Supplement Analysis
for the
Columbia River System Operations Environmental Impact Statement
(DOE/EIS-0529/SA-03)

Bonneville Power Administration
Department of Energy

Background

In September of 2020, Bonneville Power Administration (Bonneville) along with the U.S. Army Corps of Engineers (Corps) and Bureau of Reclamation (Reclamation) issued a joint Record of Decision (ROD) for the Columbia River System Operations Environmental Impact Statement (CRSO EIS) (DOE/EIS-0529). The CRSO EIS, dated July 2020, addressed the ongoing operations, maintenance, and configuration of the 14 federal Columbia River System (CRS) projects on the Columbia and Snake rivers. The 14 projects are Libby, Hungry Horse, Albeni Falls, Grand Coulee, Chief Joseph, Dworshak, Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville. The co-lead agencies (Corps, Reclamation, and Bonneville) share responsibility and legal authority for managing the CRS. These three co-lead agencies coordinate the operation of the CRS and worked together to develop the EIS. The Corps and Reclamation develop operating requirements for their projects. These are the limits within which a reservoir or dam must be operated. Some requirements are established by Congress when a project is authorized, while others are established by the agencies based on operating experience. Within these operating limits, Bonneville schedules and dispatches power. This process requires continuous communication and coordination among the three agencies.

As part of the CRSO EIS, the agencies considered six alternatives to CRS operations, maintenance, and configuration. The agencies analyzed the effects of these alternatives on the human environment, including environmental, economic, and social impacts. On February 28, 2020, the co-lead agencies released for public comment the Draft CRSO EIS describing the effects of these alternatives and identifying the agencies' Preferred Alternative. The 45-day public comment period ended on April 13, 2020, and the agencies reviewed and responded to these comments in the Final CRSO EIS. The co-lead agencies released the Final EIS on July 28, 2020, and the agencies issued a joint ROD adopting the Selected Alternative identified in the Draft EIS on September 28, 2020.

Modifications to some of the operational measures identified under the Selected Alternative were proposed in October 2021. On October 20, 2021, Bonneville completed a supplement analysis (SA-01) documenting that proposed modifications to operational

measures would not result in substantial modifications to the Selected Alternative and were consistent with the effects described in the Final CRSO EIS.

Moreover on August 4, 2022, Bonneville completed a second supplement analysis (SA-02) documenting that the BPA-funded Energy and Environmental Economics, Inc. study on the future value of the lower Snake River dams did not present new circumstances or information relevant to environmental concerns not addressed in the CRSO EIS.

This supplement analysis (SA) evaluates proposed modifications to certain measures identified under the Selected Alternative on the lower Snake and Columbia Rivers. This SA analyzes whether the proposed modifications to the Selected Alternative represent a substantial change to the Selected Alternative or significant new circumstance or information relevant to environmental concerns that were not addressed by the EIS, such that either would warrant the need for a supplemental EIS.

Proposed Modifications

The co-lead agencies are evaluating three proposed operational modifications during spring and summer spill operations: (1) adaptively managing pool elevations if adult delays occur, including relaxation of Minimum Operating Pool (MOP) restrictions; (2) clarifying that The Dalles Dam spill percentage is allowed to exceed 40%, up to 125% total dissolved gas (TDG); and (3) modifying Lower Monumental Dam performance standard spill (PS spill) to 40% from 30 kcfs.[1] The first two proposed modifications reflect actions that occurred during 2022 spill operations, and the third proposed modification was partially implemented under high flow conditions in 2022.[2]

For the first proposed modification, if adult delays are observed during increases in river flows and implementation of eight-hour PS spill blocks, MOP restrictions would be relaxed to allow ponding to attain the full eight hours of PS spill at Little Goose and Lower Monumental dams. This proposed modification prioritizes meeting PS spill at Little Goose Dam, which is consistent with 2022 operations to assist with adult fish migration. Juvenile travel times should be minimally impacted during periods of high flows. This operational adjustment is consistent with the 2022 Fish Operations Plan (FOP). This proposed modification may also be used at

[1] Prior to the start of 2023 spring spill season, the Corps is also analyzing whether any changes are needed to tailwater gauges to ensure safe navigation and appropriate entrance depths for fish ladders. No operational changes are proposed as part of the Corps' analysis or will result from that analysis. Therefore, there is no further analysis of this action in this SA.

