UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3188

WATER
DIVISION

Written Comments Received from Public Hearing on Clean Water Act Section 401(a)(2) Objection to EPA's Draft National Pollutant Discharge Elimination System (NPDES) Permits for Lower Columbia River Federal Hydroelectric Projects

June 7 - 21, 2022

EPA has compiled the written comments received after EPA Region 10's public hearing held on June 7, 2022 regarding Oregon Department of Environmental Quality's (DEQ) objection under Clean Water Act Section 401(a)(2) to EPA Region 10's Draft NPDES permits for federal hydroelectric projects on the Lower Columbia River. EPA accepted written comments from June 7 to June 21, 2022. EPA received 12 letters, with one letter signed by 5 organizations. The letters are as follows:

- Bonneville Power Association
- Columbia River Inter-Tribal Fish Commission
- Columbia Riverkeeper, Northwest Sportfishing Industry Association, Save Our Wild Salmon Coalition, Northwest Environmental Defense Center, and Oregon Chapter of the Sierra Club (*combined letter*)
- Confederated Tribes and Bands of the Yakama Nation
- Northwest Sportfishing Industry Association
- Oregon Department of Environmental Quality
- Pacific Northwest Waterways Association
- Public Power Council
- Region 10 Regional Tribal Operations Committee
- The Freshwater Trust
- U.S. Army Corps of Engineers
- U.S. Bureau of Reclamation

You can also listen to verbal testimony from the June 7, 2022 public hearing at https://www.epa.gov/npdes-permits/public-hearing-proposed-discharge-permits-federal-hydroelectric-projects-lower.

If you experience a problem reading this document with assistive technology, please contact us (R10_Web_Team@epa.gov).

Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

ENVIRONMENT, FISH AND WILDLIFE

June 21, 2022

In reply refer to: E-4

Ms. Jenny Wu
Environmental Engineer, NPDES Permits Section
EPA Region 10
1200 6th Avenue, Suite 155 (19-CO4)
Seattle, WA 98101

Dear Ms. Wu:

The Bonneville Power Administration (Bonneville) appreciates the opportunity to provide comments to the United States Environmental Protection Agency's (EPA) on its evaluation and recommendations on the Oregon Department of Environmental Quality's (ODEQ) objection under the Clean Water Act to EPA's proposed National Pollutant Discharge Elimination System (NPDES) permits for four federal multiple purpose facilities that discharge to the lower Columbia River:

- Bonneville Project., NPDES Permit No. WA0026778
- The Dalles Lock and Dam, NPDES Permit No. WA0026701
- John Day Project, NPDES Permit No. WA0026832
- McNary Lock and Dam, NPDES Permit No. WA0026824[1]

Bonneville markets and transmits the hydropower generated at thirty-one Federal Columbia River Power System (FCRPS) projects, including these four projects listed above.[2] Bonneville, as part of the U.S. Department of Energy, operates as a not-for-profit federal entity, selling cost-based electrical power and transmission services to benefit the Pacific Northwest, including the public bodies and cooperatives that serve domestic and rural consumers. In providing these services, Bonneville must balance multiple public duties and purposes, including: assuring the Pacific Northwest has an adequate, efficient, economical and reliable power supply; promoting energy conservation and the use of renewable resources; and, acting in a manner consistent with

[1] Bonneville previously provided comments on these NPDES permits in two separate EPA public comment processes, and these comments are incorporated by reference.

[2] The Columbia River System (CRS) is a subset of the 31 FCRPS dams and includes 14 projects operated as a coordinated water management system. The 14 CRS projects are comprised of 12 Corps projects and two Bureau of Reclamation ("Reclamation") projects located throughout the Pacific Northwest in the states of Idaho, Oregon, Montana, and Washington. BPA markets and transmits the hydropower generated from these 14 projects. These projects are operated in a coordinated manner for purposes specifically authorized by Congress, including flood risk management, navigation, fish and wildlife conservation, hydropower generation, recreation, irrigation, and municipal and industrial water supply, but the authorized projects vary by project. The four lower Columbia projects are part of the CRS.

the program developed by the Northwest Power and Conservation Council by protecting, mitigating, and enhancing fish and wildlife in the Columbia River basin that are affected by the development and operations of the federal facilities from which Bonneville markets power.[3] The U.S. Army Corps of Engineers (Corps) operates and maintains these four projects for multiple congressionally authorized purposes including flood risk management, navigation, hydropower generation, fish and wildlife conservation, irrigation, recreation, water quality, and municipal and industrial water supply though not every facility is authorized for every one of these purposes. While the Corps is congressionally authorized to operate these four projects for multiple purposes, Bonneville is the federal agency Congress authorized to market and transmit the power generated at these facilities. In return, Bonneville is required to pay, either directly to the Corps, or as a reimbursement to the U.S. Treasury, (1) all costs associated with power-specific operations and assets (e.g., turbines); and (2) a share of "joint costs," which benefit or mitigate, for all purposes of the facility (e.g., fish mitigation, water quality). Any additional costs applied to these four projects as a result of these draft NPDES permits or associated 401 certification will increase Bonneville's costs, which in turn will impact Bonneville ratepayers throughout the Northwest.

Bonneville's comments are separated into two sections: 1) Answering the four questions EPA included in its hearing notice; and 2) Responding to the recommendation EPA provided at the June 7, 2022 hearing.

I. Clean Water Act Introduction

EPA, under its Clean Water Act authority, is proposing to issue NPDES permits to the Corps for four projects on the lower Columbia River for the discharge of pollutants to waters of the U.S.[4] Under Section 401 of the Clean Water Act, a water quality certification is required for a "permit that authorizes an activity that may result in a discharge."[5]

Consistent with the Clean Water Act and its implementing regulations, EPA contacted Washington Department of Ecology (Washington) to request a water quality certification for the four NPDES permits.[6] On May 7, 2020, Washington provided its certification.[7] On May 15, 2020, ODEQ notified EPA it objected to the draft permits and requested a hearing.[8] In its

[3] 16 U.S.C. § 839. Unlike most federal agencies, Bonneville does not receive annual congressional appropriations; instead, the agency is self-financed from revenues received from the sale of power and transmission services. Bonneville utilizes this revenue to not only pay for the continuing costs associated with its programs (including power, transmission, and fish and wildlife investments and maintenance) but also to repay the United States Treasury for the power share of the original federal investment used to construct the Federal Columbia River Power System. The Bonneville Administrator must operate the agency in a manner that allows it to recover its costs "in accordance with sound business principles." 16 U.S.C. § 839e(a)(1). This includes the objectives of setting the lowest possible rates for Bonneville services, while enabling Bonneville to make timely repayments to the Treasury and simultaneously fulfilling multiple public purposes for the benefit of the Pacific Northwest.
[4] 33 U.S.C. 1342(a).
[5] 40 CFR § 124.53(b), (c).
[6] *Id.*
[7] r10-npdes-usace-bonneville-wa0026778-ecology-401-cert-2020.pdf (epa.gov)
[8] r10-npdes-usace-lower-columbia-hydroelectric-facilities-odeq-cwa-objection-2021.pdf (epa.gov) 1-2.

October 8, 2021 letter to EPA reiterating its objection, ODEQ stated the "requirements in the draft permit will not assure attainment of Oregon's water quality standard for temperature."[9] In its objection letter, ODEQ proposed three "supplemental" conditions to the NPDES permits to meet its temperature water quality standards, two of which are already covered in Washington's certification: 1) *Development and Submission of an Implementation Plan; and 2) Regular Reporting.*[10]

The third supplemental condition ODEQ requested, *Initial Study of Temperature,* would require the Corps to study changes to reservoir pool elevations. This condition is similar to actions Oregon previously requested in a preliminary injunction motion in the *NWF v. NMFS* litigation.[11]

II. EPA's First Question: Are additional permit conditions necessary to ensure compliance with Oregon's water quality requirements for temperature?

Since Washington's certification already includes conditions requiring the Corps to develop plans for Water Quality Attainment, regular reporting, and measures to "implement temperature control strategies and meet the load allocations in the Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load," no additional permit conditions are necessary to ensure compliance with Oregon's temperature water quality requirements.

Additionally, the Corps is already incorporating temperature considerations in its operation of Dworshak Dam and at the lower Snake and lower Columbia fish ladders. The Corps utilizes Dworshak Dam for cold water releases to improve temperature conditions in the lower Snake River from July through August. Fish ladders at Lower Granite and Little Goose dams receive cooler water pumped from their forebays[12] to encourage adult salmonid movement past the dams. The Corps has also been monitoring temperature in fish ladders of the lower Columbia dams. The data they collect will be used to consider approaches to affect temperature to improve salmonid migration. The Corps operates a robust temperature monitoring system that provides real-time reporting and coordinates in-season adaptive management with regional salmon managers through weekly Technical Management Team (TMT) meetings. However, as nearly all the federal Columbia and Snake River dams are run-of-river dams, there are limited options for affecting temperature benefits via operational changes. In comparison to storage reservoirs, which can release distinctly cooler water from lower reservoir depths, there is less temperature stratification with depth and more mixing associated with run-of-river dams. In early July 2021, the Corps implemented TMT members' request to reduce spill and pass more water as generation flow at Lower Granite and Little Goose dams to improve downstream temperature conditions during a heat wave.

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[9] *Id.*

[10] r10-npdes-usace-lower-columbia-hydroelectric-facilities-odeq-cwa-objection-2021.pdf(epa.gov) 3-4.

[11] Oregon's Corrected Motion for Preliminary Injunction and Supporting Memorandum, 3:01-CV-00640-SI, ECF 2392 (August 6, 2021) (OR PI Motion). *See also* Proposed Order Granting Oregon's Motion for Injunctive Relief, ECF 2382-2 (July 16, 2021).

[12] A forebay is the area immediately upstream of the dam.

As discussed below, EPA should not include ODEQ's *Initial Study of Temperature* condition for the following reasons. First, ODEQ's condition is both vague and overbroad. ODEQ's condition would direct the Corps to analyze the effects of changing reservoir elevations allegedly for the benefit of water temperatures, but the duration it dictates includes times when water temperatures are not elevated.[13] ODEQ states "The study will focus particularly on water temperatures during the period from July 15 to September 30, *but also shall include analysis for other times of the year that are during key periods of salmonid migration*."[14] ODEQ also does not define when "key periods of salmonid migration" are so BPA has provided comments on the impact of changing reservoir elevations ***at all times of the year*** instead of speculating on what ODEQ intended. ODEQ also does not define what it intends by using the term "salmonid." BPA has provided comments regarding salmon and steelhead, but the vagueness of ODEQ's language raises the question of how ODEQ is considering impacts of its proposed reservoir levels on bull trout migration, a fish listed under the Endangered Species Act (ESA) in the Family *Salmonidae* that migrates past the lower Columbia River dams.

Further, ODEQ has not defined what reservoir levels would be effective at addressing elevated water temperatures. Thus, without a clear articulation of the timeframe associated with ODEQ's condition and with the inclusion of "key periods of salmonid migration", it is clear that this condition is not intended to address water temperature, and is therefore not addressing compliance with water quality requirements as is required. Moreover, even if EPA interprets ODEQ's condition to address water quality requirements, the condition is unclear, and thus suffers from vagueness, and EPA should not include it in the NPDES permits.

For context, since ODEQ does not provide any insight in its objection letter what reservoir levels should be used, BPA must assume it meant the reservoir levels in the OR PI Motion.[15]

Table 3: Injunction for [Lower Columbia River] reservoirs	
Project	MOP with 1.0 ft operating range from March 1 to June 15 starting in 2023
McNary	335.0
John Day	257.0
The Dalles	155.0
Bonneville	70.0

To prepare for EPA's hearing and inform discussions with the State of Oregon, the Corps conducted modeling to evaluate water temperature effects due to changing reservoir elevations.[16] The Corps conducted this analysis to evaluate Oregon's proposed supplemental condition, *Initial*

[13] r10-npdes-usace-lower-columbia-hydroelectric-facilities-odeq-cwa-objection-2021.pdf(epa.gov) 3.
[14] *Id.* (emphasis added).
[15] Proposed Order Granting Oregon's Motion for Injunctive Relief, ECF 2382-2 (July 16, 2021), 5.
[16] U.S. Army Corps of Engineers, Memorandum for the Record. *Discussion of temperature modeling results for Oregon's proposed Minimum Operating Pool (MOP) operation on the Lower Columbia River* (May 24, 2022) (hereinafter "*Corps Memo*").

Study of Temperature.[17] This modeling provides the only known modeling effort by any entity on the potential effectiveness of these operational changes on water temperatures.

The Corps used the CE-QUAL-W2 version 4.5 hydrodynamic model to evaluate temperature differences in two dimensions for current condition normal operating range (current condition) and Minimum Operating Pool (MOP) scenarios using 2011-2015 meteorology and hydrology. The Corps modeled water temperature for the July 15 to September 30 period of interest stated in the objection letter, which has typically been when water temperatures have exceeded the water temperature criteria. The current condition was represented by the Corps' modeling for the Proposed Action Operations selected in the Columbia River System Operations Environmental Impact Statement Record of Decision. As stated above, ODEQ's objection letter does not identify specific reservoir elevations in its objection letter, so the Corps applied the MOP elevations from the OR PI Motion in the *NWF, et al. v. NMFS et al.* litigation.[18] These MOP elevations are outside of the Corps' normal operating ranges and have adverse effects to other affected resources and congressionally-authorized purposes discussed in this comment letter.

In its analysis, project outflows were increased during the five days prior to July 15 to reduce the reservoir elevations to the modeled elevations in Table 1, which is the middle of the OR PI Motion proposed reservoir level ranges for MOP. Outflows were decreased over the five days after September 30 to return reservoir elevations to the normal operating range. The Corps modeled MOP conditions for individual projects instead of modeling the four projects in series as a system. This is an appropriate approach considering that the NPDES permits will be issued for individual facilities whereas cumulative system effects should be addressed using the TMDL process. In EPA's *Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load,*[19] EPA acknowledged the significance of evaluating system effects for non-point sources by writing, "…nonpoint sources of heat in the watershed are subject to the ebb and flow of the system, which includes more than 900 river miles, and which can be affected by a variety of factors that may change on a seasonal, annual or decadal basis."

[17] r10-npdes-usace-lower-columbia-hydroelectric-facilities-odeq-cwa-objection-2021.pdf (epa.gov) 3.
[18] See *supra* note 13.
[19] *Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load,* Appendix I Temperature and Heat Loads, 1.

Table 1. Forebay elevations and date ranges for current conditions and the MOP alternative.

	Date range	Published ft, NGVD29[4]	Modeled (averaged Jul 15 to Sep 30) ft, NGVD29
McNary:			
Normal operating range	year-round	337.0 - 340.0	338.7
MOP[1] Alternative	Jul 15 to Sep 30	335.0 - 336.0	335.4
John Day:			
Normal operating range	Sep 1 to Apr 9	262.0 - 266.5	264.9
Tern nesting operation[2]	Apr 10 to Jun 1	264.5 - 266.5	265.4
MIP operation[3]	Jun 1 to Aug 31	262.5 - 264.5	263.7
MOP[1] Alternative	Jul 15 to Sep 30	257.0 - 258.0	257.2
The Dalles:			
Normal operating range	year-round	157.0 - 160.0	158.2
MOP[1] Alternative	Jul 15 to Sep 30	155.0 - 156.0	155.2
Bonneville:			
Normal operating range	year-round	71.5 - 76.5	75.8
MOP[1] Alternative	Jul 15 to Sep 30	70.0 - 71.0	70.3

[1] MOP is defined as the elevations proposed by Oregon in the OR PI Motion.
[2] Forebay restriction for increased elevation to dissuade Caspian tern nesting.
[3] Forebay restriction for the minimum irrigation pool (MIP) juvenile fish passage operation while meeting irrigation needs.
[4] Standard elevation units in the day-to-day operation of the projects are feet above mean sea level using the National Geodetic Vertical Datum of 1929 (NGVD29)

Modeling shows that the warmer and cooler hourly MOP temperature effects are negligible. The predicted MOP average hourly temperature (averaged over the period of interest) either varied by +/- 0.1° F or was unchanged compared to the temperatures for the normal operating range. Due to Oregon's proposed reservoir levels, in comparison to the normal operating range, the average number of days per year that exceeded the seven-day-average maximum[20] of 20.0° C (68.0° F)[21] was reduced by approximately one day at only two of the projects and increased by approximately one day at the other two projects. The maximum of the seven-day-average maximums for each project was either unchanged or increased by 0.1° F due to Oregon's proposed reservoir levels compared to the normal operating range over the 2011-2015 modeled period. Temperature effects would likely not be observable in temperature monitoring at the proposed reservoir levels since measurement error is approximately 0.3° C (0.5° F). Additionally, effects of the proposed reservoir levels are within the range of model uncertainty, which accounts for variability of other factors including flow, meteorology and the simplification of modeling hydraulics and heat.

The Corps' analysis demonstrated there would be minimal effect to water temperature and the Corps shared its analysis with Oregon. The Corps also asked whether EPA or ODEQ conducted any analysis on this condition, and the response from each agency was no. Thus, the only available water quality modeling demonstrates this condition will not have any measurable effect on water temperature related to water quality requirements. Therefore, EPA should not include this condition in the NPDES permits.

III. EPA's second question: Is it necessary for EPA to include any or all aspects of Oregon's example condition described above to meet Oregon's water quality requirements for temperature? If so, which aspects of the example condition are necessary to ensure compliance with Oregon's water quality requirements for temperature, and why?

As discussed in response to Question 1, it is not necessary for EPA to include any aspect of ODEQ's conditions to meet Oregon's temperature water quality requirements. These conditions are either already covered as part of Washington's certification or would have minimal effect to water temperature while having severe adverse impacts to other affected resources and congressionally-authorized purposes for the four lower Columbia dams.

