


**US Department of the Interior  
Bureau of Reclamation  
Columbia-Pacific Northwest Regional Office  
Boise, Idaho**

**FINDING OF NO SIGNIFICANT IMPACT**

**Kachess Dam Safety of Dams Modification Project  
Easton, Washington**

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OXFORD**

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Area Manager  
Columbia-Cascades Area Office

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Date

FONSI Number: PN-FONSI 22-07

## **Mission Statements**

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

# **Kachess Dam Safety of Dams Modification Project Final Environmental Assessment**

Proposed action: Reclamation is proposing to reduce the risk of dam failure by performing the following improvements: constructing an access road, preparing the site, developing staging areas to support construction and long-term maintenance, extending and lining the conduit, installing a diaphragm filter around the conduit and a stability berm on top of the filter, and installing an auxiliary drain below the outlet channel. Temporary disturbance during construction would include approximately 11 acres of surface disturbance. Permanent disturbance would include approximately 4 acres of permanent surface disturbance.

Lead agency: Bureau of Reclamation, Columbia-Pacific Northwest Region 9, Columbia-Cascades Area Office

Responsible official: Area Manager, Bureau of Reclamation, Columbia-Pacific Northwest Region 9, Columbia-Cascades Area Office

Coordinating agencies: United States Army Corps of Engineers  
United States Fish and Wildlife Service  
Washington Department of Ecology

For further information,  
contact: Candace McKinley  
Environmental Program Manager  
Bureau of Reclamation, Columbia-Cascades Area Office  
1917 Marsh Rd.  
Yakima, WA 98901  
cmckinley@usbr.gov

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# Finding Of No Significant Impact

## Introduction

In compliance with the National Environmental Policy Act of 1969, the Bureau of Reclamation (Reclamation) prepared this Kachess Safety of Dams (SOD) Modification Project Environmental Assessment (EA) to assess the potential consequences of a proposed modification to Kachess Dam and its appurtenant spillways in the Yakima River basin in west-central Washington.

Kachess Dam, located about 14 miles northwest of Cle Elum, Washington, was constructed between 1910 and 1912. The dam was completed in 1912 to increase the storage capacity in an existing natural lake. Along with Keechelus Dam to the west and Cle Elum Dam to the east, Kachess Dam forms one of the upper basin storage reservoirs of the Yakima Project.<sup>1</sup> The 115-foot-high, 1,400-foot-long, earth-filled Kachess Dam created a reservoir with an actively managed capacity of 239,000 acre-feet.<sup>2</sup> The reservoir typically fills in the winter and spring. It is used for irrigation and fisheries-enhancement purposes in the summer and fall. Reclamation owns and operates the dam; the Yakima Field Office of the Columbia-Cascades Area Office is the entity responsible for operations.

Reclamation has identified seepage and internal erosion issues through the dam embankment along the outlet works conduit, which conveys water from the reservoir to the Kachess River downstream. As reservoir water levels rise, water begins to seep in the downstream end of the conduit. The seeping water begins to scour and erode the outlet works, creating voids or holes within the dam. The eroded materials leave the conduit and are deposited into the toe drain—or the “horseshoe”<sup>3</sup> drain—surrounding the downstream end of the conduit or into a large repository formed by continuous existing voids in the conduit.

As erosion intensifies, water continues to seep, and sinkholes appear in the downstream base of the dam. Combined with the pressure of the water in the reservoir behind the dam, these existing voids can crack or expand, further impacting the dam’s integrity. In other words, water seeping through the dam embankment and the soils surrounding the conduit carries soil materials with it and leaves behind voids, which impact the dam’s stability. This internal erosion creates a risk of potential dam failure.

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<sup>1</sup> In 2013, the Washington legislature authorized funding for the initial development phase of the Yakima Basin Integrated Plan, a consensus-based effort to assure sustainable water supplies for families, farms, and fish in the Yakima River basin over the next 30 years. Projects and activities outlined in the plan’s first phase are designed to quickly improve streamflows, habitat, and fish passage, and secure water for farms, cities, and industry, especially during times of drought and in response to climate change.