[2] *See* TMT meeting minutes from June 10, 2022 page 3, *"Have use of the full pool at Ice Harbor (437-440 feet) to be able to store water and smooth out the swings in outflow from upstream projects implementing performance standard spill; See* https://pweb.crohms.org/ftppub/water_quality/12hr/table/tdg_overview.html; TMT meeting minutes from June 10, 2022 and page 2, *"Based on the TMT-coordinated request to modify operations in the Lower Snake River to improve adult Chinook passage, Action Agencies will plan on implementing the adjustments coordinated, as feasible and as conditions allow."*

Lower Granite and Ice Harbor dams if there are adult fish passage delays and will be coordinated through the existing Regional Forum, i.e. the Technical Management Team.

For the second proposed modification, the Corps will continue to utilize reductions in spill at John Day Dam to manage TDG levels at The Dalles Dam. Specifically, during 2023 spring spill operations, The Dalles Dam operations will follow the spill operations implemented by the Corps as outlined in the 2022 FOP. The 2023 FOP will include language to allow for continued spill operation of The Dalles Dam above 40% spill (as needed), similar to operations implemented in 2022 for TDG management and carrying reserves, which may not require reductions in spill at John Day Dam. Any modifications to planned operations will follow the provisions of the 2023 FOP.

The first two proposed modifications are consistent with 2022 operations, and would not change the existing level of environmental effects and, therefore, are not analyzed further in this SA. For this reason, this SA focuses on the proposed modification to Lower Monumental Dam because it represents a change to current operations that could have potential environmental effects. Additionally, the agencies will continue to implement all other CRS operations consistent with the Selected Alternative as outlined in the CRSO EIS ROD and subsequent operational changes as discussed in SA-01. Finally, operations will continue to be implemented consistent with other guiding documents including the annual Fish Passage Plan, including the FOP, Water Management Plan, and seasonal Water Management Plan updates. This includes, but is not limited to, reservoir elevation operations (or MOP) on the lower Snake and Columbia rivers and the summer spill component of the *Juvenile Fish Passage Spill Operation* measure.

Thus, the agencies propose to modify the spring component of the *Juvenile Fish Passage Spill Operations* measure described in the CRSO Final EIS in Section 7.6.3.9 and the CRSO EIS ROD in Section 6.3.1.1.1 for 2023 at Lower Monumental Dam. As explained in those sections of the EIS and ROD, the juvenile spill operation consists of operating most projects on the lower Snake River to benefit juvenile outmigration. To that end, during a 24-hour period, most projects operate up to the 125% TDG cap for 16 hours. For the remaining 8 hours occurring during daytime, projects generally spill at the PS spill level to address unintended or unforeseen consequences, such as delayed adult migration in the tailraces or areas immediately downstream of each dam, resulting from spill levels up to 125% TDG. This also allows for increased hydropower generation during peak demand while still providing for high spill levels.

Specifically, the operational modification that is the focus of this SA would change the PS spill levels described in the CRSO Final EIS Section 7.6.3.9 (Table 7-3) at Lower Monumental Dam. The proposed modification would adjust the PS spill level at Lower Monumental Dam occurring between April 25 and June 20. Modifying the *Juvenile Fish Passage Spill Operations* measure would increase the level of PS spill to 40% from the level set at 30 kcfs under the current operation after the established adult trigger is met. In adopting the change to PS spill, the agencies would also consider alternative spill patterns. Consistent with in-season

modifications made in 2022, the Corps will implement a 40% PS spill operation up to 8 hours per day.[3] Under low flow conditions, a 40% spill operation is expected to improve tailrace hydraulics, compared to the flat 30 kcfs PS spill operation as implemented in 2022. Improved tailrace conditions would benefit downstream and upstream migrating fish. This modification is expected to also aid in better flow management in the lower Snake River during high flows as experienced and implemented in 2022. Considering forecasted turbine availability at Lower Monumental Dam for spring 2023, the change to 40% during PS hours will result in more spill than the 30 kcfs spill requirement when flows are above 75 kcfs and less than 200 kcfs. The proposal is estimated to result in 10 kcfs more spill on average and a 2023 reduction in approximately 32,300 MWh and up to 68,000 MWh during PS spill operations.