Bonneville separated out the adverse effects analysis into eight sections: 1) Adverse Effects to Adequate, Efficient, Economical and Reliable Power Supply; 2) Adverse Effects to Transmission Reliability; 3) Adverse Effects to Greenhouse Gas Emissions; 4) Adverse Effects to Irrigation; 5) Adverse Effects to Fish; 6) Adverse Tribal Harvest Effects; 7) Adverse Effects to Hatcheries; and 8) Endangered Species Act Considerations.

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[20] OR. ADMIN. R. 340-041-0002(56) defines seven-day average maximum temperature as "means a calculation of the average of the daily maximum temperatures from seven consecutive days made on a rolling basis."
[21] OR. ADMIN. R. 340-041-0028(4)(d).

Bonneville has provided information related to adverse effects to tribal interests, including tribal harvest and effects to hatcheries. Bonneville's intent is not to speak for the Tribes adversely impacted by Oregon's proposed reservoir levels, but rather to flag these areas of potential effects so that EPA and Oregon can ensure adequate coordination has been completed prior to reaching a decision on Oregon's objection or any subsequent actions.

1. Adverse Effects to Adequate, Efficient, Economical and Reliable Power Supply

As discussed above, ODEQ's objection letter did not include specific requirements and timelines.[22] Thus, Bonneville staff referred to Oregon's request for lower Columbia River Minimum Operating Pool (MOP) elevation operations from Table 3 of the OR PI Motion.[23] The reservoir operating ranges requested are the lowest possible elevations within the authorized project operating limits and were used in the U.S. Army Corps of Engineer's water quality modeling.[24] Bonneville staff used the same lowest reservoir operating ranges to determine impacts to power generation and transmission. The impacts of the proposed change in reservoir elevations are distinguished between two periods because the effects are so different between summer, when the elevated water temperatures can occur and endangered species such as Snake River adult sockeye salmon and juvenile fall Chinook salmon are migrating, and spring, which is also a key period of salmonid migration, although elevated water temperatures are unlikely.

A. Power Effects during the Summer

Oregon's proposed reservoir levels at the lower Columbia River projects are below the normal minimum reservoir elevation with a one-foot operating range, which impacts fish facilities, navigation, water supply, tailwater constraints, and managing fluctuations on reservoir elevations from blowing wind. Tailwater refers to the water surface elevation at the base of the dam. Though the permits are for individual dams, the challenges of operating an interconnected system of dams require system-wide modeling to account for uncertainty from naturally occurring sources such as wind and streamflow as well as fluctuations in upstream regulation. The proposed reservoir levels will result in limiting the reservoir content to 20% of the normal operating content. This will cause the violation of established operating constraints (constraints to benefit fish and other congressionally authorized purposes) on the CRS in a multitude of conditions.

The easiest constraint to analyze is the impact on the ability to meet tailwater-change restrictions at Bonneville Dam, which are in place for human health and safety for downstream river users, such as fishing, recreation, and navigation.

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[22] r10-npdes-usace-lower-columbia-hydroelectric-facilities-odeq-cwa-objection-2021.pdf(epa.gov) 3: "during the period from July 15 to September 30, but also shall include analysis for other times of the year that are during key periods of salmonid migration. Such actions must include, but are not limited to, changes in operating pools during this period (limited by minimum operating pool)."

[23] See *supra* note 17.

[24] See *Corps Memo*.

Reservoir storage space on the lower Columbia River projects is used to manage streamflow uncertainty while meeting the Bonneville Dam tailwater constraints. As a result, the project can experience only a four-feet change in a 24-hour period and a maximum 1.5-feet change per hour.[25] To analyze how frequently the Bonneville tailwater constraints or the requested Minimum Operating Pool elevations may be violated, staff developed an hourly assessment utilizing actual historical streamflow data from 2011 to 2020 with the proposed minimum operating pool operations and the operations selected in the Columbia River System Operations Environmental Impact Statement (CRSO EIS) Record of Decision and consulted upon under the ESA (Proposed Action Operations) for comparison. The analysis showed that operating to levels identified in the OR PI Motion would result in frequent violations of the tailwater constraint below Bonneville or lower Columbia River Minimum Operating Pool ranges (or both during certain times). Limiting the projects to a one-foot operating range does not give the projects enough flexibility to adjust for outflow. The inflow into the lower Columbia River varies over the course of the day due to necessary changes in discharge from upstream non-Federal and Federal projects, and due to changes in natural, unregulated flows from tributary streams. Further, wind below Bonneville Dam and tidal influences also affect the tailwater elevation. Thus, if the projects do use storage to offset changes in inflow, the outflow would fluctuate as well, leading to fluctuations in the tailwater elevation and violations of tailwater operating constraints (Table 1).

Table 1: Probability of failing Bonneville Tailwater and Oregon's proposed reservoir levels compared to the Proposed Action Operations from July 15 – September 30:

Year	Probability of constraint failure Proposed Action	Probability of constraint failure Oregon's Proposed Reservoir Levels
2011	4.1%	40.9%
2012	3.4%	47.9%
2013	1.8%	14.9%
2014	5.5%	11.0%
2015	0.3%	11.0%
2016	0.3%	9.8%
2017	1.6%	6.3%
2018	2.2%	15.5%
2019	0.5%	11.4%
2020	0.7%	13.4%
Average	**2.0%**	**18.2%**

[25] For human health and safety for downstream river users, the tailwater elevation should not fluctuate more than four feet in a 24-hour period from April through September (five feet allowed 10 times a season, as authorized by the Bonneville Operations Project Manager) or 1.5 feet in an hour, per the Water Control Manual.

B. Power Effects during the Spring

As discussed for the summer effects, Oregon's proposed reservoir levels are below the normal minimum operating range with a one-foot operating range, impacting fish facilities, flood risk management, navigation, water supply, tailwater constraints, and managing wind fluctuations. The proposed reservoir levels will result in the violation of established operating constraints on the CRS in a multitude of conditions. Similar to the summer impact analysis, the easiest constraint to analyze is the ability to meet tailwater change restrictions at Bonneville Dam.

Under the Proposed Action Operations, the John Day reservoir is held to a two foot operating range, which greatly reduces its normal ability to store water for later power generation, particularly since natural wind events can push the water in the reservoir and swing the elevations up to 1.4 feet.[26] Thus, while the project officially has a two-feet operating range, power operations tend to use at most one foot of this range since natural fluctuations would otherwise frequently bring the reservoir out of the permitted range.

March 1 through June 15 is the most difficult time of the year to forecast Columbia River basin streamflows, since both precipitation events and air temperatures at any given day or hour can affect runoff timing and magnitude. Utilizing reservoir storage space on the lower Columbia River projects is required to manage that streamflow uncertainty while meeting the Bonneville Dam tailwater constraints (referenced above), which limit the project to a four-feet change in a 24-hour period and a maximum 1.5-feet change per hour. The same hourly assessment tool utilizing actual historical streamflow data from 2011 to 2020 was also used from March 1 – June 15 with Oregon's proposed reservoir levels and the Proposed Action operations for comparison. The analysis showed that operating to Oregon's proposed reservoir levels would result in frequent violations of the tailwater constraint below Bonneville and endangering human health and safety or Oregon's proposed reservoir levels (Table 2).

[26] At times the Columbia River Gorge will experience wind events where wind speeds exceed 25 miles per hour. For example, a wind event on March 28, 2021 where wind speeds increased over several hours from 0 to over 35 miles per hour. During the period of highest wind, the John Day elevation dropped 1.4 feet in 4 hours.

Table 2: Probability of failing Bonneville Dam tailwater constraints at Oregon's proposed reservoir levels compared to the Proposed Action operations from March 1 – June 15:

Year	Probability of constraint failure Proposed Action	Probability of constraint failure LCOL MOP
2011	2.0%	43.3%
2012	2.6%	39.0%
2013	1.1%	34.3%
2014	2.6%	18.2%
2015	1.3%	11.2%
2016	1.8%	20.1%
2017	0.0%	23.1%
2018	1.0%	24.1%
2019	0.8%	32.0%
2020	0.0%	29.4%
Average	**1.3%**	**27.5%**

Also, there are periods (usually coinciding with spring runoff in April/May/June) when river flows exceed the amount of generation flow to support Bonneville's firm power obligations and spill within the Oregon and Washington state water quality standards for total dissolved gas (TDG). In order to move the water through the CRS within the flood risk management requirements and other non-power constraints, the water can pass through the dams as generation, or spill through the dams, which increases TDG levels, a pollutant under the Clean Water Act and known to have effects on salmon, steelhead, and other aquatic species at certain levels.

In order to limit spill to keep TDG levels consistent with state water quality standards, Bonneville generates more power through the dams and sells any excess energy using the Western Electricity Coordinating Council (WECC) Day-ahead Market, the California Independent System Operator (CAISO) Market and the Real-time (within day) Market. Most of the western regional resource dispatch is determined on the Day-ahead Market making it the most viable source of additional load. The timing of the Day-ahead Market actually varies and can range from one to three days prior to the day of delivery on normal weeks and up to five days if there is a holiday. This lead time and the existing uncertainty associated with inflow (water supply) that the federal dams will be receiving already limits the ability of the federal system to fully utilize this opportunity to responsibly manage TDG. Variations in rainfall patterns, storage, and releases at both the five non-federal dams immediately upstream of the lower Columbia River projects and the Hells Canyon complex upstream of the lower Snake

River projects add uncertainty in federal project inflows. Additionally, the demand for federal power to serve Northwest load is largely weather dependent and operations planning depends on a forecast that has inherent error, especially days in advance.

The normal operating ranges provide lower Columbia River dams and reservoirs space to manage this streamflow and demand uncertainty and allows Bonneville to utilize the Day-ahead market more effectively. Oregon's proposed reservoir levels would remove the reservoir space needed to manage forecast uncertainty. The use of the Day-ahead Market, where most thermal resource dispatch decisions are made, would then be limited. If Bonneville cannot find a market for the hydropower generation, the water would have to be spilled, which could lead to exceedances of state water quality standards for TDG. Once the thermal resources are committed, uncertainty is met in the Real-time market, after the region had already made most of the resource planning and power trading. Once those limited Real-time markets are saturated, the available tools to move water become very limited and can result in the displacement of wind and solar and result in spill quantities exceeding state TDG water quality criteria.

Oregon and Washington allow water quality criteria modifications of the 110 percent total dissolved gas (TDG) criterion. During spring fish passage spill, occurring early-April to mid-June at the lower Columbia and lower Snake river dams, the TDG criterion is modified to 125 percent TDG in the tailrace.[27, 28, 29] The modified TDG criteria allow for increased spill for juvenile salmonid migration past the dams while still offering a degree of protection for fish from the risk of gas bubble trauma (GBT) due to exposure to elevated TDG. GBT occurs when gas bubbles form in the circulatory system. It is comparable to decompression sickness, or the bends, for scuba divers ascending too quickly. Salmonids with GBT are more susceptible to predation and, in severe cases, GBT can cause mortality.[30, 31]

At the same time, impacts from the spillway operations will likely lead to increased erosion and damage to the spillway aprons from the impact of spill on rocks that have settled at the base of the spillway aprons, leading to scouring of the apron surface. The resulting repair from this damage will lead to additional maintenance costs and, potentially, capital investments, all at a time when federal budgets are being constrained.

2. Adverse Effects to Transmission Reliability

A. Bonneville's Transmission System

[27] A tailrace is the area immediately downstream of the dam.
[28] Order Approving Modification to the Oregon's Water Quality Standard for Total Dissolved Gas in the Columbia River Mainstem, Environmental Quality Commission, 2020.
[29] WAC 173-201A-200(1)(f)(ii)(A).
[30] Mesa MG, & Warren JJ. 1997. Predator avoidance ability of juvenile Chinook salmon (*Oncorhynchus tshawytscha*) subjected to sublethal exposures of gas-supersaturated water. *Canadian Journal of Fisheries and Aquatic Sciences*, 54(4): 757-764.
[31] Mesa MG, Weiland LK, & Maule AG. 2000. Progression and severity of gas bubble trauma in juvenile salmonids. *Transactions of the American Fisheries Society*, 129(1): 174-185.

Bonneville owns and operates approximately 15,200 circuit miles of high voltage (115 kilovolt – 1000 kilovolt) transmission lines used to deliver power to loads in Bonneville's service area, which includes Oregon, Washington, Idaho, western Montana and small portions of California, eastern Montana, Nevada, Utah and Wyoming. By statute, Bonneville is responsible for ensuring the electrical stability and reliability of the Federal transmission system in the Pacific Northwest.[32] Bonneville's transmission system also interconnects with major transmission systems delivering power between the Pacific Northwest and California, Canada, Idaho, Montana and Nevada. Bonneville's transmission system is an integral component of the interconnected electrical system in the western United States (Western Interconnection). Preserving reliability and stability is therefore critical not only for the Pacific Northwest region, but also for the entire Western Interconnection.

B. Impacts of Oregon's Proposed Condition for an Initial Temperature Study

The lower Columbia River projects are a vital source of voltage support[33] and inertia,[34] and Bonneville heavily relies on these projects to maintain the reliability of the power system. The John Day and The Dalles projects are especially important for maintaining system reliability due to their specific locations within Bonneville's transmission grid, the power and voltage support capabilities of their generating units, and their overall size. Oregon's proposed reservoir levels and the associated constraints resulting from operations at those levels will reduce Bonneville's ability to utilize these projects to maintain reliable operation of the power system and will increase the potential for loss of load events (e.g., blackouts) which, in turn, poses increased risk to public health and safety.

1. Minimum Generation Levels

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[32] Federal Columbia River Transmission System Act, § 4(d), 16 U.S.C. § 838b(d) (2006).

[33] Voltage is required to push electricity from the power source through the transmission lines, and ultimately to the load. The lower Columbia River projects play a critical role in the reliable operation of a power system, as they are able to maintain their voltage even during major disturbances on the power system. This is the concept of voltage support. Without adequate voltage support, the power system could not reliably transfer power to the loads, especially if the power has to be moved over a long distance. Voltage support is also vital to keeping the power system stable if a large short-circuit or loss of transmission facilities were to occur. Without adequate voltage support, the risk of blackouts increases. Furthermore, voltage support has to be distributed throughout the system and cannot be concentrated in a few locations.

[34] Inertia is an inherent property of the rotating mass of generators, which acts as a "brake" on the interconnected transmission system. When there is a disturbance on the transmission system (e.g., loss of a transmission line), the interconnected transmission system reacts to that disturbance. With more inertia on the transmission system, the system reaction to a disturbance is smaller or more stable. When a generator is running, it converts the energy in the fuel source into electrical energy (e.g., flowing water through a hydro turbine). After a system disturbance, there may be a reduced ability to move the electrical energy across the system. Any energy that cannot flow across the system has the effect of speeding up the generator, which could cause significant damage to the generator. The more inertia on the system, the more energy it takes to change the speed of the generator, thus making the effect of a disturbance much smaller. This "braking" effect provided by the hydroelectric generators at the lower Columbia River projects helps to minimize the rate of change of the speed of both these generators and generators throughout the Western Interconnection.

Bonneville has established minimum generation levels at the four lower Columbia River projects in order to maintain reliability. Minimum generation levels set the minimum base level of generation needed to provide the voltage support and inertia required for reliable operation of the system. However, minimum generation levels assume normal operating conditions (all lines are in service), and do not provide for generating flexibility to respond to system contingencies. As a result, Bonneville cannot reliably operate the system at minimum generation levels at all times, as the system is rarely in a state of normal operating conditions.

Bonneville's Transmission Services group recently reevaluated these minimum generation levels. The analysis focused on the spring and summer, including during the time period identified in Oregon's *Initial Study of Temperature* condition.

Transmission Services' analysis showed the need for an additional generating unit to be placed online at both John Day and The Dalles projects for voltage and inertia support under more stressed operating conditions, such as when there are both high loads in the Northwest and high power transfers to California from suppliers in the Northwest and Canada. Other adverse conditions, such as major transmission outages could further increase the required number of generators that need to be online.

In addition, analysis performed by Bonneville's Power Services group showed that the reservoir elevations identified in the OR PI Motion would bring available generation at the lower Columbia River projects down to or very close to minimum generation levels for much of the summer season, depending on the type of water year. As stated previously, operating at or near minimum generation levels leaves little to no room at the projects to respond to system contingencies. Thus, Oregon's proposed condition to study changing reservoir elevations will increase the challenges of maintaining the reliability of the power system.

2. Coulee-Malin Phase Angle

The phase angle is a measurement of how offset the voltage waveforms at two different locations in the system are from each other. The larger the phase angle, the more vulnerable the power system is to instability following a major disturbance. The phase angle and associated instability risk can be reduced by decreasing loads or power transfers across the system, or by adding additional synchronous generators in between the two locations in order to increase the voltage support and inertia in that part of the system. Bonneville uses the phase angle between the Grand Coulee project in north-central Washington and the Malin Substation on the Oregon-California border near Klamath Falls, Oregon as a key instability metric (Coulee-Malin Phase Angle). Bonneville has determined that, under normal conditions, a Coulee – Malin phase angle of 58 degrees or more means that the power system is vulnerable to instability if a large short-circuit or loss of a major transmission line were to occur. However, Bonneville is required to take mitigating action far in advance of the phase angle reaching 58 degrees.