<sup>2</sup> A reservoir is a managed surface water system, consistent with terminology used by Reclamation. Specifically, Reclamation defines “reservoir” as “[a] body of water impounded by a dam and in which water can be stored. Artificially impounded body of water. Any natural or artificial holding area used to store, regulate, or control water. Body of water, such as a natural or constructed lake, in which water is collected and stored for use.” Accordingly, Reclamation refers to the waterbody behind the dam as Kachess Reservoir.

<sup>3</sup> “Horseshoe” is a design term based on the shape and configuration of the drain.

As a result, Reclamation began investigating Kachess Dam to understand the extent of the safety risk it presents under the Dam Safety Priority Rating (DSPR) system. This system provides a means for Reclamation to establish the urgency of risk management activities and the relative priority of these actions within the overall inventory of dams. Kachess Dam was previously designated as a DSPR 3 facility (moderate to high priority). This category is reserved for annualized life loss risks or failure probabilities estimated to be moderate to high with generally moderate to high confidence. Based on Reclamation's recent investigations, the dam is now judged to be in the DSPR 2 category (urgent priority). This category is used for situations where expedited action to reduce the risk of failure may be appropriate. A timely transition into the final design process will help ensure a long-term risk reduction without delay.

With this rating change, Reclamation has determined that, although the estimated risk is high, the dam's overall condition is good for its age with no significant adverse performance to date; further, the responsible office does a good job of monitoring the dam and responding to any concerns in a timely manner. However, the risk of failure is comparatively high such that timely modification of the dam is necessary. The primary reason is that, while the dam is currently stable, seepage in the areas of concern is both quantifiable and predictable over the normal operating range. The recommended interim risk reduction action is therefore focused on enhanced performance monitoring. The need for additional interim risk reduction actions will be revisited if conditions change prior to the completion of the dam safety modification.

Accordingly, to prevent eroded soils from exiting the dam, Reclamation is proposing this project to filter and monitor the seepage. Reclamation's primary project goals are to limit internal erosion and decrease the risk of dam failure with moderate certainty; its secondary project goal is to limit impacts on fish and irrigation.

The purpose of and need for the proposed project include:

1. Implementing cost-effective measures to reduce the risks, per Reclamation's Public Protection Guidelines
2. Maintaining water deliveries to irrigation districts, tribes, and others throughout the Yakima River basin
3. Minimizing impacts on the environment
4. Maintaining water flows for endangered species

As part of its SOD program mission, Reclamation is committed to ensuring its dams do not present unacceptable risk levels to people, property, and the environment. These requirements result in a need for Reclamation to implement corrective action to bring static and hydrologic risks at Kachess Dam below public protection guidelines, while minimizing impacts on the environment.

## **Alternatives**

This EA analyzed two alternatives: the No Action Alternative and the Proposed Action Alternative (Proposed Action).

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## Summary of the No Action Alternative

Under the No Action Alternative, there would be no structural or operational changes to Kachess Dam or the spillway. Reclamation would not prepare the site or the access road and would not extend and line the conduit. Reclamation also would not install a filter or a stabilization berm. Accordingly, the dam and spillway would not be improved, and no changes to the operation of Kachess Dam would occur.

Without action, the seepage and internal erosion issues through the dam embankment along the outlet works conduit, which conveys water from the reservoir to the Kachess River downstream, would continue (see Figure 2-1, No Action, in Appendix A). Soil materials carried by the seepage would leave behind voids within the embankment. This internal erosion would perpetuate a risk of potential complete dam failure.

As stated above, as part of its SOD program mission, Reclamation is committed to ensuring its dams do not present unacceptable risk levels to people, property, and the environment. These requirements result in a need for Reclamation to implement corrective action to bring static and hydrologic risks at Kachess Dam below public protection guidelines, while minimizing impacts on the environment. Thus, this alternative would not meet the purpose of, or need for, Reclamation's action.