Analysis

Based on average flows between 2010 and 2022, a change to 40% spill would be anticipated to result in more spill during PS spill hours, on average, than the 30 kcfs spill level in the current operation. This modification could result in a slight change in effects to water quality, fish, and power generation, but effects to other resources are not expected given the minor change to operations. In general, this modified spill level would result in similar effects to resources considered in the CRSO Final EIS, as explained below. When considering the modified spill level in the context of all the measures included as part of the Selected Alternative, it does not represent a substantial change to the Selected Alternative and is consistent with the effects described in the CRSO Final EIS.

Through discussions with the National Marine Fisheries Service and U.S. Fish and Wildlife Service, the co-lead agencies have confirmed that the modification to the Selected Alternative would fall within the range of effects considered in the ESA Section 7 consultations on the operations and maintenance of the CRS and would not require reinitation of Section 7 consultation. Similarly, the proposed modification would comply with all applicable laws, including the Clean Water Act and existing water quality standards, the National Historic Preservation Act, and the Northwest Power Act.

As discussed in more detail below, the anticipated effects from the proposed modification fall within the scope of effects analyzed in the Final EIS, which analyzed effects from the *Juvenile Fish Passage Spill Operations* measure. Accordingly, the following discussion specifically evaluates the proposed modification relative to the impacts evaluated in the Final EIS and the Selected Alternative for water quality, fish, and power to determine whether that modification represents a substantial change to the Selected Alternative or significant new circumstance or information relevant to environmental concerns.

1. **Water Quality**

The modification to the spring component of the *Juvenile Fish Passage Spill Operations* measure could slightly extend periods of elevated TDG levels at Lower Monumental Dam if there are average-to-high flow conditions; however, in low flow conditions, there

[3] *See* TMT meeting minutes from June 10, 2022 and page 2, *"Based on the TMT-coordinated request to modify operations in the Lower Snake River to improve adult Chinook passage, Action Agencies will plan on implementing the adjustments coordinated, as feasible and as conditions allow."*

could be less spill overall. In Section 3.4.3.7, the Final EIS specifically analyzed effects from the measure entitled, "*Set juvenile fish passage spill to not exceed 125 percent TDG*," generally finding increases in TDG saturation (Final EIS Section 3.4.3.7, pages 3-286) over both the spring and summer spill seasons. Under the Selected Alternative, the co-lead agencies would continue to monitor effects from increases in TDG from the proposed change to the *Juvenile Fish Passage Spill Operations* measure in the spring and could exercise their ability to modify spill to adhere to state water quality standards (*See generally* Final EIS Section 7.7.3.3, page 7-88; ROD Section 3.9; ROD Attachment 2, page A2-1; 2022 FOP, Sections 2.1 and 4.1). The Selected Alternative also includes a mitigation action measure entitled "*Temporary Extension of Performance Standard Spill Operation"* (Final EIS Section 7.6.4.2, page 7-44; ROD Section 2.7.3) if there are TDG levels that result in impacts to salmonid or resident non-salmonid fishes or if increased spill levels result in delays to adult passage. If certain biological conditions for gas bubble trauma in the state water quality standards are exceeded or if a delay in adult salmon and steelhead upstream passage is observed, operations would revert to PS spill until the adverse impact to fish is resolved. Because the proposed modification is smaller than the water quality effects from the *Set juvenile fish passage spill to not exceed 125 percent TDG* measure analyzed in the Final EIS, and the co-lead agencies would continue to monitor TDG levels and utilize the *Temporary Extension of Performance Standard Spill Operation* mitigation measure and existing off-ramps in other guiding documents such as the annual Fish Passage Plan, including the FOP, Water Management Plan, and seasonal Water Management Plan updates, if necessary, this modification does not represent a substantial change to the Selected Alternative or significant new circumstance or information relevant to water quality effects.