Transmission Services' analysis also showed that the Coulee – Malin phase angle could approach unacceptable levels with reduced generation at the lower Columbia projects under Oregon's proposed reservoir levels. This is the case even under normal system conditions. This condition could be mitigated by putting more generation on-line in the same areas where the lower Columbia River projects are located. While any generation, including wind, solar, or gas, could help with the phase angle to the extent that they are generating, Bonneville must be able to rely on the generation at the times when phase angle is high. Wind generation is intermittent and often produces at low levels during extreme temperature conditions, which can occur during the July 15 to September 30 time frame and also during the winter months, when a reliable power system is vital. Solar resources are also intermittent and are, of course, unavailable at night. Gas turbines could also be subject to natural gas disruptions, as happened to a number of gas turbines in western Washington and Oregon in March of 2019 when a gas pipeline disruption in Canada limited deliveries.[35] Further, state greenhouse gas policies will likely limit the long-term availability of gas turbines in north-central Oregon and south-central Washington. That leaves the power system dependent on reliable generation from the lower Columbia River projects for the foreseeable future. If generation cannot be increased at the lower Columbia River projects under the reservoir elevations identified in the OR PI Motion, then Bonneville would be required to either reduce transfers to California or cut loads in the Northwest (or possibly both) in order to bring the system back to a reliable operating state following an exceedance of the Coulee-Malin phase angle that results from the lower pool levels.

The Coulee-Malin phase angle issue described above can also impact the deliverability of generation from the upper Columbia projects, the Puget Sound Area, and Canada. Operating the lower Columbia River projects near or at minimum generation levels results not only in less generation available from those projects directly for service to load, but may also prevent the delivery of electrical energy from additional key resources in the northern part of the system to load. This risk to overall system resource adequacy is expected to increase as gas generation is retired and more intermittent renewable generation is integrated into the transmission system.

3. Gen Drop Remedial Action Schemes

Bonneville utilizes Gen Drop Remedial Action Schemes to maintain system reliability, and the generators installed at the lower Columbia River Projects are an essential part of that program. Gen Drop Remedial Action Schemes automatically take one or more generating units at the projects off-line instantaneously when outages of certain transmission equipment unexpectedly occur. Although on-line generation is generally needed for inertia and voltage support, there are some situations that require generation to be taken off-line very quickly in order to stabilize the system. However, this requires generation to be online and operating at certain levels in order for the Gen Drop Remedial Action Scheme to be effective. If there is inadequate generation available to implement Gen Drop Remedial Action Schemes, Bonneville must reduce the

[35] Although this is outside the July 15 to September 30 timeframe identified in Oregon's objection letter, given the vagueness of Oregon's objection letter, we note this impact because this time period could arguably meet the definition of "during times of key salmonid migration."

transfer capability of key transmission paths to California and within the Northwest. This negatively affects entities throughout the Western Interconnection. The hydroelectric generators installed at the lower Columbia River Projects are ideal for use in Gen Drop Remedial Action Schemes because they are less likely to be damaged when taken off line instantaneously due to their mass and slow rotational speed.

Oregon's proposed reservoir levels will also have an adverse impact on Bonneville's Gen Drop Remedial Action Schemes, which utilize John Day, The Dalles, and McNary. Under Oregon's proposed reservoir levels, the amount of Gen Drop these projects could provide would be significantly reduced because the projects will already be at or close to minimum generation levels. The less generation on line, the less Gen Drop will be available. If Bonneville could not carry the level of Gen Drop necessary at these projects, the only option would be to carry the Gen Drop at the Grand Coulee and Chief Joseph projects and possibly at other non-federal generation sites. However, Grand Coulee and Chief Joseph projects already carry a considerable amount of Gen Drop, so there is little room for additional Gen Drop at these projects. Moreover, the proposed spill operations will result in Bonneville carrying nearly all of its required operating reserves[36] at these same two projects. This could result in a significant amount of generation being dropped from the transmission system at the same time that the same projects are needed to increase generation to supply reserves.

Relying solely on the Grand Coulee and Chief Joseph projects to manage the reliability of the power system will significantly increase the risk of outages on the system. Thermal generators are less effective and more prone to damage from the sudden dropping of generation and take much longer to come back on line. Gen Drop has been installed at a number of renewable generation sites, but the intermittent nature of these resources means that they cannot be relied upon in all cases to supply the needed Gen Drop. Finally, performing Gen Drop actions at these alternative resources may not be as effective as Gen Drop at the lower Columbia River projects due to their location within the grid. Thus, Gen Drop may be less effective (thereby resulting in a reduced ability to transfer power across the power system), and it will take much longer to restore the power system to normal operating conditions if other resources are utilized for Gen Drop.

4. Operational Examples

A number of recent operating events illustrate how Oregon's proposed reservoir levels will adversely impact the operation of the power system. A recent example is the Northwest heat wave that occurred from June 26 – 28, 2021.[37] Temperatures and load levels in the Northwest

[36] Operating reserves are generating capacity that is used to respond to moment-by-moment shifts in load and to make up for other generation that unexpectedly goes off-line. The required amount of operating reserves that an entity like BPA must have available is governed by mandatory reliability standards from the North American Electric Reliability Corporation (NERC).

[37] Although this is outside the July 15 to September 30 timeframe identified in Oregon's objection letter, given the vagueness of Oregon's objection letter, we note this impact because this time period could arguably occur "during times of key salmonid migration."

reached unprecedented levels during this event. Fortunately, California was not experiencing a similar heat wave at the same time, so transfers to California were not as high as they would have been. The Coulee – Malin phase angle ranged from 20 degrees to 40 degrees. Generation at the lower Columbia River projects was over 2,500 MW.

A simulation of the generation patterns that could be expected from Oregon's proposed reservoir levels at the lower Columbia required a reduction of 1,500 MW at these projects, which was made up by increasing generation in Canada and at Grand Coulee. This generation shift resulted in an increase in the Coulee – Malin phase angle of nearly 5 degrees. While this would not have put the system up to the stability limit, it still indicates that this generation shift added a considerable degree of stress to the system. Had California experienced a similar heat wave at this same time, the consequences would have been much more severe. This is a risk any time during the summer, including during the time period identified in Oregon's *Initial Study of Temperature* condition.

The second example occurred from August 14 – 16, 2020, when the entire West Coast experienced a heat wave, resulting in high Northwest loads and transfers to California. At this time, there was over 2,000 MW of generation on the lower Columbia River projects. Even with generation from the lower Columbia River projects, the Coulee-Malin phase angle topped 50 degrees, getting close to the point where Bonneville would need to take action to reduce the phase angle. This, in part, limited the amount of transfers Bonneville could provide to California. Even with best efforts, California had to drop 1,000 MW of load (roughly equivalent to the load in the city limits of Seattle) for an hour on August 14 and another 470 MW of load for 20 minutes on August 15, 2020.

To evaluate how this event would have proceeded had the proposed operations in the OR PI motion been in place, Bonneville ran a simulation this event by setting the lower Columbia River projects to the proposed operations in the OR PI Motion. This shifted 1,025 MW of generation to Grand Coulee or resources in Canada. The simulations indicated that the Coulee – Malin phase angle would increase by 2 to 3.5 degrees due to this shift in generation, a definite increase in system stress putting the system much closer to its 58 degree stability limit and likely requiring Bonneville to take actions to reduce the phase angle. As previously noted, California have been required to drop load during the actual event. Had Oregon's proposed reservoir levels and the associated generation patterns been in place at the time, there is a strong possibility that California would be required to drop more load for a longer duration. This is a risk any time during the summer, including during the time period identified in Oregon's *Initial Study of Temperature* condition.

A third example further illustrates the importance of the lower Columbia projects during periods of high loads in the Northwest, especially if other resources are not available. From March 1 – 5, 2019, the Northwest experienced a late season cold snap and increased loads at the same time that most of the gas-fired generators in western Oregon and Washington went off-line due to gas

restrictions caused by a major pipeline disruption in Canada. There was considerable generation at the lower Columbia River projects at this time to make up for the lost generation.

Even though this event occurred in March, the system loads and generation patterns were largely the same as what would be expected in the winter due to the unusually low temperatures. Bonneville ran a simulation based on similar load and generation conditions, but with the lower Columbia River projects operating at the January levels proposed by Oregon, and with the Grand Coulee and Chief Joseph projects making up the lost generation. In addition, the simulation removes generation from the Centralia coal-fired plant in western Washington, which was online in March of 2019.[38] One of the two units at the plant was retired as of December 31, 2020 and the second unit is scheduled to be retired by 2025, so generation from Centralia will not be available in the future. This removes over 1,000 MW of generation and associated voltage support and inertia from the system in the area. Also, a recent injunction related to the Willamette projects will likely lower federal hydroelectric power generation at the Cougar, Lookout Point, Detroit, and Green Peter projects in the Willamette Valley to essentially zero through much of the late fall and winter period, and significantly limit it at other projects.[39] This eliminated approximately another 100 MW of generation from the FCRPS west of the Cascades in the simulation.

When all of these changes were modeled together, the simulation showed a considerable shift in the flow of power over the grid in the Northwest. The transmission corridor over the Cascades into western Washington, in particular, became very heavily loaded in the simulation. The simulation further indicated likely instability of the system if a major disturbance were to occur. In order to bring the system back to a reliable operating state, Bonneville would have been required to drop load in the Northwest, especially in the Seattle area. This example illustrates how generation loss at the lower Columbia River dams could lead to significant shifts in the way power flows within the electric grid of the Northwest. This could result in overloads of critical transmission paths, requiring reductions in load to bring the system back to a reliable operating state.

While this specific event occurred in the early spring, the Northwest is experiencing considerable growth in summer loads. Hence, this same scenario could easily occur any time of the year when the power system is experiencing peak loads should there be a similar interruption in gas supplies, including during the time period identified in Oregon's *Initial Study of Temperature* condition. Furthermore, in the long-term, given the likelihood that state greenhouse gas policies will result in permanent retirements of other fossil-fueled generators in western Oregon and Washington, this scenario of increased load with significantly reduced generation is likely to occur more often.

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[38] Although this is outside the July 15 to September 30 timeframe identified in Oregon's objection letter, given the vagueness of Oregon's objection letter, we note this impact because this time period could arguably occur "during times of key salmonid migration."

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5. Reserves Held by the Federal Power System

Moreover, Bonneville is required by law to operate the Federal Columbia River Transmission System, and is the Balancing Authority charged with the obligation to maintain balance between loads (demand) and resources (production) in its Balancing Authority Area. As a Balancing Authority, Bonneville is required to follow Reliability Standards adopted by the Federal Energy Regulatory Commission pursuant to Section 215 of the Federal Power Act, and also has obligations under its Tariff to provide reserves to customers. Bonneville relies on the generating flexibility of the FCRPS and either increases generation (*inc*) by releasing stored water through the turbines, or decreases generation (*dec*) by increasing spill or holding water back to avoid running through the turbines, in order to respond to differences in loads and resources to maintain balance. This flexibility is what constitutes reserves.

The CRS projects are operated as a coordinated water management system for numerous authorized congressionally authorized purposes in addition to power generation including flood risk management, navigation, fish and wildlife conservation, irrigation, water supply, and recreation. Because of these multiple purposes, the ability to fluctuate reservoir levels and thus generation levels, which is a necessary component of holding and deploying reserves to balance supply and demand, is already highly regulated and constrained. In other words, the ability to plan for and use reserve capacity at many projects is already quite limited. At upriver storage projects, water releases are affected by flood risk management operations, restrictive ramping rates, and summer flow augmentation to benefit ESA-listed species.

If Oregon's proposed reservoir levels are imposed and all four of the lower Snake River projects (as currently operated during spring and summer months) and four lower Columbia River projects (as proposed by the State of Oregon) are required to operate with a one-foot operating range during March 1 through June 15, *inc* reserves will be especially challenging to implement. The projects cannot increase generation if the reservoirs cannot utilize storage space to ensure water is available for releasing through the turbines when needed. Using the example of the 2020 operating year, *dec* reserves are especially challenging to implement when all four lower Snake River and four lower Columbia River projects are on minimum generation[40] and do not have the ability to decrease generation further in the event of an unexpected power system change.

The most significant operational impact for Bonneville if Oregon's proposed reservoir levels are imposed would be the limited ability to rely on the lower Columbia River projects for reserves. Typically Bonneville needs to carry approximately 1,400 MW of system reserves for *inc* and 825 MW of system reserves for *dec* in order to meet its obligations under Reliability Standards developed by the North American Electric Reliability Corporation (NERC) and approved by the Federal Energy Regulatory Commission pursuant to section 215 of the Federal Power Act.

[40] All lower Snake and lower Columbia River dams have a minimum generation requirement that has been established to support power system reliability.

These reserves are distributed among the 14 CRS projects according to their capabilities to provide flexibility under varying conditions. Under the Proposed Action Operations, the amount of reserves regularly held on the lower Columbia River projects ranges between 500 – 700 MW. Under Oregon's proposed reservoir levels, the ability to hold reserves will be significantly restricted. This would suggest that only Grand Coulee and Chief Joseph projects would carry most of the reserves, but these projects have restrictions that limit the ability to carry reserves as well. Therefore, Oregon's reservoir levels may make it impossible at certain times for Bonneville to hold the amount of reserves required by the NERC Reliability Standards.

Additionally, Oregon's proposed reservoir levels would discontinue Bonneville's ability to carry reserves at John Day Dam. The John Day Dam reservoir can have very significant bounces/changes in the forebay elevation as a result of naturally occurring sources, such as wind and streamflows, as well as fluctuations in upstream regulation. The project would have to be managed for regular adjustments in outflow in order to stay within these reservoir limits, leaving no reserve potential at John Day Dam for transmission reliability needs.[41] John Day Dam typically provides around 10% of Bonneville's required reserves.

McNary Dam outflows have a direct impact on the forebay downstream at John Day Dam. A reserve response[42] at McNary Dam would have to be quickly offset in the opposite direction of the response to balance the reservoir back to the middle of the requested forebay range to stay in a flexible position to respond to inflow uncertainty from the five non-federally owned projects directly upstream. This kind of flow swing would impact John Day Dam by creating a reservoir bounce (like a bathtub sloshing back and forth), which must be avoided if possible, especially during navigation events. In addition, offsetting McNary Dam in the subsequent period would typically require flexibility elsewhere to allow a generation shift for that purpose. Since the lower Columbia River projects have never been operated to the levels requested by Oregon, there is very little data on how the forebays would behave at the requested levels. Thus, a maximum flow change of 5 to 10 kcfs (25 to 50 MW) is a best professional estimate of what may be acceptable at McNary Dam.

Due to the extremely small pond behind The Dalles Dam, having only one foot operating range would be unreasonably constraining. In order to recover the forebay to Oregon's proposed reservoir levels with the one foot operating range after a reserve deployment, the project would have to ramp the generators an equal amount in the opposite direction of the deployment (double the initial direction). Doing so at The Dalles would have ramifications downstream at Bonneville Dam, causing that project to respond with an outflow movement in order to not fill or draft unduly, and doing so requires tailwater flexibility. However, as noted above, Bonneville Dam and reservoir project has a tailwater constraint limiting the project to a four-foot change in a 24-hour period and a maximum 1.5-feet change per hour during the spring and summer for

[41] Under the Proposed Action Operations, the John Day reservoir fluctuations are often over a foot; a two feet allowable range leaves only about one foot available for generation adjustment.
[42] A reserve response is when a project increases or decreases generation in order to respond to differences in loads and resources to maintain balance on the transmission system.

human health and safety of downstream river users such as fishing, recreation, and navigation. These constraints would limit The Dalles Dam to about a 10 kcfs flow change, which would limit a change in generation of 55 MW for reserves. These proposed operating constraints by Oregon are not reasonable for further consideration.

Natural fluctuations caused by tides, wind, and tributary streamflows impact the tailwater downstream of Bonneville Dam. With the tailwater and forebay constraints of the project, Bonneville would need to position Bonneville Dam in the middle range of allowable elevation to respond to upstream regulation and changes in streamflow forecasts and would not have flexibility to adopt further flow fluctuations, i.e. would not be able to respond to transmission reliability needs. A maximum of 5 kcfs (approximately 20 MW) may be acceptable at Bonneville Dam but depending on the situation would not be available all the time. All of these hydraulic constraints result in a maximum amount of capacity for transmission reliability obligations for all lower Columbia River projects at 100 MW, and even then this 100 MW would not be universally available between March 1 and June 15, which occurs during the peak of the spring salmon and steelhead downstream migration and at a time when Bonneville Dam is operating at high spill volumes of up to 125 percent TDG levels and minimum generation capabilities.

The resulting changes in generation to respond to the limitations above would be transferred to the Grand Coulee and Chief Joseph projects, constraining the use of those projects for within-hour reliability service in addition to the impacts discussed in the next section. They could result in spill at those projects leading to elevated TDG levels that could exceed the maximum water quality standards of 110 percent TDG levels and could impact salmon, steelhead, and other aquatic species. They could also result in inefficient, uneconomic sales and acquisitions and jeopardize the ability of the system to balance generation with expected load – particularly in stressed conditions such as heat waves and cold snaps. This could lead to human health and safety impacts as the demand for power increases.

Frequency bias response is the automatic movement of generators in response to frequency deviations from 60 Hz. Maintaining system frequency at 60 Hz is required for system stability and all units must provide frequency bias response. Based on Oregon's proposed reservoir levels, the entire 100 MW of capacity available for transmission reliability obligations on the lower Columbia projects would be used to respond to frequency deviations. Therefore, the operations would prevent Bonneville from holding or deploying contingency or balancing reserves on the lower Columbia River dams altogether. The lower Snake River dams already operate in a one-foot reservoir operating range, which consequently limits the ability of those projects to carry reserves. Without the ability to carry reserves on the eight lower Columbia and lower Snake River dams, Bonneville would need to rely on only two upriver projects in the Columbia River System (Grand Coulee and Chief Joseph), which would severely hamper Bonneville's ability to carry and deliver reserves. This could prevent Bonneville from meeting its NERC requirements and tariff obligations.