## Summary of the Proposed Action

Reclamation proposes to reduce the risk of dam failure by performing the following improvements:

- Constructing an access road
- Preparing the site
- Developing staging areas to support construction and long-term maintenance
- Extending and lining the conduit
- Removing the weir
- Installing a diaphragm filter around the conduit and a stability berm on top of the filter
- Installing an auxiliary drain below the outlet channel

The modified embankment dam, stability berm, and outlet works would resemble a T-shaped mound.

Reclamation does not anticipate reservoir-level restrictions to occur. Also, Reclamation would time construction of the extension and lining of the outlet works to avoid major issues with water deliveries. Currently, Reclamation plans to comply with maintaining minimum flows through the dam throughout the project, as established through negotiations with several stakeholders, including the Washington Department of Fish and Wildlife, Confederated Tribes and Bands of the Yakama Nation, United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and various irrigation districts.

Reclamation is prepared to have up to four 6- to 12-hour conduit outages for installing the new elements of the outlet works. During these outages, Reclamation would plan to maintain at least 10 cubic feet per second (cfs) of minimum flows in the Kachess River. Reclamation would do this either by relying on passing water over the spillway or by pumping water into the river when the reservoir is above 2,245 feet, which occurs for most of the time in most water years.

To increase the likelihood of providing 10 cfs to the Kachess River during the four conduit outages via the methods listed above, Reclamation would rely on the following strategies:

- Time outages to coincide with times when the spillway can provide water
- Provide incentives to the contractor to limit the duration and/or frequency of outages
- Secure the necessary materials before 2024 to facilitate rapid installation while eliminating the potential for schedule impacts from availability or shipping issues
- Communicate with the NMFS and USFWS early and often about reservoir and water year predictions

In addition, if Reclamation's plan to employ pumps to maintain minimum flows when passing water over the spillway is not possible, Reclamation would employ pumps in the following fashion:

- Place pumps in the intake of the spillway or on the dam crest.
- Maintain pumps to ensure risks are not imposed on the reservoir and the dam.
- Propose to use two pumps with a capacity of 5 cfs each. Reclamation would require redundancy to limit any risk associated with pump outages and shutdowns. With redundancy, there would be an estimated four pumps (two primary and two backup pumps).
- Include NMFS-compliant fish screens with the pumps.
- Place intake lines in a way to limit effects on the dam face and reservoir bed.

If Reclamation is not able to either pass water over the spillway or pump during one of the four possible conduit outages, no flow from the reservoir would be released for up to 6 to 12 hours during that period; however, seepage from the dam and groundwater recharge would continue. In such a potential event, Reclamation estimates that stopping releases from the reservoir (at 30 cfs) for 6 to 12 hours would result in Kachess Reservoir holding approximately 30 acre-feet of water. This could result in a temporary increase in the reservoir's elevation by approximately 0.005 inches in one such event. This change in water level is outside the accuracy of water surface elevation instruments. If necessary, the Keechelus Reservoir would be used to compensate for water deliveries; accordingly, Keechelus Reservoir would have to release an extra 30 acre-feet of water, which would lower the reservoir level by approximately 0.005 inches.

During a conduit outage without supplementing water via the spillway or pumping, the construction contractor would adhere to a dewatering plan. A draft plan is provided in Appendix C of the biological assessment (BA). Reclamation will finalize the plan in coordination with the USFWS, NMFS, and other state agencies closer to the actual event, when water levels can be forecasted. Information regarding fish handling and removal is also provided in the dewatering plan and discussed under Conservation Measures and Analysis in the NMFS's Endangered Species Act



Section 7(a)(2) Biological Opinion (BO) and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Kachess Dam Safety of Dams Modification, Kittitas County, Washington (NMFS BO; NMFS 2022).