2. Fish

The proposed *Juvenile Fish Passage Spill Operations* measure modification adjusting PS spill to 40% spill at Lower Monumental Dam could increase the volume of juvenile fish passage spill during daytime hours and may slightly increase effects to fish. These would be consistent with the fish effects analyzed in the Final EIS for the reasons explained below.

A recent Pacific Northwest National Laboratory (PNNL) study found that powerhouse passage probability generally decreases (and spillway passage probability increases) with increasing spill levels at Lower Monumental Dam, especially during high-flow conditions (Harnish et al. "Factors affecting powerhouse passage of spring migrant adults at federally operated hydroelectric dams on the Columbia and Snake Rivers," May 2021, at page 70, Figure 36; at page 82, Figure 44).[4] This study suggests that setting PS spill to a 40% spill level would likely reduce powerhouse encounter rates and increase the overall proportion of juveniles passing through the spillway, contributing to more adults eventually returning to the Snake River system based on decreased potential latent mortality

[4] Harnish, R.A., K.D. Ham, J.R. Skalski, and R.A. Buchanan. 2021. *Factors affecting dam passage routing and in-river survival of juvenile salmonids in the lower Snake and Columbia rivers.* Report prepared for U.S. Department of Energy under Contract DE-AC05-76RL01830 by Pacific Northwest National Laboratory (PNNL-30641).

impacts. Moreover, additional spill occurring during daytime PS spill hours at average-to-high flows would increase spillway passage and improve overall survival of juveniles passing the project and the CRS (*Id.*).

These findings confirm that the effects anticipated from the modified PS spill level at Lower Monumental Dam would be consistent with those evaluated in the Final EIS. In Section 3.5.3.7, the Final EIS analyzes the effects resulting from the operational measure increasing spill levels (i.e., *Set juvenile fish passage spill to not exceed 125 percent TDG* measure) at CRS dams including Lower Monumental Dam during juvenile fish passage spill in spring. Generally, higher spill volumes have the net effect of routing greater numbers of juvenile salmon and steelhead into spill routes with fewer individuals traveling through powerhouse routes, such as fish bypass and turbine routes. The effectiveness of spill to attract fish to pass through the spillway (surface or bottom spill) varies by species, daytime versus nighttime hours, time of year, and other environmental conditions associated with seasonal changes. The Final EIS also found that increased spill under that measure could reduce instances of fish injury and likely contributes to increases in abundance of returning salmon and steelhead (Final EIS Section 3.5.3.7, pages 3-626 to 3-628).

The Final EIS analysis also considered potentially adverse effects to fish resulting from potential TDG exposure due to the higher and prolonged spill levels during the longer time period from March 1 to August 31, finding an increase in reach-average exposure to TDG during those months (Final EIS Section 3.5.3.7, page 3-627). The Final EIS found that TDG exposure has the potential to delay adult upstream passage for migrating salmon and steelhead (Final EIS Section 3.5.3.3, page 3-401). In addition, the Final EIS found that higher spill operations can result in large eddies that slow juvenile migration (Final EIS Section 3.5.3.7, page 3-649). For bull trout, the Final EIS found increased potential for delayed upstream dam passage due to higher spill resulting in elevated TDG levels that potentially degrade feeding, migrating, and wintering habitat in the lowerSnake River, as well as affect bull trout individuals leaving the CRS in May and June (Final EIS Section 3.5.3.7, page 3-675).