Grand Coulee and Chief Joseph projects often have limitations on their ability to carry reserves as well. For example, during high flow conditions when Grand Coulee is drafting for flood risk management or drum gate maintenance, generation that is decreased to hold *inc* reserves will directly result in spill at Grand Coulee and Chief Joseph dams and reservoir projects. When Grand Coulee is below the elevation where drum gates could be used for spilling water, spilling through the regulating outlets will increase TDG above the state water quality standards. Higher TDG levels can cause issues with net pen operations in the Chief Joseph Dam reservoir and managing TDG in downstream reservoirs. Increases in TDG levels can lead to indirect and direct mortality of fishes, in which the effects would vary depending on exposure levels and duration of time during exposure events.

6. Transmission Emergencies

Under the Proposed Action Operations, there are emergency protocols the Agencies implement when needed to maintain reliability and system stability. Oregon's proposed reservoir levels do not allow adequate time to identify and implement possible solutions to help protect the reliability of the integrated power and transmission system and pushes Bonneville closer to, and likely over the threshold, where deviations from planned fish passage spill operations and transmission system emergencies become more common. Bonneville staff work in coordination with peers from the other federal agencies as well as regional sovereign fish and wildlife managers through the Technical Management Team, to implement in-season adaptive management actions – including minor changes in fish passage spill implementation – to avoid the larger system problems that might create the need for use of the transmission emergency protocols. However, Oregon's proposed reservoir levels put the system closer to a level of relying on emergency actions at a frequency or magnitude that is not prudent.

Emergency actions are not intended to be used routinely as a management tool. Deviations from Proposed Action Operations for fish passage are only implemented as a last resort, but that flexibility to implement short-term adjustments is nevertheless a critical tool, as it provides Bonneville with the ability to respond quickly to disturbances on the transmission system and therefore helps reduce the risk of far more significant transmission problems that could result in human health and safety impacts.

The flexibility to manage the transmission system for electric reliability is necessary to minimize the risk of uncontrolled disturbances on the transmission system that could result in rapid, automatic changes in generation at many projects that would cause more severe and frequent interruptions in planned spill for fish passage, as well as potential blackouts resulting in human health and safety concerns. With only Grand Coulee and Chief Joseph projects available for reserves, which would be the case under the reservoir elevation changes proposed by Oregon, there will likely be an increase in the number of power and transmission system emergencies declared in order to access generation on the four lower Snake River and four lower Columbia River projects. Bonneville does not, however, believe it to be prudent to plan to be in emergency conditions. Having only two projects with available flexibility does not provide sufficient flexibility, enough redundancy or geographic diversity for the size of the balancing area managed

by Bonneville to provide reliable power. Both of these projects also require regular system maintenance, which would sometimes leave only one project available for the reliability of the entire balancing area.

Operating in this manner will undoubtedly have adverse effects to planned fish spill operations. First, declaring an emergency in order to access generation on the fish passage projects on the lower Columbia and Snake rivers will interrupt the fish passage operations more frequently. This is because quick generation increases can only be met with stored water and, with the reduced lower Columbia River reservoir storage capacity, the effects could more frequently spread to the lower Snake River projects. Specifically, if large increases in generation are needed, interruptions in fish passage operations at the lower Snake River projects could result. Second, with less storage capacity available in the lower Columbia River projects to minimize inflow fluctuations during volatile, spring streamflows, there will be more extreme increases and decreases of flows. This means the lower Columbia flows will dramatically exceed and undershoot planned fish passage spill operations to stay within non-power constraints (operational constraints to benefit fish and other congressionally authorized purposes). Reducing spill at any project during the spring and summer spill operations will put juvenile salmon and steelhead at risk of passing at higher proportions through the powerhouses, a route that typically results in lower direct and indirect survival rates.[43]

Oregon does not address the potential for impacts on system reliability from the requested reservoir operating constraints in Oregon's objection letter.[44] Managing the integrated federal power and transmission system necessitates understanding the impacts, including the most extreme risk scenarios, and planning accordingly to minimize risks to the operational reliability of the regional power grid, and ultimately, to human health and safety. Under Section 215 of the Federal Power Act, Bonneville will take those actions necessary to protect electrical reliability and human health and safety. Under current operations, a transmission system emergency should be a rare occurrence and only in response to unique situations, but under Oregon's proposed reservoir levels, Bonneville does not have the ability to respond to system conditions to avoid an emergency as it does under the Proposed Action Operations. Bonneville's transmission operators need generation flexibility to manage transmission constraints proactively to maintain grid reliability in order to avoid the need to declare transmission system emergencies. Thus, the reservoir levels in the OR PI Motion at the lower Columbia River projects would increase the frequency with which these projects operate at minimum generation levels, especially during low water conditions. This, in turn, would increase the stress on the transmission system, particularly during periods of high loading and high transfers. This

[43] Skalski, J. R., S. L. Whitlock, R. L. Townsend, R. A. Harnish. 2021. *Passage and Survival of Juvenile Salmonid*

Management. Vol 41:3, pp 678-696. Available from: https://doi.org/10.1002/nafm.10572

[44] Oregon's proposed supplemental condition for the *Initial Study of Temperature* does request the Corps to evaluate "operational tradeoffs from lowering operating pools and whether such changes would significantly affect other goals." It is unclear to Bonneville what "goals" Oregon is referring to, but if the intent was to include power and system reliability, Bonneville's analysis demonstrates the adverse effects to power and transmission reliability, and thus, human health and safety, outweigh any minimal effects to water temperature.

increased system stress would then make it more likely that service to loads in the Northwest would have to be interrupted or transfers to California would have to be reduced (which, in turn could lead to interruption of California load) in order to maintain system reliability. In addition, other changes in the regional generation mix will make dependable generation from the FCRPS even more important.

Finally, climate change will make conditions of high loads, high transfers, and system contingencies more frequent. Over the past several years, Bonneville has seen an increase in heatwaves, fires, and storms throughout the West. The increase in the number of these events has contributed to increased loads and a greater likelihood of equipment outages on the transmission system. Furthermore, climate change will make these types of events more frequent and intense as time goes on. This will both contribute to increased loads and increase the likelihood that transmission facilities will be lost due to system disturbances. If the generating capability of the lower Columbia River projects is reduced to the extent proposed by Oregon, the risk of major outages during times when power is necessary for human health and safety will increase significantly. Thus, not only does Oregon's *Initial Study of Temperature* condition have minimal effects to water temperature, it would have detrimental effects to transmission reliability.

3. Adverse Effects to Greenhouse Gas Emissions

Finally, the implications to societal efforts to reduce reliance on fossil fuel resources from the loss of hydropower generation and flexibility associated with Oregon's proposed reservoir levels will be greater than just the lost megawatts of production from the CRS. The CRS is a source of flexible generating capacity not reliant on fuel that emits carbon. Such sources are important as states and the nation seek to achieve and even eliminate carbon emissions from electricity production by introducing other carbon free resources that are variable in nature, such as wind and solar, in high concentration. These variable renewable resources pair well with the flexible, carbon-free generation from the CRS because it can smooth out the generation from wind and solar. The CRS enables these resources to come online sooner and without the need for fossil fuel resources to provide these valuable integration services. The loss of flexible capability due to Oregon's proposed reservoir levels would both delay and increase the cost of states and the nation achieving carbon reductions goals as the region will need additional investment and time for technological advancement to offset the loss from the CRS. There was insufficient time to quantify these impacts for these comments, however, regions without the advantage of flexible hydro generation offer insight into the challenges.

The value of the flexibility of hydropower generation is identified in the CRSO EIS in two different contexts. For the Multiple Objective (MO) Alternatives that require replacement resources, particularly MO1 and MO4, the capacity of replacement resources needed to replace the loss of flexible hydropower generation is higher than the average generation loss from hydropower, even when the replacement resources are natural gas resources that are not inherently variable and can provide flexible generation. Furthermore, the discussion about the Lower Snake River Full Replacement beginning on page 3-944 of the CRSO EIS for MO3

highlights the value of the flexibility in the hydropower and the challenges of using wind, solar, and batteries to replace hydropower.

4. Adverse Effects to Irrigation

Irrigation pumping has been established at specific levels in both the McNary and John Day reservoir. The U.S. Army Corps of Engineers completed a drawdown study in 1994 to determine impacts to irrigators as a result of lower reservoir elevations.[45] The results of this study were used to establish elevations appropriate for irrigation and to design irrigation pumps and fish screens. These modifications were funded with millions of dollars of private investments and additional investments would need to be made in order to modify this infrastructure, if possible, to accommodate Oregon's proposed reservoir levels.

5. Adverse Effects to Fish

A. Non-operational fish ladders

While Oregon's proposed *Initial Study of Temperature* condition will have negligible impacts to water quality (see BPA's response to Question 2 above), there will be adverse effects to lower Columbia River project operations that have been developed over decades to benefit migrating fish. Historical conversion rates, or fish passage success of adults migrating upstream from project to project on the lower Columbia River (e.g., The Dalles Dam to John Day Dam), range from 86 to 98 percent.[46] Oregon has proposed its condition without having evaluated whether its proposed changes to reservoir levels would positively affect these conversion rates; or if the proposed changes would dewater entrances and exits of ladders, compromise adult salmon and steelhead passage, and increase water temperature within the fish ladders. Additionally, the vagueness of Oregon's proposal presents further issues regarding whether structural modifications at the lower Columbia River projects would be necessary or feasible to ameliorate the adverse effects from Oregon's proposal. The unnecessary delay of adults at any project, for any duration, along with metabolic losses during such a transition would impose additional negative impacts to fish passage operations that have been developed, evaluated, refined and successfully prescribed over several decades to provide the best passage success for multiple species.

At each of the four projects on the lower Columbia River, the Corps operates fish passage facilities to provide safe routes of passage for fish to migrate upstream by fish ladder or downstream through spillway gates, surface passage structures and bypass systems. These facilities are used by both juvenile and adult fish, such as salmon, steelhead, lamprey and bull

[45] See decision from *Salmon Summit* (April 1994) and outlined in *Columbia River Salmon Mitigation Analysis System Configuration Study, Phase I: Appendix B. John Day Reservoir Minimum Operating Pool Technical Report.* Prepared for Northwest Power Planning Council, Columbia River Fish and Wildlife Program.
[46] See University of Washington, Columbia Basin Research Data in Real Time (DART) website for historical conversion rates by species, river reaches and dam to dam.

trout. Operating the lower Columbia River project fish ladders at Oregon's proposed reservoir levels will negatively impact the functionality of the fish passage systems. The specific impact of the resulting modification of fish ladder flows and adverse impacts to conditions at the entrances and exits will differ project to project, but will likely deteriorate, if not stop, adult fish passage in the lower Columbia River.

At Oregon's proposed reservoir levels, all four lower Columbia River projects will be forced to use the auxiliary water supply (AWS) systems to provide water at the maximum design limits, for extended periods of time and with the greatest needs during low to moderate flows. Operating the fish ladders in this manner, with less water going into the ladders from the forebay (the area immediately upstream of the dam) and supplemental flow from the AWS, will pose a risk to successful fish passage by creating adverse hydraulic conditions and flow patterns. Fish ladder hydraulics have been studied and modified over many decades to maximize fish passage.[47] Oregon's proposed reservoir level changes have not been evaluated for their impacts to fish ladder hydraulics, and these changes are expected to result in inferior passage conditions for adult salmonids.

Adult salmonids are attracted to the fish ladder entrances in the tailrace by "attraction flows", which are plumes of water coming out of the fish ladder, indicating the location of the entrance. At Oregon's proposed reservoir levels, the depth of water at the entrances will be reduced below the optimal fish passage criteria identified in the Fish Passage Plan.[48] The effect will be that less water will exit the ladder in the tailrace of a project (the area immediately downstream of the dam), resulting in a reduction of the effectiveness of the plume of water coming out of the ladder to attract fish to the entrance. When adequate attraction flow is not available, migratory fish are unable to find the entrance of a ladder and their migration can be delayed.

While delays to migration at any of the four lower Columbia River projects is never good for any species, additional delays at Bonneville Dam for example, which passes all migratory fish such as salmon, steelhead, and lamprey that originated upstream and throughout the Columbia River Basin, would likely increase the number of fish eaten by sea lion predators. At the entrances of the fish ladders at Bonneville Dam, the magnitude of sea lion predation in this location has increased in recent years. Sea lion predation events of a smaller magnitude also occur in the tailrace of The Dalles Dam and could increase under these operations. The increase in sea lion predation as a result of Oregon's proposed reservoir levels seems short sighted given Oregon Department of Fish and Wildlife's involvement in addressing sea lion predation on the lower Columbia River in recent years.

Just as fish ladder entrance depth and conditions would be negatively impacted by Oregon's proposed reservoir levels in the tailrace areas of all four projects, so would fish ladder exits into the upstream reservoirs. As fish complete fish ladder passage and prepare to go into the

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[47] Criteria for maintaining adult and juvenile fish passage facilities are documented in the Corps' annual Fish Passage Plan.
[48] *Id.*

reservoir, they will be required to swim through a shallower exit as a result of Oregon's proposed reservoir levels. Again, this could be a source of delay as fish often hesitate prior to swimming into areas of restricted size. The depth of water outside of the ladder may also present risks to adult fish. For example, Oregon's proposed reservoir levels at Bonneville Dam would result in shallow depths in the fish ladder exits and likely associated growth of aquatic vegetation that will cause fish to struggle to navigate out of the fish ladder exit areas.

In addition to the delay issues identified above, Oregon's proposed reservoir levels will likely result in elevated temperatures in the fish ladders and a reduction in differentials in water temperature that are imperative for successful fish passage. Oregon's proposed reservoir levels will result in shallower, warmer water flowing into the fish ladders, replacing the current cooler water that flows into the fish ladders at depth thus contributing to delays in adult passage With the forebay at a lower elevation, it will increase the water temperature in the fish ladders as more of the water flowing into the ladder will be coming off the surface, which is warmer than water at deeper elevations. Elevated temperatures in the fish ladders will likely result in further passage delays in addition to those identified above. In addition to travel time delays, warmer water temperatures in the fish ladders will have adverse effects to fish health by increasing stress, which can lead to increased mortality events.[49] During such physiological disturbances, migratory species become susceptible to immunosuppression and vulnerable to disease that can lead to increased mortalities.[50, 51]

Additionally, Oregon's proposed reservoir levels are only one of *many* confounding factors that would impact fish passage at the projects. The operation of spillways and powerhouses and the prioritization of specific bays or units can either improve or degrade passage conditions. For example, at Bonneville Dam Powerhouse 2, the surface corner collector (B2CC) passes an estimated 5,000 cubic feet per second (cfs) and is paired in operation with the adjacent turbine unit 11 to maximize fish guidance efficiency (FGE), which draws more fish towards and into B2CC. The B2CC passage route has a historic survival rate of approximately 97 to 99 percent, the highest route of survival at Bonneville Dam.[52] At Oregon's proposed reservoir levels, the flows at the B2CC will be reduced by an estimated 20%, resulting in greatly reduced proportions of juvenile spring and summer migrants passing through the B2CC. Redirected flow and migrants that would have otherwise passed through the B2CC will instead pass at higher proportions through Bonneville Dam Powerhouse Two, which is estimated to result in four to five percent lower direct passage survival rates (estimated at 93 to 94 percent). Fish that pass through turbine units have historically lower survival rates. Reductions in passage rates through

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[49] *See* Jeffries, K.M., and others. 2014. *Transcriptomic responses to high water temperature in two species of Pacific salmon.* Evolutionary Applications. 7(2): 286-300.
[50] *See* Jeffries, K.M., and others. 2012. *Consequences of high water temperatures and premature mortality on the transcriptome and blood physiology of wild adult sockeye salmon (Oncorhyncus nerka).* Ecology and Evolution. 2(7): 1747-1764.
[51] *See* Miller, K.M, and others. 2009. *Salmon spawning migration: Metabolic shifts and environmental triggers.* Comparative Biochemistry and Physiology Part D: Genomics and Proteomics. 4(2): 75-89.
[52] *See* Ploskey et al. 2012 and Ploskey et al. 2013 (Final Reports by Battelle, PNNL No. 20095 and 22178, respectively).

the B2CC is likely to result in reduced juvenile survival, which in turn may result in lower numbers of returning adults.

Similar to the concerns regarding negative impacts to fish passage at Bonneville Dam B2CC as a result of Oregon's proposed reservoir levels, impacts to the operation of the Ice and Trash Sluiceway (ITS) at Bonneville Dam Powerhouse One would also occur. Oregon's proposed reservoir levels will reduce flow rates through the Bonneville Dam ITS, attract fewer juvenile fish that typically survival and if Powerhouse One is operating, it will also increase powerhouse passage at that location. The Bonneville Dam ITS may even be rendered inoperable at Oregon's proposed reservoir levels, leaving all juveniles in the Powerhouse One forebay to pass through turbine units. By increasing the number of juveniles passing through the powerhouses at Bonneville Dam, overall indirect survival will be lower compared to the current operation that is intended to aid in juvenile fish survival and smolt to adult return ratios (SARs).[53]

BPA anticipates decreases in fish passage guidance efficiencies to also occur at other projects under Oregon's proposed reservoir levels. For example, fish passage guidance at The Dalles Ice and Trash Sluiceway (TDA ITS) will likely be reduced, similar to Bonneville Dam ITS, and result in elevated proportions of fish passing through the powerhouse. The exact amount of flow reduction is dependent upon the location and the number of open gates. Studies from 2010-2011 observed downstream fish passage survival for spring and summer juvenile migrants to range from 98 to 100 percent through the TDA ITS, but only 86 to 92 percent through the powerhouse via turbines.[54] Based on this information, we know that decreases in direct survival of juvenile downstream migrants, and associated impacts to adult returns, are likely to occur at Oregon's proposed reservoir elevations.