Over the course of the project, Reclamation anticipates that the maximum disturbance area would be approximately 11 acres, with 4 acres of permanent disturbance because of the project. For the other 7 acres that would be reclaimed, all earth areas capable of supporting vegetation, which the project has exposed or disturbed, would be graded to a stable grade and revegetated. Where seeding is expected to have a high probability of success, the site would be seeded with a suitable native seed mix and protected from erosion with weed-free mulch or other suitable biodegradable erosion-control protection. Reclamation would collaborate with the US Forest Service on revegetation practices to develop the revegetation plan, with input from the Washington Department of Fish and Wildlife and the US Army Corps of Engineers.

Construction is expected to occur between April 2023 and July 2025. Construction sequencing would occur as follows:

- Phase 1: During the first phase of construction (April to October 2023), Reclamation would work on developing the access road and contractor use areas. Accordingly, this phase of construction would involve clearing and grubbing of trees on the site. Reclamation plans to work on tree clearing, chipping, and shredding between May and June 2023. Reclamation would haul trees to a designated US Forest Service lot. Hauling would occur between June and July 2023. Access road construction would occur from July to early October 2023. Contractor use areas would be developed from May to July 2023.
- Phase 2: During the second phase of construction (January 2023 to July 2025), Reclamation would focus on fabrication and delivery of pipes to the project area. It also would work on replacing the outlet works. Excavating the foundation for the conduit extension would occur between January and February 2024. Reclamation would expect sand delivery to occur in May 2024, but this schedule could be revised closer to the actual construction. The remaining elements would occur after May 2024, with refinements to this schedule occurring closer to the actual construction date.

Other details related to site preparation and construction can be found in the USFWS’s ESA Section 7(a)(2) BO Habitat Consultation for the Kachess Dam Safety of Dams Modification, Kittitas County, Washington (USFWS BO; USFWS 2022)

## Summary of Impacts

Reclamation’s resource specialists analyzed and reviewed 16 resources. The following eight resources were eliminated from full consideration in the EA: utilities, recreation, Indian trust assets, sacred sites, land use, environmental justice, public health and safety, and visual resources. The rationale for their exclusion can be found in **Section 2.4** of the EA. In addition, resource reports on these resources are included in **Appendix B** of the EA. There would be a range of effects on the other eight resources, as summarized below.

- **Air Resources**—There would be temporary and localized fugitive dust, greenhouse gas emissions, and other air pollutants. Reclamation would minimize these using standard dust control and other best management practices (BMPs). These measures are described in **Chapter 3** and **Appendix B** of the EA. There would be no significant effects.
- **Water Resources**—There would be the potential for decreased water quality, increased sedimentation, and the potential for impacts on flows during modification of the conduit. There would be no significant effects on the dam’s ability to meet water demands. Reclamation would mitigate other effects through design features, BMPs, and other environmental commitments. The project would require a Clean Water Act (CWA) 404 permit and possibly a CWA 401 water quality permit, as well as an associated dewatering plan, erosion-control plan, revegetation plan, and BMPs. Reclamation’s Joint Aquatic Resources Permit Application (JARPA) form includes a copy of the revegetation plan, prepared by the US Forest Service Region 6 Restoration Services Team.

Revegetation techniques for this project would be guided by a restoration approach developed by the Federal Highway Administration, the US Forest Service, and other collaborators. Plant material would be collected from the appropriate provisional seed zone to ensure the use of locally adapted, genetically appropriate native plants in the project area. Parallel to the wetland, planting would occur in a higher density to act as a long-term filtration buffer.

Reclamation’s dewatering plan is attached both to its BA and to its JARPA form. It details the Kachess River flow management schedule for dewatering and fish recovery as well as the methods that would be used to capture, hold, and release fish to avoid impacts on their species. These documents also incorporate the measures that would be used to mitigate or eliminate impacts on the site, including culvert design development, and filling and reseeded of the slopes after construction. As a result, there would be no significant effects.