The modified *Juvenile Fish Passage Spill Operations* measure adjusting the PS spill level to 40% spill at Lower Monumental Dam would continue mitigation adopted for the Selected Alternative to temporarily extend PS spill upon observing a delay in upstream passage (*Temporary Extension of Performance Spill Standard* mitigation measure in Final EIS Section 7.6.4.2, page 7-44; ROD Section 2.7.3). PS spill protects against unexpected fish effects, such as adult migration delay and gas bubble trauma from spill up to 125% TDG (Final EIS Section 7.6.3.9, page 7-34). The Final EIS found that implementing this mitigation measure as part of the Selected Alternative reduces a potentially adverse effect from TDG to migrating fish (Final EIS Section 7.6.3.9, page 7-34). Moreover, in-season adaptive management will occur if adult delays are identified. However, based on 2022 operations and the implementation of modified PS spill during high flows, additional adverse effects are not expected for upstream migrating spring Chinook salmon (i.e. fish passage delays were not observed at PS spill of up to 40% when implemented during daytime hours).

For the reasons explained above, the proposed modification to PS spill at Lower Monumental Dam would result in effects to fish consistent with those analyzed in the Final EIS, and with the implementation of the mitigation measure and existing off-ramps in

other guiding documents such as the annual Fish Passage Plan, including the FOP, Water Management Plan, and seasonal Water Management Plan updates, there would be no substantial change to the Selected Alternative or significant new circumstance or information relevant to fish effects.

3. Power

The proposed modification to the PS spill component of the *Juvenile Fish Passage Spill Operations* measure at Lower Monumental Dam would reduce hydropower generation during the daily duration for spill operations between April and June. On average, when assuming the satisfaction of adult-abundance criteria, the change in PS spill at Lower Monumental Dam would result in approximately 10 kcfs of additional spill on average, and a 2023 reduction in power generation of approximately 32,300 MWh and up to a maximum reduction in power generation of 68,000 MWh during PS spill operations compared to the current operation.

In Section 3.7.3.6, the Final EIS analyzed the effects resulting in changes to power generation from large increases in spring and summer fish passage spill, and found that the largest decreases occur between March to the end of August when the eight fish passage projects, including Lower Monumental Dam, would operate only at minimum generation levels except for the wettest years under the higher spill levels of the *Set juvenile fish passage spill to not exceed 125 percent TDG* measure (Final EIS Section 3.7.3.6, page 3-978). In addition, the Final EIS analyzed the potential for reliability issues associated with the reduction of hydropower generation during these months and found increased potential for loss of load probability (Final EIS Section 3.7.3.6, page 3-980). The proposed modification adjusting PS spill to a 40% spill level, however, would fall well within the range of effects analyzed in the Final EIS because anticipated decreases in hydropower production would only occur during a period of low regional loads in the spring and would not impact the summer and winter months when demand is higher (e.g., "Firm Load Forecast" affected environment discussion in Final EIS Section 3.7.2.7, page 3-835). Thus, there would be little to no change in effects compared to the Selected Alternative. In addition, Bonneville holds contingency reserves under the Selected Alternative during fish passage spill operations to maintain grid reliability (Final EIS Section 7.6.3.10), which can have the effect of reducing planned spill levels in some circumstances. The FOP includes routine reliability tools and contingency operations to resolve adverse transmission conditions. For these reasons, the proposed operational modifications do not represent a substantial change to the Selected Alternative or significant new circumstance or information relevant to power concerns.

Overall, the proposed modifications would not result in a substantial modification to the Selected Alternative and are consistent with the effects described in the CRSO Final EIS and do not represent significant new circumstance or information relevant to environmental concerns since the issuance of the Final EIS and ROD in 2020. Therefore, Bonneville determined the proposed modifications do not warrant preparation of a supplemental or new EIS.

Findings

Bonneville finds that the proposed activities and potential impacts related to the proposed operational changes are similar to those analyzed in the CRSO Final EIS (DOE/EIS- EIS-0529 2021). There are no substantial modifications to the CRSO EIS ROD Selected Alternative and no significant new circumstances or information relevant to environmental concerns bearing on the Selected Alternative or its impacts within the meaning of 10 CFR § 1021.314(c)(1) and 40 CFR § 1502.9(d). Therefore, no further NEPA analysis or documentation is required.

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Concur:

/s/ Katey Grange Date: *October 31, 2022*
Katey Grange
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