B. The Dalles spillwall effectiveness

To improve juvenile fish egress conditions in the tailrace of The Dalles Dam, a wall was constructed in 2010 (hereafter referred to as "the spillwall"). Prior to the spillwall construction at the junction of spillbay gates 8 and 9, juvenile salmon and steelhead that passed through the spillway would be entrained in shallow areas directly downstream, where they were subject to increased predation rates of piscivorous fish (e.g., Northern pikeminnow and smallmouth bass) and birds (e.g., California gulls, ring-billed gulls and Caspian terns). The spillwall directs juveniles into the main river channel, speeding their migration downstream and minimizing predation risk. The spillwall structure at The Dalles Dam was designed assuming current forebay and tailwater elevations and cannot operate when the Bonneville Dam forebay elevation is below 72 feet. Spill for juvenile fish passage is generally limited to bays 1-8 at The Dalles Dam to take advantage of improved egress conditions under the current fish passage spill operations.

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[53] *See* Haeseker, S.L., and others. 2012. *Assessing freshwater and marine environmental influences on life-stage-specific survival rates of Snake River spring-summer Chinook salmon and steelhead.* Transactions of the American Fisheries Society. 141:121-138.

[54] *See* Johnson et al. 2011 and Ploskey et al. 2012 (Final Reports by Battelle, PNNL No. 20626 and 21124, respectively).

Given these constraints, the lower forebay elevation associated with Oregon's proposed reservoir levels downstream of The Dalles Dam (e.g., Bonneville Dam reservoir elevation below 72 feet) would create tailwater conditions over the spillway shelf that would be insufficient for fish passage. Oregon's proposed reservoir elevations would create high velocities, over 20 feet per second (fps), in the tailwater of The Dalles Dam spillway area, which are outside the design criteria for the facility and could lead to a structural failure of the spillwall.[55] In order to implement Oregon's proposed reservoir levels while also meeting the 40% fish passage spill levels during spring spill operations and maintaining safe velocities for the spillwall structure, a limited amount of spill would be released through the preferential bays 1-8 (north of the spillwall) and the remainder of spill would be released outside the spillwall. The spillbays outside of the spillwall have historically poorer juvenile egress conditions for spring and summer migrants. Corps staff estimates that with the Bonneville forebay elevation below 72 feet, the proportion of juvenile fish passing south of the spillwall will increase by a minimum of 10% and will be directed into shallow islands immediately downstream of the spillway where they are heavily preyed on by predatory fish and birds.[56]

C. Surface Spill Impacts

Negative impacts of Oregon's proposed reservoir levels to juvenile and adult salmonid and steelhead surface spill routes will be pronounced at John Day and McNary dams. Significant reductions in FGE will occur at John Day and McNary dams if operated at Oregon's proposed reservoir levels. At John Day Dam, the flow at Top-spill Surface Weirs (TSW) will be decreased by at least half and potentially up to 60%, compared to spill levels at current forebay operations. The average flow at each of the TSWs during spring and summer spill conditions is 10,000 cfs, but under Oregon's proposed reservoir levels, it would be an estimated 4,200 cfs. This reduction in flow will result in two negative impacts to ESA-listed salmon and steelhead. First, fewer fish will be guided to and passed via the TSWs, the route of highest survival at the project. Second, ESA-listed adult salmon and steelhead that overshoot or post-spawn steelhead, (otherwise known as kelts that are returning to the ocean and will return as a repeat spawner), which pass downstream through the TSWs, are much more likely to incur injuries and higher direct and indirect mortality rates at these lower flows. Oregon's proposed reservoir levels would result in similar adverse effects at McNary Dam where two TSWs operate through the spring spill operations and early summer operations.

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[55] *See* Final Army Corps of Engineers Portland District Design Documentation Report No. 35: *The Dalles Lock and Dam Bay 8/9 Spillwall, Columbia River, Oregon-Washington* (May 2013).

[56] *See* Ebner personal communication on Surface Collector Rating Tables from Army Corps of Engineers Portland District. August 1, 2021.

D. Increased Avian Predation and impacts to operations that are intended to address predation

Oregon's proposed reservoir levels will also have an impact on the effectiveness of the avian lines that are installed in the tailraces of the four lower Columbia River projects to provide juvenile salmon and steelhead protection from avian predators. These avian lines are intended to dissuade avian predators from predating on juvenile salmonids in the tailrace of the dams. At Oregon's proposed reservoir levels, we expect the distance between the lines from the surface of the water to increase. The lines were installed at a specified distance from the water that was meant to deter avian predation in the most effective manner. Oregon did not provide any analysis of how a change in this distance as a result of its proposed reservoir levels, but it is reasonable to believe that added space between the lines would allow more birds to fly under the lines and result in an increase of avian predation on juvenile salmonids.

Changing reservoir levels at the four lower Columbia River projects would also impact other efforts to reduce avian predation on ESA-listed fish. At some reservoirs, operating at Oregon's proposed reservoir levels will provide an increase in habitat that includes favorable nesting conditions for waterbirds to establish new nesting colonies. Additional nesting colonies on the mainstem of the lower Columbia River will increase the predation rates of ESA-listed juvenile salmon and steelhead during the spring and summer downstream migrations. Historically, predation rates have been recorded at significant levels in the Columbia River Plateau region (e.g., upstream of Bonneville Dam). In fact, new spring operations were implemented in 2021 to maintain the reservoir between John Day and McNary dams at a higher range in elevation to inundate nesting habitat in the Blalock Island Complex, deter Caspian terns from nesting in this area, and reduce avian predation rates on spring migrations. [57] The increase in reservoir elevation at John Day is temporary (April 10 – June 1). These operations would not be available under Oregon's proposed elevation levels.

During the spring downstream migrations, Caspian tern predation rates at nesting colonies within the Blalock Island Complex have been as high as 2.3% (1.2–4.1%), 8.0% (6.0–11.4%), and 8.2% (5.9–12.4%) on Snake River (SR) sockeye, SR steelhead, and upper Columbia River steelhead, respectively. ESA-listed species benefit from reduced avian predation as they migrate through the lower Columbia River under current operations. Although the increased reservoir elevation of the John Day reservoir is expected to decrease travel rates and increase vulnerability to predation by piscivorous fish, survival of juvenile SR sockeye salmon, SR steelhead, and upper Columbia River steelhead is expected to increase by a minimum of 2%, 5%, and 1%, respectively. [58] An increase in nesting habitat due to Oregon's proposed reservoir levels would

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[57] *See* Action Agencies proposed action in the 2020 Biological Assessment: BPA (Bonneville Power Administration), USBR (U.S. Bureau of Reclamation), and USACE (U.S. Army Corps of Engineers). 2020. *Biological Assessment of Effects of the Operations and Maintenance of the Federal Columbia River System on ESA-Listed Species.* Bonneville Power Administration, Portland, Oregon.

[58] *See* Evans, A.F., Q. Payton, B. Cramer, K. Collis, N.J. Hostetter, and D.R. Roby. 2019. *System-wide effects of Avian Predation on the Survival of Upper Columbia River steelhead: implications for predator management.* Final

add foraging pressure on spring *and* summer downstream migrants, including subyearling Chinook salmon that typically migrate downstream during the months of June and July. Oregon's proposed reservoir levels would counteract these operations, thus increasing avian predation on ESA-listed species.

E. Habitat impacts

For decades the range of operation of the lower Columbia River reservoirs have been consistent. The John Day Dam reservoir has been limited to a 1.5 to 2 foot range for most of the past 30 years during the fish migration season. The McNary Dam reservoir has been held in the top three feet of its operation range. Because of these restrictions, hundreds of miles of plant communities have been established based on this water being available during the growing season. By lowering the elevation as requested by Oregon by two to five feet below historical levels, many of these plants will perish. The wildlife refuges where these plants are established provide habitat for millions of migratory birds at various times of the year.

6. Adverse Tribal Harvest Effects

The river conditions created by Oregon's proposed reservoir levels will negatively impact tribal fishing in Zone 6.[59] Tribal gillnetting is dependent on stable reservoir elevations. As discussed in the Adverse Effects to Adequate, Efficient, Economical and Reliable Power Supply section above[60], Oregon's proposed reservoir levels will result in more extreme increases and decreases of flows through the lower Columbia River, thereby impacting the ability to maintain stable reservoir elevations. There are annual requests submitted to the Corps' Reservoir Control Center by several tribes, including the Confederated Tribes of the Umatilla Reservation, the Yakama Nation, the Warm Springs Tribe and the Nez Perce Tribe to request hard and soft constraints on forebay fluctuations. Large fluctuations can result in damage to equipment (nets), lower harvest success, impacts to fish passage, and fish wastage as fish-laden nets that are displaced during flow fluctuations are often not recovered. As the forebay fluctuates significantly, the nets are either made slack with a low pool (poor harvest conditions) or potentially displaced to float downstream with a high pool. The nets that get displaced are problematic on multiple fronts. First, the nets may float into other tribal members' nets. Second, the nets may dislodge while full of fish which causes wastage of those fish that were entrained in the net. These floating nets also are a hazard to other adult migrating fish. Third, the nets may end up on one of the dam's trashracks as they float downstream and this would likely occur more frequently with fluctuating forebays. If these nets get pulled into a fish ladder exit, they have the ability to completely stop adult passage through that ladder. They are also often difficult to notice if they are at depth.

Report submitted Grant County Public Utility District and the Priest Rapids Coordinating Committee, Ephrata, Washington.

[59] Zone 6 is an area designated for tribal fishing extending from Bonneville Dam to McNary Dam. https://critfc.org/about-us/columbia-river-zone-6/

[60] See pages 8-9.

7. Adverse Hatchery Effects

The Umatilla Hatchery sits adjacent to the mainstem John Day Reservoir on the Oregon side. The hatchery is operated by the Oregon Department of Fish and Wildlife (ODFW) in cooperation with the Confederated Tribes of the Umatilla Indian Reservation. BPA funded the construction and currently funds the operations and maintenance of the facility.

The Umatilla Hatchery's water supply is provided by a series of five wells including a ranney well located near the edge of the river. A ranney well is a well that is sourced from surface water. The ranney well provides the majority of the water supply to the Umatilla Hatchery and acts more like a sump receiving water from the lower Columbia River through the filtration of the sand bank. The Umatilla Hatchery has substantial existing water quantity issues with all wells. The ranney well production is correlated with elevation levels of the McNary tailrace. McNary tailrace elevation levels of 265 feet or higher is ideal, while elevation levels that are below 263 feet will impact well production negatively. Oregon's proposed reservoir level at the John Day reservoir (and therefore at the McNary tailrace) is 257 feet, which is well below the reservoir elevations that are known to negatively impact the water supply to the Umatilla Hatchery. In the summer months, the Umatilla Hatchery raises spring Mid-Columbia Chinook and Mid-Columbia steelhead, an ESA-listed species. In the fall months, the Umatilla Hatchery raises sub-yearling Snake River fall Chinook, also ESA-listed, for release during the following winter and spring. During the marking program in July, the water demand at the hatchery increases. Oregon's proposed reservoir levels may compromise the water quantity needs at the hatcheries operated by one of their own departments.

8. Endangered Species Act Considerations

Bonneville would also like to provide comment on consultation under the Endangered Species Act (ESA) for the actions proposed in Oregon's Objection Letter. If Oregon's proposed elevation levels are included as a requirement in the NPDES permits, then there are a couple of issues that will arise related to ESA consultation.

Therefore, if EPA includes Oregon's proposed reservoir levels as a permit condition, EPA would need to define the proposed permit condition with enough specificity so that the Services can conduct an analysis of the effects of that condition on ESA-listed species. 50 C.F.R. § 402.14(c). Since Oregon's proposed condition is so vague and does not include any specificity of the proposed reservoir levels that would be incorporated into a permit condition, the requisite specificity necessary for ESA consultation will be difficult to attain.

We further note that the Services did not consult on operations at Oregon's proposed reservoir levels as part of the consultation on operation and maintenance of the dams that make up the CRS. The Action Agencies memorialized their decision to implement that proposed action in addition to the terms and conditions included in the Services' biological opinions resulting from

that consultation in the CRSO EIS Record of Decision. The proposed action consulted upon in those biological opinions describes the operation of the reservoirs, including elevations, of the four lower Columbia River dams. Both of the Services evaluated the impact of those operations on the species listed under the Endangered Species Act for which they have jurisdiction and concluded that those operations, along with the rest of the proposed action, are not likely to jeopardize the continued existence of those ESA-listed species or destroy or adversely modify designated critical habitat. The description of the operation of the reservoirs of the four lower Columbia River dams in the proposed action does not include Oregon's proposal of reducing the elevation of the reservoirs to a "minimum operating pool."

IV. EPA's third question: As an alternative to Oregon's example condition, what permit conditions would ensure that Oregon's water quality requirements for temperature are met?

As discussed in Bonneville's responses to EPA's Questions 1 and 2, Washington's certification includes a condition that requires the Corps to "implement temperature control strategies and meet the load allocations in the Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load." Thus, Washington's certification already includes a condition that would ensure compliance with Oregon's temperature water quality requirements.

V. EPA's fourth question: Are there other conditions EPA should consider in the draft permits to meet Oregon's water quality requirements for temperature?

As discussed in Bonneville's responses to EPA's Questions 1, 2 and 3, Washington's certification includes the conditions that will meet Oregon's water quality requirements for temperature Thus, EPA should not consider any other conditions for the draft NPDES permits.

VI. BPA's comments on EPA's recommendation from the June 7, 2022 hearing

EPA provided its recommendation that conditions provided in Washington's 401 certification should be modified to require the Corps to develop a plan that will meet both Washington's and Oregon's water quality standards for temperature, and also require that Ecology and ODEQ review and approve this plan, with ODEQ's approval limited to three specific areas. EPA based its recommendation on three specific differences in the water quality standards between Oregon and Washington outlined in the *EPA Region 10 401(a)(2) Evaluation and Recommendations: Proposed NPDES permits for Lower Columbia River Federal Hydroelectric Projects – June 7, 2022* document.[61]

In this document, EPA describes the three differences as follows:

[61] EPA Region 10 401(a)(2) Evaluation and Recommendations on Proposed NPDES Permits for Lower Columbia River Federal Hydroelectric Projects - June 7, 2022

1. Oregon has a numeric criteria of a 7-day average daily maximum of 20°C for salmon and steelhead migration corridors designated use [OAR-340-041-0101-Table 101B; OAR 340-041-0028(4)(d)] and 13°C for the salmon and steelhead spawning through fry emergence designated use at RM 141.5-143.5 in the Lower Columbia River (to protect chum salmon spawning) from October 15 – March 31 below Bonneville Dam [OAR-340-041-0101-Table 101B; OAR 340-041-0028(4)(a)]; Washington has a numeric criterion of a 1-day daily maximum of 20°C for spawning and rearing uses for aquatic life [WAC 173-201A-602-Columbia River Note 1].
2. Oregon's migration corridor criterion includes the following supplementary narrative temperature criterion, "The seasonal thermal pattern in Columbia and Snake Rivers must reflect the natural seasonal thermal pattern." [OAR 340-041-0028(4)(d)]; Washington's water quality standards do not include this criterion.
3. Oregon also includes the following narrative temperature criterion: "…waterbodies must have cold water refugia that are sufficiently distributed so as to allow salmon and steelhead migration without significant adverse effects from higher water temperatures elsewhere in the waterbody." [OAR 340-041-0028(4)(d)]; Washington's water quality standards do not include this criterion. [62]

EPA does not discuss the practical effect of developing a plan for two different states with sometimes similar, but sometimes different water quality standards wherein one state may take the position that an action is necessary to meet its water quality standards while another disagrees. This is particularly problematic with temperature issues in a system as complex as the Columbia River System and its tributaries and where there are fundamental disagreements and general misunderstanding of temperature issues within the System. This proposal is not an effective way to work collaboratively on water temperature solutions.

Additionally, even though EPA did not adopt Oregon's *Initial Study of Temperature* condition because it "would be premature to require the Corps to focus on only one possible solution where a suite of actions may better meet Oregon's water quality requirements for temperature and decrease water temperatures in the Lower Columbia River," EPA admits its "recommendation does not preclude the Corps from undertaking a study of lower operating pools, as proposed by Oregon DEQ."[63] Thus, EPA, in effect, is avoiding removing this action from the table even though neither EPA nor Oregon has information that supports lower reservoir levels while the Corps has presented analysis that demonstrates that lower reservoir levels has negligible effects on water temperature. This lack of action by EPA will not lead to a collaborative approach to address water temperatures, and instead will lead to protracted disagreements between entities with water quality modeling (the Corps) and Oregon that cannot provide data in support inclusion of this condition.

[62] *Id.* at page 15.
[63] *Id.* at page 16.

Finally, any plan EPA, Oregon and Washington approve to address water temperature must be consistent with federal law and long-standing Ninth Circuit precedent on Corps operations and water temperature.[64]

VII. Conclusion

Bonneville appreciates the opportunity to submit these comments in response to the questions that EPA posted as part of the public notice and to respond to its draft recommendation. As stated above, BPA does not believe EPA should add in whole, or partially, any conditions the NPDES permit because they are either duplicative or do not relate to water quality requirements. As always, we welcome the opportunity to discuss our comments with EPA. Please contact me if you have any questions on these comments.

Sincerely,

SCOTT G. ARMENTROUT
Executive Vice President, Environment, Fish and Wildlife

[64] *National Wildlife Fed. v. U.S. Army Corps*, 384 F.3d 1163, 1178 (9th Cir. 2004) ("a more sensible interpretation of the CWA is that discretionary operations of the dams, consistent with the statutory regime established by Congress, should comply with state water law standards.").

COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

700 NE Multnomah Street, Suite 1200
Portland, Oregon 97232

(503) 238-0667
F (503) 235-4228
www.critfc.org

June 21, 2022

Ms. Jennifer Wu
Environmental Engineer, NPDES Permits Section
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3188
Sent via email: Wu.Jennifer@epa.gov

Re: Comments Lower Columbia River Federal Dams NPDES 401(a)(2)

Dear Ms. Wu:

The Columbia River Inter-Tribal Fish Commission (CRITFC) appreciates the opportunity to provide comments on the EPA's Evaluation and Recommendations on the Proposed NPDES Permits for Lower Columbia River Federal Hydroelectric Projects. CRITFC supports EPA's recommendation[1] to modify the conditions of the draft NPDES permits. This recommendation will ensure that both Washington and Oregon's water quality standards for temperature are met and provides for Oregon DEQ to approve the Water Quality Attainment Plan (WQAP).

EPA's position, however, that dam operations are most felt and are primarily managed from the Washington side of the river make little sense to tribal people, both culturally and ecologically. CRITFC and its member tribes take a whole-of-river approach to interactions with N'chi Wana (Columbia River). CRITFC strongly recommends that the scope of Oregon DEQ's authority to review and approve the WQAP not be limited to only those actions that touch upon the three areas that EPA has identified as different from WA's standards, i.e., 13°C chum spawning, natural seasonal pattern, and distribution of cold-water refuges. Oregon's input should be broad in scope and application.

CRITFC also supports Oregon DEQ's request that the Army Corps of Engineers conduct extensive analysis and modeling of all potential temperature attainment conditions. Modeling results and analysis that is done by the Corps must be made public and peer reviewed. CRITFC also recommends the use of EPA's RBM10 model to further support and evaluate the impact of proposed dam operations at all four lower Columbia dams when evaluating alternatives.

For comments on these draft NPDES permits, CRITFC hereby incorporates by reference the comments filed by its member tribes, including the Yakama Nation and the CTUIR. Thank you for this opportunity to submit these comments. Please contact Dianne Barton, Water Quality Coordinator, with any questions at 503-238-0667.

[1] EPA Region 10 Clean Water Act Section 401(a)(2) Evaluation and Recommendation on the Proposed NPDES permits for Lower Columbia River Federal Hydroelectric Projects, June 7, 2022.

Sincerely,

Aja K. DeCoteau
Executive Director

Columbia Riverkeeper - Northwest Sportfishing Industry Association
Save Our Wild Salmon Coalition - Northwest Environmental Defense Center
Oregon Chapter of the Sierra Club

June 21, 2022

Office of Water and Watersheds
U.S. EPA Region 10
Attn: Jennifer Wu
1200 Sixth Ave., Ste. 155, OWW-191
Seattle, WA 98101

Submitted via email to wu.jennifer@epa.gov

RE: EPA's recommended conditions to address Oregon's CWA Sec. 401(a)(2) objection regarding NPDES permits for lower Columbia River dams.

Dear Ms. Wu:

Columbia Riverkeeper, Northwest Sportfishing Industry Association, Save Our Wild Salmon Coalition, Northwest Environmental Defense Center, and the Oregon Chapter of the Sierra Club (collectively, "we") submit the following comments about the U.S. Environmental Protection Agency's (EPA) recommended National Pollution Discharge Elimination System (NPDES) permit conditions responding to Oregon's Clean Water Act Section 401(a)(2) objections for the following hydroelectric facilities on the lower Columbia River:

- Bonneville Project (WA0026778);
- The Dalles Lock and Dam (WA0026701);
- John Day Project (WA0026832);
- McNary Lock and Dam (WA0026824).[1]

We represent thousands of people who rely on clean water and healthy aquatic ecosystems in Oregon, Washington, and elsewhere in the Columbia River Basin and have long awaited EPA's issuance of these NPDES permits, which will help control the U.S. Army Corps of Engineers' (Corps) illegal discharges of oil, heat, and toxic pollution from the Dams. However, these NPDES must contain conditions resulting from Washington and Oregon's exercise of their authorities under Section 401 of the Clean Water Act. **EPA's recommended permit conditions do not, as Section 401(a)(2) of the Clean Water Act requires, ensure compliance with Oregon's water quality standards.** We offer the following comments to ensure that the four

[1] Collectively, "the Dams."

NPDES permits comply with the Clean Water Act and protect Oregon's high-quality waters, fisheries, and healthy aquatic ecosystems.

a. Dams make the Columbia River too hot for salmon.

The Dams add heat—through cooling water and reservoir heating—to a river system recognized by EPA as too warm to support designated uses, including salmon habitat. Nearly two decades ago, federal scientists declared the Columbia River too hot for healthy salmon runs. Heat pollution, including from the Dams, contributes to elevated water temperatures in the Columbia River. In 2021, EPA completed the Columbia and Snake River Total Maximum Daily Load Analysis for Temperature (temperature TMDL). The temperature TMDL is a pollution budget designed to protect salmon from hot water in the Columbia and Snake rivers. Notably, EPA's modeling clearly indicated that the Dams increase water temperatures in ways that cause or contribute to water quality standard violations. Specifically, John Day and McNary dams together raise the temperature of the Columbia by an average of 0.6, 0.8, and 0.8 degrees C in August, September, and October respectively.[2] Salmon need cool water to survive, and the Dams are contributing to a hot water crisis in the lower Columbia River.

The devastating impact of hot water pollution on Columbia River salmon is not hypothetical. The Columbia experienced unreasonably high temperatures in summer 2015, warm enough to kill more than 277,000 adult sockeye salmon, mostly in the Columbia River below McNary pool.[3] Unfortunately, subsequent years have shown that adult sockeye frequently die in significant numbers in the hydrosystem, largely due to warm water conditions created or exacerbated by the Dams. Last summer, PIT tag data shows a 70% mortality rate for Snake River

[2] EPA, *Columbia and Snake River Temperature TMDL*, pp. 58–59 (2021).
[3] *Columbia Riverkeeper v. Pruitt*, Case No. 2:17-cv-00289-RSM, Defendants' Answer, ¶ 3 (May 15, 2017) (EPA admits that the 2015 fish kill was "attributable primarily to warm water.").

sockeye,[4] and sockeye were observed dying of fungal infections in lower Columbia River tributaries when the Columbia became too warm to allow upstream migration (see picture above). Adult Snake River steelhead and Chinook also suffer significant mortality from the hydrosystem. After eliminating other sources of mortality, the arduous summer and fall migrations through the hydrosystem appear to be killing 10–20%[5] of all pre-spawn adult fish from these populations, which are not meeting recovery objectives mandated by the Endangered Species Act. Moreover, these estimates of out-right fish mortality in hydrosystem do not capture the effects of chronic or cumulative thermal stress that may contribute to additional mortality or reproductive failure upstream. Clearly, the Columbia River is too warm to support healthy native fish populations.

b. EPA's recommended conditions do not ensure that the Corps will stop violating Oregon's water quality standards for temperature.

We strongly support the substance of Oregon's objection and proposed conditions: that the Corps should conduct thorough, and transparent, analyses of drawdown's ability to reduce the Dams' negative impacts on water temperature—and, where appropriate, implement drawdown. Because reservoir surface area and water residence time appear to be significant drivers of water temperature changes in the lower Columbia, reservoir drawdown (which reduces both) is among the few strategies that could meaningfully affect summer and fall water temperatures. As we understand it, drawdown is one of the strategies for meeting temperature standards that Washington could require the Corps to analyze in the Water Quality Attainment Plans (WQAP) in the draft NPDES permits. Based on this understanding, we do not object to EPA's recommendation to modify the WQAP conditions to require the Corps to address both Washington and Oregon's water quality standards for temperature.

However, Oregon must have authority to review and approve the *whole* WQAP required by each of the draft permits. We strongly disagree with EPA's recommendation to limit Oregon's authority over the WQAPs to policing the Corps' compliance with certain, limited aspects of Oregon's water quality standards. Under Clean Water Act Section 401(a)(2), the conditions proposed by EPA to address Oregon's objection must "[e]nsure" that the Corps will stop violating Oregon's water quality standards.[6] EPA's recommended conditions fail this test.

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[4] *See* DART Conversion Rate webpage (Note: DART's conversion data are not corrected for harvest or straying).

[5] U.S. Army Corps of Engineers, *Columbia River System Operations Draft Environmental Impact Statement*, p. 3-302 (2020).

[6] "If the imposition of conditions cannot insure such compliance such agency shall not issue such license or permit." 33 U.S.C. § 1341(a)(2). Accordingly, a permit subject to a 401(a)(2) objection that does not ensure compliance with the objecting state or tribe's water quality standards is issued *ultra vires*.

Relying on a different state to fully enforce its own temperature standards is not sufficient to ensure the Corps' compliance with Oregon's water quality standards. At best, EPA's recommended conditions create the *possibility* that the Corps will comply with Washinton's standards and, incidentally, come close to meeting Oregon's. This is a far cry from ensuring that the Corps will meet all of Oregon's standards and, therefore, each final NPDES permit must give Oregon authority over the *entire* WQAP.

EPA's recommendations are contrary to the purpose of Section 401 of the Clean Water Act, which was intended to give states and tribes the authority to protect their own water quality standards. With great respect and appreciation for Washington's leadership in addressing Columbia River temperature problems caused by the dams, Oregon has an equal stake in the outcome and there is no good reason to prevent Oregon from simultaneously safeguarding its distinct water quality standards. Indeed, the highly contentious and politicized nature of issues involving the Dams—coupled with the Corps' decades of recalcitrance and obfuscation in response to water temperature problems and Clean Water Act violations—strongly suggest that additional oversight by Oregon is warranted and reasonable. Nothing in Section 401(a)(2) compels EPA to propose the absolute minimum conditions necessary to meet an objecting state or tribe's water quality standards. Rather, Section 401(a)(2)'s directive to "condition [the] permit in such manner as *may be* necessary to *insure* [sic] compliance with applicable water quality requirements" (emphasis added) strongly suggests that EPA has broad latitude to go beyond proposing the minimum conditions that might result in attainment of downstream water quality standards. Accordingly, and in light of the purpose of Section 401, EPA should not unnecessarily limit Oregon's authority over the WQAPs.

Finally, the recommended conditions would not prevent Oregon from requiring study and implementation of drawdown at John Day and other reservoirs. As explained above, and based on EPA's own modeling, the dams keep the Columbia significantly hotter in the late summer and fall than the river would be in a free-flowing state. Accordingly, the dams are violating OAR 340-041-0028(4)(d)'s requirement that "The seasonal thermal pattern in [the] Columbia . . . must reflect the natural seasonal thermal pattern." To address these violations, Oregon could still require the Corps, through the WQAP process, to study and implement drawdown.

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CONCLUSION

We request that EPA revise the draft permits as described above to comply with the Clean Water Act, protect the Columbia River and its fisheries resources, and ensure that the Army Corps will finally stop violating Oregon's water quality standards.

Sincerely,

Miles Johnson
Senior Attorney
Columbia Riverkeeper
miles@columbiariverkeeper.org

On behalf of:

Columbia Riverkeeper

Northwest Sportfishing Industry Association

Save Our Wild Salmon Coalition

Northwest Environmental Defense Center

Oregon Chapter of the Sierra Club

Confederated Tribes and Bands
of the Yakama Nation

Established by the
Treaty of June 9, 1855

June 21, 2022

Sent via Electronic Mail

Michael Regan
Administrator
United States Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, D.C. 20460

RE: OREGON'S CLEAN WATER ACT SECTION 401(A)(2) OBJECTION TO DRAFT NPDES PERMITS FOR LOWER COLUMBIA RIVER FEDERAL HYDROELECTRIC FACILITIES

Dear Administrator Regan:

I write on behalf of the Confederated Tribes and Bands of the Yakama Nation ("Yakama Nation") in response to the Environmental Protection Agency's ("EPA") request for comments regarding Oregon's Clean Water Act Section 401(a)(2) objection to the draft National Pollutant Discharge Elimination System permits ("NPDES Permits") for federal hydroelectric facilities on the Lower Columbia River.

Since time immemorial, the original, free, and independent tribes and bands that later confederated as the Yakama Nation have depended on the Columbia River for cultural, spiritual, and economic wellbeing. In Article III of the Treaty with the Yakamas, U.S. – Yakama Nation, June 9, 1855, 12 Stat. 951 ("Treaty of 1855"), the Yakama Nation expressly reserved the right to fish at "usual and accustomed places," which includes sites on the Columbia River.[1] The Yakama treaty negotiators knew that securing these rights was crucial to guaranteeing the vitality of their people. For the Yakama Nation, the exercise of fishing rights in particular was "not much less necessary…than the atmosphere they breathed."[2]

The Yakama Nation acts as a steward over the Columbia River in exchange for the livelihood that it provides, "speaking for the things that cannot speak for themselves." The Yakama Nation has seen considerable success revitalizing certain fish populations and habitat throughout the Columbia River Basin. However, this success, as well as other ongoing efforts to restore and protect other fish populations, is threatened by the significant degradation of water quality in the Columbia River caused by industrial development and exacerbated by climate change. Salmon need clean, cool water to

[1] *See, e.g., U.S. v. Winans*, 198 U.S. 371 (1905).
[2] [2] *Id.* at 381.

survive. The mass sockeye fish kill in 2015, which the EPA concedes was "attributed primarily" to extreme water temperature exceedances,[3] was devastating to both the Yakama Nation's fisheries and its culture. Compared to other point and nonpoint sources, dams contribute a disproportionately high amount of heat pollution to the Columbia River, which the EPA has likewise acknowledged.[4] The Yakama Nation therefore has a significant interest in ensuring that the federal hydroelectric facilities on the Columbia River are regulated in a manner that will prevent exceedance of water quality standards and thereby protect fish and, by extension, the Yakama Nation's Treaty-reserved rights.

In light of our interest in proper regulation of federal hydroelectric facilities, the Yakama Nation appreciates the opportunity to comment on Oregon's objection to the NPDES Permits. The Yakama Nation supports the recent efforts by Oregon and Washington to exercise their authority under the Clean Water Act to address water temperature degradation in the Columbia River. The states' efforts are aimed at moving away from the management status quo that has allowed water temperature to reach extreme levels.

Oregon's objection to the NPDES Permits and its proposed temperature study are examples of creative regulatory solutions for controlling excess water temperatures. The Yakama Nation therefore strongly supports the inclusion of Oregon's proposed temperature study as condition of the NPDES Permits: either as an express condition or as a potential component of the existing water quality attainment plan ("WQAP") condition. The study will yield valuable information regarding potential changes to federal hydroelectric operations that would improve water quality. The dire temperature conditions in the Columbia River demand new management strategies, which can only occur if regulatory agencies are equipped with adequate data. In particular, regulatory agencies must be prepared to prevent or respond to extraordinary events such as the 2015 fish kill. Oregon's proposed study can establish potential actions for avoiding injury to fish populations when temperatures are expected to rise. For these reasons, the Yakama Nation is in favor of the EPA including Oregon's proposed temperature study as a mandatory condition in the NPDES Permits.[5]

Given the differences between Oregon's and Washington's water quality standards, Oregon's involvement in the NPDES Permit implementation is necessary to comply with applicable water quality standards. Therefore, the EPA's recommendations rightly provide that the U.S. Army Corps of Engineers ("Corps") must develop a WQAP for complying with *both* Oregon and Washington's water quality standards. However, the

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[3] Defendant's Answer at 2, *Columbia Riverkeeper v. Pruitt*, No. 2:17-cv-00289-RSM (W.D. Wash. May 15, 2017).
[4] ENVT'L PROT. AGENCY, COLUMBIA AND LOWER SNAKE RIVERS TEMPERATURE TOTAL MAXIMUM DAILY LOAD ("TMDL"), 50 (2021).
[5] The Yakama Nation recommends that the temperature study also investigate the relationship between temperature and dredging actions. For example, the study should consider 1) whether a lack of dredging limits the ability to operate reservoirs at certain levels to mitigate temperature problems and 2) whether dredging can create or supplement cold water refugia for salmon during warm seasons.

EPA's recommendations limit Oregon's review and approval authority to Corps "actions that are needed to meet Oregon's water quality standards for temperature, where those standards are different from Washington's temperature water quality standards."[6] The Yakama Nation disagrees with this approach. Piecemeal involvement by Oregon will lead to confusion and disagreement regarding the scope of Oregon's authority with respect to the WQAP. This will undermine the effectiveness of the WQAP and frustrate the implementation process.

The EPA's recommendations should instead provide that Oregon's authority be equivalent to Washington's, with Oregon having review and approval power over the WQAP as a whole. Oregon's equivalent authority is supported by Section 401(a)(2) of the Clean Water Act, which requires the relevant federal permitting agency to "condition such license or permit in such a manner as may be necessary to [e]nsure compliance with applicable water quality standards" of a neighboring jurisdiction. Section 401(a)(2) does not provide that a federal permitting agency may diminish a neighboring jurisdiction's oversight of the permit implementation because of overlap between the neighboring jurisdiction's and the certifying state's water quality standards. The EPA should condition the NPDES Permits such that Oregon has review and approval power over the entire WQAP to ensure the Corps' compliance with Oregon water quality standards. Otherwise, Oregon will need to rely on a different state to evaluate compliance with its water quality standards.

