs of installation and maintenance of: 48 wood duck nest boxes around the project shoreline; maintenance of 12 raptor nesting, roosting, and perching structures; and installation of 50 waterfowl nesting platforms (mallard nest baskets and goose nesting tubs).

Rare, Threatened and Endangered Species

- Provide $60,000 per year to WDFW to support a fire suppression program in the Colockum, Quilomene, Whiskey Dick, Priest Rapids, Crab Creek, and Buckshot Wildlife Management Areas. Any unused funds at the end of the year would be allocated for habitat rehabilitation.
- Fund a rare, threatened and endangered botanical species protection plan that includes (a) budgeting $7,000 per year for operations and maintenance expenses to address potential habitat disturbances caused by maintenance activities within the project transmission line corridor and any future modifications in the number and/or configuration of transmission lines and structures; (b) a provision for developing a construction schedule of any future projects to avoid disturbance of rare species, (c) a provision for conducting pre-construction surveys, (d) a provision for identifying measures to protect any species found during the surveys, (e) a provision for developing an implementation schedule for protective measures, and (f) a provision for 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) a description of the methods to be employed, (b) a provision to map and quantify population trends, (c) an implementation schedule, (d) a provision and schedule for reporting and consulting with appropriate agencies regarding the monitoring results, and (e) providing $13,500 per year to the Washington Department of Natural Resources Natural Heritage Program for funding and management of research information to further the knowledge of the ecology of rare plants in the project area.
- Develop a bald eagle perching and roosting tree enhancement and protection program.

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.[6]
- Finalize a Historic Properties Management Plan, in consultation with the established

[6] We recommend including provisions for the continuation of this commitment in the final Historic Properties Management Plan.

Cultural Resources Working Group.

Recreation, Land Use and Aesthetic Resources

- Finalize its draft recreation resource management plan (RRMP) that defines the management of existing and future recreation resources associated with the project, including operation and maintenance costs; recreation monitoring; interpretation and education; integration of recreation resources with other resource management needs; and review. The plan will be guided by an adaptive management strategy.
- Provide funding (divided equally between Kittitas County and Grant County Sheriff's Offices) for one full-time law enforcement officer and provide funding to WDFW for one full-time visitor management/law enforcement officer.
- Concentrate new recreation development in suitable areas that are compatible with the draft shoreline management plan.
- Finalize its draft shoreline management plan and manage lands accordingly; protect the scenic quality of the mid-Columbia River and its surrounding landscape.
- Develop and implement an aquatic nuisance plant management program that will include information and signage about invasive plant species at key recreation sites within the project area.

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 Priest Rapids 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 Priest Rapids Project 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 $107,799,000 ($11.05/MWh), and an annual net benefit of $269,546 ($27.63/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, 4(e), and 10(j) of the Federal Power Act (FPA), or modifications thereof, as noted. Additional staff-recommended measures include the following:

Aquatic Resources

- Develop a detailed fishery operations plan.
- Investigate the gate seals at Wanapum dam as a source of mortality.
- Develop and implement a Habitat Mitigation Plan for upriver stocks.
- Develop and implement a performance evaluation plan for salmon and steelhead mitigation and enhancement measures.
- Conduct hatchery effectiveness monitoring.
- Report all occurrences of bull trout in the project area to Interior.
- Components of the Pacific Lamprey Management Plan.
- Develop and implement a white sturgeon management plan.

Terrestrial Resources

- Develop and implement a terrestrial and aquatic invasive species plan.
- Develop and implement a single habitat management plan per Grant PUD's revised proposal.

Recreation, Land Use and Aesthetic Resources

- Conduct recreational use monitoring on project lands, including BLM lands, every 6 years rather than every 12 years as proposed by Grant PUD.
- Provide additional signage at identified recreation sites.

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 Priest Rapids Project would have an annual power value of $377.3 million ($38.7/MWh), an annual production cost (levelized over the 30-year period of our analysis) of $107.8 million ($11.0/MWh), and an annual net benefit of $269.6 million ($27.6/MWh) under the staff alternative. The economics of the staff alternative are very nearly the same as for the proposed project. Although the staff alternative proposes some additional measures not included in Grant PUD's proposal, the cost of additional measures recommended by staff are offset by the subtraction of costs for some of the measures proposed by Grant PUD that are not recommended by staff. The staff alternative does not include the Columbia Hatchery upgrade for which Grant PUD proposes to provide $1,000,000 for capital improvements and $100,000/yr for

operation and maintenance; $100,000 annually to fund Kittitas County security personnel; or $1,000,000 to fund the acquisition of unspecified terrestrial resources mitigation lands.

Section 4(e) of the FPA 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 BOR submitted the preliminary terms and conditions pursuant to section 4(e). For a summary of these preliminary conditions, see section 2.3.1.

Section 18 of the FPA, 16 USC § 811, states that the Commission shall require construction, maintenance, and operation by a licensee of such fishways as the Secretaries of the U.S. Department of Commerce and the U.S. Department of the Interior (Interior) may prescribe. In a letter filed on May 27, 2005, NOAA Fisheries provided preliminary fishway prescriptions for salmon and steelhead at the Priest Rapids Project. In a letter filed on May 26, 2005, Interior filed preliminary fishway prescriptions for salmon, steelhead, bull trout, and Pacific lamprey at the Priest Rapids Project. Both agencies indicated that they would file any modifications to their preliminary prescriptions within 60 days of the close of the comment period for the DEIS. For a summary of these prescriptions, see section 2.3.1.

The Staff Alternative does not include several of the section 4(e) conditions, section 18 prescriptions, as well as some recommendations filed by Interior, National Marine Fisheries Service, and WDFW, pursuant to section 10(j) of the FPA. 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 DEIS 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, 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.