- **Geology and Soils**—There would be the potential for effects related to disturbance caused during construction. Erosion-control measures and other BMPs, including the developed revegetation plan and the conservation measures found therein, would eliminate or reduce such effects. These effects are enumerated in **Chapters 2** and **3** of the EA and in elements of the JARPA form and State Environmental Policy Act checklist. Overall, there would be no significant effects.
- **Biological Resources**—There would be the potential for effects related to flow changes and effects related to vegetation removal. Conditions of the CWA permit, the revegetation plan, and the dewatering plan, and consultation efforts with the USFWS and NMFS would avoid, minimize, or mitigate impacts on wetlands and aquatic habitats. Project-specific coordination and consultation will remain ongoing to ensure no significant effects.

The NMFS and USFWS have found that the details of the revegetation and dewatering plans and the BMPs found in the BA to reduce sediment disturbance during construction will ensure the project would have minimal effects on Middle Columbia River steelhead and the ability of critical habitat to support steelhead in the project area (NMFS 2022; USFWS 2022).

The NMFS and USFWS have determined that measures included in the revegetation and dewatering plans and the BMPs found in the BA or BO designed to avoid, minimize,

mitigate, or otherwise offset the Proposed Action's impact on essential fish habitat would result in no significant impacts (NMFS 2022; USFWS 2022).

The USFWS also identified that the grubbing, removal, and hauling of trees would not result in significant impacts. Removal and hauling of the trees to the US Forest Service lot also would not result in significant impacts, given the baseline activity already associated with the site and the haul road. Later, some of these trees would be moved from the lot to other sites to serve as fish habitat in federal and state projects. As a result of these actions, the USFWS has found that the grubbing and removal of trees would not result in significant impacts (USFWS 2022).

Therefore, there would be no significant effects from the Proposed Action on the federally listed species under Section 7 of the Endangered Species Act—Bull Trout (*Salvelinus confluentus*), steelhead trout (*Oncorhynchus mykiss*), and northern spotted owl (*Strix occidentalis caurina*)—that are potentially present in or adjacent to the project area.

- Noise and Vibration—There would be no significant effects.
- Transportation and Traffic—There would be no significant effects.
- Cultural Resources—Reclamation has completed an archaeological survey and assessment of the built environment as part of this project's identification efforts. Due to the project's potential to affect traditional cultural properties (TCPs) of religious and cultural significance to Indian tribes, which may be located in the area of potential effect, and further clarification of the nature of the effects on known properties based on the TCP studies being conducted by the tribes, Reclamation has consulted with the Washington Department of Archaeology and Historic Preservation (DAHP) and the Advisory Council of Historic Preservation in compliance with Section 106 of the National Historic Preservation Act. Reclamation worked with DAHP, the Washington State Historic Preservation Officer, the Advisory Council of Historic Preservation, the Confederated Tribes and Bands of the Yakama Nation, the US Forest Service, and the Confederated Tribes of the Colville Reservation to develop a programmatic agreement to allow completion of appropriate identification efforts while enabling timely implementation of the project. The programmatic agreement includes a series of stipulations to account for the project's effect on historic properties.
- Additional identification efforts are in progress to further inform the understanding of the significance of TCPs and the nature of the effects on TCPs from the project. Project-specific coordination and consultation will remain ongoing to ensure no significant effects. As a result, there would be no overall significant effects as a result of this project.
- Socioeconomic Resources—There would be no effect.

## Environmental Commitments

To minimize or mitigate adverse effects as part of the Proposed Action, Reclamation would implement or incorporate the environmental commitments listed in **Chapter 3** of the EA, in the resource reports in **Appendix B** of the EA, throughout the CWA permitting requirements, and in the programmatic agreement developed with the DAHP. Reclamation also would implement or incorporate the conservation measures identified through consultation and coordination with the USFWS and NMFS.

## **Finding of No Significant Impact**

Based on the analysis presented in the EA, Reclamation finds that there would be no significant impacts associated with the Proposed Action. Reclamation makes this finding of no significant impact pursuant to the National Environmental Policy Act of 1969 (42 United States Code 4321 et seq.) and the Council on Environmental Quality implementing regulations (40 Code of Federal Regulations 1500–1508). Reclamation has determined that the Proposed Action does not constitute a major federal action that would significantly affect the human environment. Therefore, Reclamation will not prepare an environmental impact statement.