The Yakama Nation understands that Oregon's proposed temperature study would require an evaluation of, among other actions, reservoir operations at Minimum Operating Pool ("MOP"). Again, the Yakama Nation strongly supports the study because of the potential benefits to fish populations. However, it is important to note that operating the federal hydroelectric reservoirs at MOP has the potential to affect other Yakama Nation rights and interests. As such, the Yakama Nation must be involved with the development of the study and any subsequent implementation plans. For example, lower water levels may make it more difficult for Yakama Nation members to exercise their Treaty fishing rights from existing sites and platforms. The relevant agencies must consult with the Yakama Nation to account for this in the study and, to the extent that MOP operations would detrimentally affect Treaty fishing access, develop adequate mitigation strategies.

Furthermore, drawing down the reservoirs may expose archeological sites, burial areas, and other sensitive cultural resources. The Yakama Nation's Cultural Resources Program is the only agency equipped to identify these cultural resources, assess the effects of a change in reservoir operations, and approve of mitigation plans for any adverse effects, which may include federal agency protection of exposed cultural resources from destruction and looting. Accordingly, it is critical that the EPA, the

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[6] ENVT'L PROT. AGENCY, EPA REGION 10 CLEAN WATER ACT SECTION 401(A)(2) EVALUATION AND RECOMMENDATIONS ON THE PROPOSED NPDES PERMITS FOR LOWER COLUMBIA RIVER FEDERAL HYDROELECTRIC PROJECTS, 3-4 (JUNE 7, 2022).

Corps, Oregon, Washington, and any other relevant agency consult with the Yakama Nation concerning the impact of reservoir operations on cultural resources and any other affected tribal right or interest. We do not raise these concerns to dissuade the relevant agencies from studying MOP operations or any other action that could mitigate temperature problems. Rather, the Yakama Nation highlights these issues to affirm the need for consultation and coordination to achieve a successful outcome.

The Yakama Nation looks forward to further engagement with the EPA, the Corps, and the states regarding this important matter. If you have any questions regarding this letter, please contact Phil Rigdon, our Department of Natural Resources Superintendent, at (509) 865-5121, ext. 4655, or phil_rigdon@yakama.com.[7]

Sincerely,

Delano Saluskin

DELANO SALUSKIN
CHAIRMAN, YAKAMA NATION TRIBAL COUNCIL

[7] In submitting this comment, Yakama Nation does not waive its sovereign immunity from suit, nor does it waive, alter, or otherwise diminish its sovereign rights, privileges, or remedies guaranteed by the Treaty with the Yakama of 1855 (12 Stat. 951). Furthermore, submission of this comment does not substitute for formal government-to-government consultation on this matter.

Thank you for the opportunity to comment on the Lower Columbia River Federal Dams NPDES Permits 401(a)(2). For the record, my name is Liz Hamilton and I serve as the Executive Director of the Northwest Sportfishing Industry Association (NSIA). NSIA is a trade organization representing 250 businesses and other NGOs that are dependent upon healthy fishery resources. In the northwest, sportfishing generates five Billion in economic output and employs nearly 37,000 in the service of over two million customers. Columbia Basin fisheries are the driver of these economics and cold water is necessary for the survival of the fisheries that sustain our industry.

The fish are in a crises mode, even with some of the best ocean conditions in 20 years. This is in part, because the Columbia River dams make the river too hot for salmon and other native fish in the summer and fall. We've all seen the tragic images of dead, dying and diseased salmon from 2015 and 2021 in the lower Columbia. The EPA's own data demonstrate that these dams, especially John Day Dam, substantially raise the Columbia's temperature. The John Day reservoir has long been recognized as one of the most lethal sections of a smolt's outmigration for many reasons in addition to temperature pollution. NSIA supports a serious look at summertime drawdown of the John Day pool, including potential mitigation measures.

NSIA is grateful to the State of Oregon for their leadership to protect the water quality through the use of CWA Section 401(a)(2) and to seek solutions to protect and restore the fisheries of the Columbia basin.

We ask that EPA incorporate the supplemental conditions proposed in Oregon's Oct. 8, 2021, letter into the final NPDES permits for the Lower Columbia Dams. Oregon's requirement to study and, where necessary, implement drawdown of John Day and other Lower Columbia reservoirs is one of the only measures that can be undertaken, absent dam removal, that will appreciably decrease the temperature pollution created by the mainstem dams. A smaller reservoir profile is expected to lower water temperatures by reducing reservoir surface area available to absorb solar radiation and decreasing the amount of time water spends in each reservoir.

Lowering the reservoir profile not only helps lower temperatures, but it also improves water transit time (WTT). According to the Comparative Survival Study (CSS), WTT is one of the main drivers of wild steelhead and wild spring Chinook survival at multiple life stages. (see Figure 2.9, below from the CSS)

The Army Corps of Engineers has always resisted drawdown, so it's necessary to make it enforceable. It's important to remember that during the development of the federal CRSO EIS, the action agencies failed to identity and develop meaningful actions to address temperature pollution caused by the existence and operations of federal projects and their reservoirs. This process is an opportunity to address this deficiency by the action agencies and explore actions to mitigate the temperature pollution caused by federal projects. If not the ACOE, then who, and if not now, then when, will the federal action agencies address the harm on endangered species from federal projects and activities.

Thank you,

Liz Hamilton, Executive Director
Northwest Sportfishing Industry Association

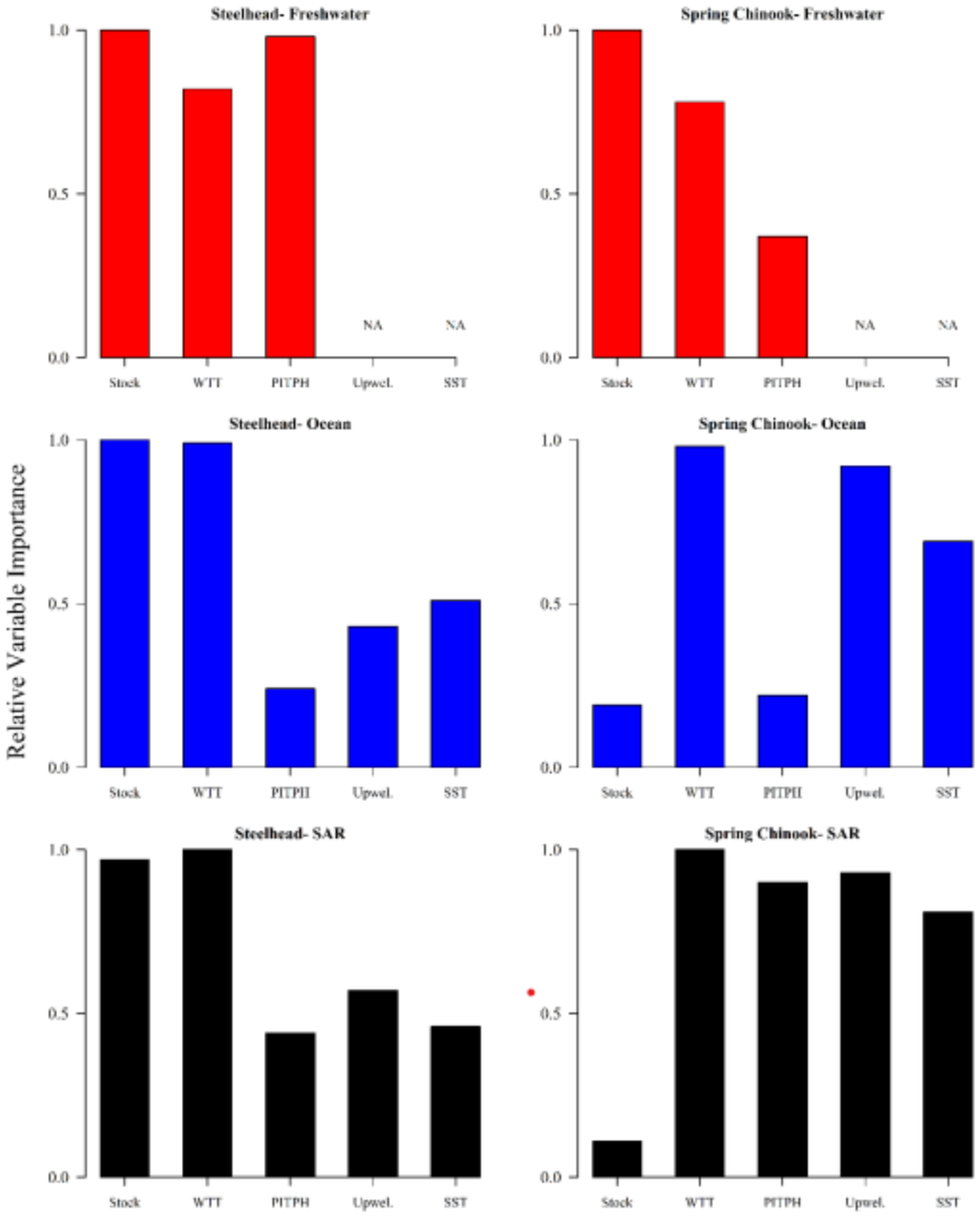

Figure 2.9 Relative Variable Importance for group (Stock), powerhouse passage events (PITPH), water transit time (WTT), April upwelling (Upwel.) and sea surface temperature (SST) in models of freshwater survival (upper row), ocean survival (middle row), and SAR survival (bottom row) for wild steelhead (left column) and wild spring Chinook salmon (right column).

Oregon
Kate Brown, Governor

Department of Environmental Quality
Agency Headquarters
700 NE Multnomah Street, Suite 600
Portland, OR 97232
(503) 229-5696
FAX (503) 229-6124
TTY 711

June 21, 2022

Sent via Electronic Mail to Wu.Jennifer@epa.gov

Mr. Casey Sixkiller, Regional Administrator
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900
M/S ECL-122, Seattle WA 98101-3188

RE: June 7 Lower Columbia River Federal Dams NPDES Permits 401(a)(2) EPA Public Hearing regarding Oregon's Objection Pursuant to Section 401(a)(2) to Permits for Bonneville Project, WA0026778, The Dalles Lock and Dam, WA0026701, John Day Project, WA0026832, and McNary Lock and Dam, WA0026824

Dear Mr. Sixkiller,

Today, twelve species of salmon and steelhead in the Columbia River basin are listed as threatened or endangered under the federal Endangered Species Act. These fish are central to the histories, cultures, and economies of Northwest tribes and to the State of Oregon. Unless we act now, on multiple fronts and in multiple ways, we will very soon begin to lose these iconic species.

According to NOAA Fisheries' 2020 Columbia River System Biological Opinion, high water temperatures in the mainstem lower Columbia River in the summer and fall are a key limiting factor in the recovery of the listed species. In the Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load (TMDL) issued by EPA in August 2021, EPA determined temperature impairments are primarily due to the cumulative impacts of climate change *and* dam impoundments. According to EPA's TMDL, the temperature impacts of McNary and John Day dams on the Columbia River in September and October average 0.8°C, Columbia and Lower Snake Rivers Temperature TMDL, Tables 6-9 and 6-10. These impacts, together with impacts from other impoundments on the Columbia and Snake Rivers, are the predominant causes of regular and significant temperature exceedances in the late summer and fall.

On October 8, 2021, Oregon Department of Environmental Quality (DEQ) objected to draft NPDES permits for four Columbia River federal dams. The draft National Pollutant Discharge Elimination System (NPDES) permits incorporated conditions from the Washington Department of Ecology under its authority under Section 401(a)(1) of the Clean Water Act. DEQ notified EPA of its objection to the draft NPDES permits based on a determination that the discharge will affect the quality of Oregon's waters and violate state water quality requirements. Specifically, DEQ determined the requirements in the draft permit will not assure attainment of Oregon's water quality standards for temperature. In the objection letter, DEQ provided an example provision that would require the U.S. Army Corps of Engineers (USACE) study alternative actions to reduce thermal loading resulting from the operations of the dams and implement viable options that benefit water quality and improve the smolt-to-adult return ratios of listed salmonids.

On June 7, 2022, EPA held a public hearing to address Oregon's objections to the draft NPDES permits.

During the hearing, DEQ noted that its primary goal in filing the objection was to include requirements in the permit that reflect USACE obligation to do its part to address high water temperatures in the mainstem Lower Columbia River, based on relevant analyses and carried out in a transparent manner. As DEQ noted in the hearing, the request to analyze changes to minimum operating pool and its effect on temperature was intended to be illustrative and not to limit the options available to achieve compliance. DEQ specifically noted that its concerns also related to Oregon-specific narrative standards for adequate cold water refugia in the mainstem Columbia, particularly in the lengthy John Day pool where such refugia do not currently exist.

During the hearing, USACE took the position that the conditions proposed by DEQ are outside the scope of this action—i.e., EPA's issuance of an NPDES permit and accompanying Clean Water Act Section 401 certification and conditions. USACE also took the position that the proposed conditions were outside the scope of 401 certification when it challenged the Section 401 Water Quality Certifications issued by the Department of Ecology for the four lower Snake and Columbia River dams. In a Summary Judgment Order issued November 3, 2021, the Pollution Control Hearings Board, State of Washington, found against USACE and held the 401 Certification conditions appropriately evaluated the impacts of the dams' operations including their impoundments and releases, not only the point source discharges. In its holding, The Pollution Control Hearings Board relied on the *Jefferson Co. PUD v. Washington Department of Ecology* case, where the U.S. Supreme Court concluded the permitted or licensed activities, and not merely discharges, must comply with state water quality standards under Section 401, and the State could place restrictions on the activity. The position taken by USACE regarding scope is not consistent with longstanding legal precedent on this issue or the 1971 EPA Section 401 regulations that apply to these permit applications. While the 2020 EPA Section 401 regulations attempted to limit state authority as advocated by USACE in this case, those regulations did not apply to Washington's certifications for these applications.

During the hearing, EPA discussed its proposed action to address DEQ's objections. EPA indicated it is proposing to add conditions to its draft permit responding to DEQ's objections. DEQ understands one change would be to require that the water quality attainment plan (WQAP) required by Washington Department of Ecology's 401(a)(2) conditions be subject to review and approval of both Ecology and DEQ. The condition would require USACE to develop measures in the WQAP to ensure that both Washington and Oregon's water quality standards for temperature are met. EPA's proposed conditions recognize Oregon's water quality standards for temperature are different and, in some respects, may require measures which go beyond those required by Washington. The three provisions in Oregon's water quality standards that are more protective are:

1. 13°C for the salmon and steelhead spawning through fry emergence designated use at RM 141.5-143.5 in the Lower Columbia River (to protect chum salmon spawning) from October 15 – March 31 below Bonneville Dam [OAR-340-041-0101-Table 101B; OAR 340-041-0028(4)(a)];

2. "The seasonal thermal pattern in Columbia and Snake Rivers must reflect the natural seasonal thermal pattern." [OAR 340-041-0028(4)(d)]; and

3. "…waterbodies must have cold water refugia that are sufficiently distributed so as to allow salmon and steelhead migration without significant adverse effects from higher water temperatures elsewhere in the waterbody." [OAR 340-041-0028(4)(d)].

DEQ appreciates EPA's evaluation of the issues raised in its objection and believes that EPA's proposed

action represents a significant step towards ensuring Oregon's water quality standards are achieved. However, DEQ does have remaining concerns regarding the sufficiency of the recommendation to address the objection.

As structured in EPA's proposal, limiting DEQ's review and approval to solely the provisions of Oregon's water quality standards that are different than Washington's may inadvertently set up an inefficient system for coordination. Oregon believes it is in the best interest of Washington, Oregon, EPA and USACE to ensure the processes set up to review and evaluate implementation are coordinated and provide, to the greatest possible extent, a mutually agreed upon path to implementation. Further, DEQ appreciates that the Federal Columbia River Power System is indeed a system within a complex, large basin and needs to be evaluated as such to ensure any changes to management and operation of dams maximize benefits and do not have unintended consequences. There are many different components to Oregon's and Washington's water quality standards that could result a complex matrix of water quality requirements and outcomes. Limiting DEQ's review only to the provisions highlighted by EPA in its recommendation may create a system by which DEQ's review is constrained in a manner that risks Washington and Oregon providing different perspectives and input on implementation at different elements of their standards at different points in time, potentially resulting in disjointed implementation and outcomes which are not in the best interest to Washington, Oregon, EPA and USACE. The review process should facilitate DEQ and Ecology providing similar direction to USACE on evaluation and selection of alternatives to comply with water quality standards.

Consequently, while Ecology's conditions provide a framework to achieve Washington's water quality standards, DEQ requests EPA include permit conditions that ensure USACE evaluates alternatives to attain both Washington and Oregon's water quality standards, in addition to compelling USACE to implement those alternatives.

To comprehensively address Oregon's objection, DEQ respectfully requests EPA also include the following additions to Washington Ecology's 401 conditions:

1. The permittee must implement temperature control strategies that will lead to meaningful progress toward, and ultimately meet, the load allocations in the Columbia and Lower Snake Rivers Temperature TMDL to attain applicable Washington and Oregon federally approved water quality standards for temperature.

2. The permittee must submit a proposed water quality attainment plan (WQAP) to Ecology and to DEQ for their review and approval. The WQAP shall include all applicable requirements in WAC 173-201A-510(5), Compliance schedule for Dams, and OAR 340-041-0028(12), and must include a detailed strategy for achieving Washington's and Oregon's water quality standards for temperature and protecting associated designated uses. The plan must include conditions and measures for meeting load allocations in the Columbia and Lower Snake Rivers Temperature TMDL. In addition, the plan must also include and evaluation of and a plan for how USACE will address the following Oregon water quality-related requirements:
    a. conditions in fish bypass systems of the dam;
    b. the seasonal thermal pattern water quality standard;
    c. the cold water refugia narrative criterion in Oregon standards; and
    d. water quality standards for spawning and fry emergence [13 degrees Celsius] in RM 141.5 to 143.5 downstream of Bonneville Dam.

3. Lastly, EPA should include a provision that USACE shall implement the approved WQAP on a compliance schedule that meets the water quality-related requirements of Ecology and DEQ.

In summary, DEQ is seeking permit conditions that require USACE to describe and document its operational constraints and evaluate alternatives to meet its temperature load allocation to achieve compliance with water quality standards as required by EPA's NPDES permits and the temperature TMDL. Again, Oregon reiterates that EPA must incorporate more specific requirements in the NDPES permits for the development and implementation of actions to reduce temperature increases resulting from the operation of these facilities to ensure that applicable Oregon state water quality standards are met.

Sincerely,

Richard Whitman
Director

Cc: Jim McKenna, Oregon Policy Analyst
Jason Miner, Oregon Governor's Natural Resources Policy Director
Dan Opalski, Director, EPA Water Division Region 10
Geoff Van Epps, U.S. Army Corps of Engineers Northwest Division Commander
Laura Watson, Director, Washington State Department of Ecology

June 20, 2022

Ms. Jenny Wu
Environmental Protection Agency (EPA) - Region 10
Park Place Building
1200 6th Avenue
Seattle, WA 98101

Re: PNWA Comments on the State of Oregon's objection under the Clean Water Act to EPA's proposed permits for four federal hydroelectric facilities that discharge to the Lower Columbia River

Dear Ms. Wu,

On behalf of the Pacific Northwest Waterways Association ("PNWA"), thank you for the opportunity to provide comments regarding Oregon's objection under Clean Water Act Section 401(a)(2) to the proposed NPDES permits for the four Lower Columbia River dams.

PNWA recognizes the critical importance of salmon recovery in the Columbia River Basin, and of protecting our water resources. We agree that as our region looks to improve salmon runs, all benefits and drawbacks of the various measures being considered to improve conditions for fish, including those related to water temperatures, need to be thoroughly assessed. We also agree with EPA that there is no silver bullet for salmon recovery. It will take a range of improvements throughout the basin and our oceans to make a difference for our iconic Northwest fish.

Oregon's objection suggests that such a bullet exists, by operating the four Lower Columbia River dams below the minimum operating pools ("MOP") established by the U.S. Army Corps of Engineers ("Corps"). Thus, Oregon's objections ask EPA to impose a condition that would require the Corps to study whether changes to operating pools would reduce thermal loading resulting from the operation of the facilities. For the reasons that follow, PNWA strongly supports EPA's recommendation declining to impose such a condition and instead directing the Corps to develop a comprehensive plan to ensure that Oregon's water quality standards for temperature are met, but only where those standards differ from Washington's.

Who We Are

PNWA is a regional trade association with over 150 members, including ports, tug and barge operators, steamship and cruise lines, grain elevators, agricultural producers, electric utilities, irrigation districts, and union labor throughout Washington, Oregon, and Idaho. Since our founding in 1934, we have advocated, not only for the development of infrastructure for navigation, electric power, and irrigated agriculture on the Columbia and Snake River System, but also for salmon recovery. PNWA supports projects to advance and protect the region's environment, economic health, and freight mobility, including our multi-modal transportation system, which provides safe, efficient, and reliable links to competitive domestic and world markets.

4224 NE Halsey Street, Suite 325
Portland, OR 97213

Telephone: 503-234-8550
Fax: 503-234-8555

A subset of our membership, the Inland Ports and Navigation Group ("IPNG"), is an intervener in the Columbia River System Operation EIS lawsuit in support of the federal government and their plan to operate the Columbia River basin's 14 multipurpose dams. IPNG strives to protect inland navigation, hydropower, and irrigation on the Columbia and Snake Rivers, while supporting a healthy environment and robust fish runs in the Northwest.

As part of our partnership efforts in the region, PNWA and IPNG members work to support increased salmon runs in the Columbia Basin and throughout the Northwest. These include activities like toxics reduction through the Columbia River Basin Restoration Act, ecosystem restoration, culvert replacement, and advocacy in support of increased fish passage at sites like Howard Hansen and Mud Mountain dams. We also partner with the Columbia River Basin Intertribal Fish Commission to support their efforts on predator abatement and we were key participants in the Columbia Basin Partnership Task Force, a NOAA led effort which brought together a range of stakeholders, many of whom have been adversaries in the courtroom, to look at long-term salmon recovery in the basin.

Discussion

Oregon's objections ask EPA to incorporate "specific requirements for the development and implementation of actions to reduce temperature increases resulting from operations of [the Columbia River dams]." Specifically, Oregon's objections seek a condition that would require the Corps to "study alternative actions to reduce thermal loading resulting from the operation of the facility," including an analysis to determine whether "changes in minimum operating pools (limited by [MOP])" would accomplish that result.[1] Notably, Oregon does not define MOP, but its filings in litigation related to the Columbia River Biological Opinion and Environmental Impact Statement make clear that Oregon perceives MOP as allowing for lower elevations than those established by the Corps' definition of MOP. EPA's proposed recommendation appropriately rejects Oregon's request and instead recommends that the water quality attainment plan ("WQAP") conditions set forth in the draft NPDES permits be modified to: (1) require the Corps to develop a plan that will ensure Oregon's water quality standards for temperature are met; and (2) allow Oregon to review and approve the WQAP, but only where Oregon's water quality standards differ from Washington's. That is the appropriate result for three reasons.

Reducing reservoir elevations would provide no measurable temperature benefits and would be harmful to fish.

First, the Corps has already determined that reducing reservoir elevations will not have a meaningful impact on temperature. The Corps recently performed a modeling exercise using Oregon's proposed MOP elevations and found no detectible benefits or changes to river temperatures. And there is little dispute that reducing elevations to those levels would be harmful to fish. Operating at Oregon's MOP elevations would make adult and juvenile fish passage more difficult, reduce water supply at hatcheries and refuges, and create more habitat for avian predators. Requiring an action that would expose fish

[1] Notably, Oregon's original objections did not request such a specific condition for temperature. Instead, Oregon asked for a more general host of temperature monitoring and management to ensure that load allocations are being obtained and measures are taken to protect cold water refugia locations from impingement by thermal plumes from dam operations—ostensibly recognizing that no single solution exists to the temperature challenges on the Columbia.

populations to new and additional risks, with no evidence of any corresponding temperature benefits, would make little sense.

Reducing reservoir elevations would make commercial navigation through the Columbia River locks dangerous and cause serious service interruptions.

Second, reducing the operating pools to the levels requested by Oregon would be devastating for commercial river users who transport millions of tons of cargo, including more than 40% of US wheat exports through the Columbia River locks each year. The Corps is authorized to maintain a 14-foot navigation channel at MOP, and that depth is necessary to ensure that vessels are able to safely and efficiently navigate up- and down-river. To provide the highest tonnage transported per mile of diesel consumed and maximize the design capacity of the congressionally authorized navigation channel, river tows operate at a 13.5 foot design depth. Barge lines are already continuously entering and departing the locks with only half a foot of clearance under the tow. It is critical that these clearances be maintained.

Reducing reservoir elevations would make navigation substantially more dangerous. Operating at lower elevations would result in a smaller, narrower river, with less depth beneath vessels navigating through the locks. River flows, however, would remain the same, which ultimately would cause added currents. At lower pool elevations, discharge volumes at the spillways would become more subject to the natural thalweg of base flow. This equates to stronger cross sets and eddy-effects when transiting in and out of the projects' lower basins. However, the narrower navigable channel would limit the speed and power that vessel operators could use to cope with the more challenging flow patterns, making for a dangerous situation. In addition, less water means less shareable "sea room." Currently, commercial towing vessels, cruise vessels, and recreation vessels all share the river, with limited clearance to pass by each other. Operating at MOP would only reduce the already limited opportunities for safe passing arrangements and would increase the potential for vessel-to-vessel conflicts.

In addition to the safety concerns, operating below Corps-established MOP levels would cause service interruptions in the region. For example, reducing the reservoir elevations at the McNary pool would create sediment deposits above the dam, which would limit service to the Port of Umatilla. Barging companies would no longer be able to serve the Burbank elevator at full capacity, with only specific vessels being able to access the elevator. And the Wallula grain elevator would become unserviceable. These are just a few examples of the service challenges that would be created by Oregon's requested MOP operations.

Because reducing operating elevations to below Corps-established MOP would have no measurable temperature benefits but would substantially hinder navigation and endanger vessel operators and crews, cruise line passengers, and the vessels and other equipment, PNWA strongly supports EPA's recommendation not to include Oregon's requested condition.

Imposing Oregon's requested condition would be unnecessarily limiting.

PNWA agrees with EPA's conclusion that imposing Oregon's requested condition would be unnecessarily limiting. It makes no sense to narrow the Corps' inquiry to a studying a single action, already shown to have no measurable effect on temperature. Parties across the region agree that the Corps should be

Pacific Northwest Waterways Association
4224 NE Halsey Street, Suite 325
Portland, OR 97213

Telephone: 503-234-8550
Fax: 503-234-8555

considering a suite of actions to collectively achieve Oregon's water quality requirements for temperature, and the Corps should be permitted to develop a WQAP that takes advantage of all of the potential solutions available.

Conclusion

For all of the reasons described above, PNWA supports EPA's recommendation and strongly encourages EPA to adopt that recommendation as drafted.

Sincerely,

Heather Stebbings
Executive Director, PNWA

Pacific Northwest Waterways Association
4224 NE Halsey Street, Suite 325
Portland, OR 97213

Telephone: 503-234-8550
Fax: 503-234-8555

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www.ppcpdx.org

June 21, 2022

Jennifer Wu
United States Environmental Protection Agency

Submitted electronically to Jenny Wu (wu.jennifer@epa.gov)

RE: Order Approving a Modification to the Oregon Water Quality Standard for Total Dissolved Gas in the Columbia River Mainstem

Dear Ms. Wu,

The Public Power Council (PPC) appreciates this opportunity to comment on the proposed discharge permits for Federal hydroelectric projects in the lower Columbia River. PPC is the trade association for the non-profit, public power utilities in the Pacific Northwest that are eligible to purchase wholesale power and transmission services from the Bonneville Power Administration (BPA) at cost. Northwest public power depends on BPA for a reliable, cost-effective, and environmentally responsible power supply. For its part, public power has regularly demonstrated its commitment to funding a world-class fish and wildlife program to mitigate for the impacts of Columbia River System Operations (CRSO) in a scientifically sound manner. Public power therefore has vital interests in the system from both economic and environmental stewardship perspectives.

In addition to these comments, PPC supports and urges the Environmental Protection Agency (EPA) to give the utmost consideration to the comments submitted by BPA and the U.S. Army Corps of Engineers.

Question 1: Are additional permit conditions necessary to ensure compliance with Oregon's water quality requirements for temperature?

No. As a first matter, Oregon's complaint does not provide any specific evidence that current operations exceed waste load or load allocations under the TMDL. Further, the condition by Oregon to change operating pool levels would not achieve functional changes in temperature. Technical analysis by the U.S. Army Corps of Engineers shows

that the predicted impact of the Minimum Operating Pool operation on temperature would be less than measurement error, such that any actual impact would likely be undetectable through monitoring.[1] Additionally, given the complexity and variability of temperature dynamics, the impact of the proposed operation is so subtle that it is impossible to determine its effects given the variability of other factors such as flow and meteorology.

Generally speaking, the temperature of inflows has the largest impact of water temperature in the tailwaters of these projects. The Columbia River often exceeds the Oregon criteria upstream of its boundary.

In light of these factors and the additional requirements already adopted in the course of Washington Department of Ecology's certification, no additional permit conditions are necessary or appropriate.

Question 2: Is it necessary for EPA to include any or all aspects of Oregon's example condition described above to meet Oregon's water quality requirements for temperature? If so, which aspects of the example condition are necessary to ensure compliance with Oregon's water quality requirements for temperature, and why?

No. As described above, the Minimum Operating Pool operation proposed by Oregon would not measurably impact temperature conditions. While not helping temperature, Oregon's example conditions would dramatically impact hydropower production, which is a congressionally authorized purpose of these federal projects. PPC refers EPA to the comments of BPA and the U.S. Army Corps of Engineers for a discussion of the specific Minimum Operating Pool operation impacts.

The adequacy and reliability of the Northwest electric system is already a concern today and proposed dramatic changes to the system could cause blackouts as more and more dispatchable thermal resources are retired without substantive replacements for the lost capacity. These reliability concerns are exacerbated by increasingly extreme weather events and wildfires. Substantial loss of hydro generation output or flexibility would also greatly increase the energy costs of public power communities, which already disproportionately serve low-income and rural areas of the Northwest.

[1] *See National Wildlife Fed. v. U.S. Army Corps of Engineers*, 384 F.3d 1163, 1175-76 (9th Cir. 2004) (where the U.S. Army Corps concluded that altering its operational activities cannot and will not eliminate the occasional occurrence of water temperature exceedences, the Court deferred to the agency's expertise and found that the Corps was not arbitrary and capricious and did not act contrary to law in concluding that there were no further steps it could take to reduce temperature exceedences in the lower Snake River).

The operation of the four Lower Columbia projects at issue in Oregon's complaint play a particularly vital role. These projects are synchronous generators that provide crucial support to the grid in terms of rotating inertia and voltage support. This support is valuable both for reliable load service to the local area (including the Portland and Vancouver metro areas) as well as the interconnected transmission grid as a whole. The projects also provide Automatic Generation Control, which adjusts generation automatically at the projects to compensate for unexpected imbalances in loads and resources in the balancing authority and maintain system frequency. More frequent operation of units at minimum levels inhibits the ability of the projects to provide these important functions and increases the chances of grid instability or blackouts.

The North American Reliability Corporation (NERC) recently released its 2022 Summer Reliability Assessment,[2] which concluded that the Western Interconnection is already at elevated risk of energy emergencies today. This risk is not hypothetical and substantial reduction of the operational capability and flexibility of federal hydropower on the Columbia River would exacerbate a potential reliability crisis while impeding the congressionally authorized purposes of the projects. Endangering human health and safety along with the economic vitality of the West for no measurable water quality benefit is beyond consideration.

Further, EPA Region 10 identified three areas where Oregon's water quality standards for temperature are different from Washington and recommended that Oregon DEQ's WQAP review and approval authority apply only to actions related to meeting those areas. There is no evidence in the record that Oregon's example conditions would produce meaningful benefits to any or all of the three areas.

Question 3: As an alternative to Oregon's example condition, what permit conditions would ensure that Oregon's water quality requirements for temperature are met?

Please see answers to Question 1 and Question 2 above, which are incorporated by reference in response hereto.

Question 4: Are there other conditions EPA should consider in the draft permits to meet Oregon's water quality requirements for temperature?

Please see answers to Question 1 and Question 2 above, which are incorporated by reference in response hereto.

[2] Documents retrievable at: https://www.nerc.com/news/Pages/Extreme-Weather-Heightens-Reliability-Risks-this-Summer.aspx

Thank you for your consideration of these comments.

Sincerely,

Scott Simms
Executive Director, Public Power Council

EPA Region 10 Tribal Consortium (RTOC)
P.O. Box 689 Spokane, Washington 99210
www.region10rtoc.net

June 21, 2022

Jenny Wu
Environmental Engineer, NPDES Permits Section
EPA Region 10
1200 6th Avenue, Suite 155 (19-CO4)
Seattle, Washington 98101

Sent via email - wu.jennifer@epa.gov

RE: Comments on Proposed Discharge Permits for Federal Hydroelectric Projects in the Lower Columbia River

Dear Ms. Wu:

Please find attached comments sent on behalf of the Tribal Caucus of the Region 10 Tribal Operations Committee ("RTOC") on the State of Oregon's objection under the Clean Water Act to EPA's proposed permits for four federal hydroelectric facilities that discharge to the Lower Columbia River. These comments are not sent on behalf of EPA Region 10 or any employees of EPA, but solely on behalf of the tribal government representatives of the RTOC.

The RTOC is keenly interested in solving the temperature problem in the Columbia River to ensure salmon and steelhead have a safe migratory pathway as they complete their lifecycles and fully support the comments submitted by Tribal governments on this matter.

Background

In 2015, the U.S. Army Corps of Engineers submitted NPDES permit applications for discharges associated with the operation of the federal dams in the Columbia and Snake. In 2020, EPA requested 401 certifications from the Washington Department of Ecology ("Ecology") and the Oregon Department of Environmental Quality ("DEQ"). Ecology issued final 401 certifications with conditions for the dams in the lower Snake and lower Columbia Rivers. The temperature-related conditions in these certifications required the Corps to: (1) implement temperature control strategies that meet the load allocations in the TMDL once it is issued and (2) develop and

implement a water quality attainment plan ("WQAP") that meets Washington's temperature water quality standards within two years to reduce temperatures in the reservoirs.

On May 15, 2020, Oregon DEQ notified EPA Region 10 that it had determined that the discharges from the dams will affect the quality of Oregon's waters and violate state water quality requirements. Oregon DEQ stated that it was objecting to the issuance of the NPDES permits and requested a public hearing. DEQ provided example conditions in its objection letter. The example conditions would require the Corps to conduct modeling of different reservoir levels on water temperatures in the Lower Columbia River in the first year of the permit and develop and submit an implementation plan that would include a timeframe and milestones for implementing actions in the second year of the permit.

On May 8, 2021, EPA established the Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load ("TMDL"). In the TMDL, EPA examined existing river temperature data and found that water quality criteria established to protect summer salmon and steelhead migration are exceeded frequently between June and October, and that temperature criteria established for fall salmonid spawning are exceeded in the lower Columbia in the Fall[1]. EPA attributed the temperature impairments to the cumulative impacts of climate change and dam impoundments (the reservoir water). Additionally, EPA found that temperature reductions of up to 3.1 degrees Celsius are necessary to meet water quality criteria within the lower Columbia River and reductions of up to 2.8 degrees Celsius are necessary to meet summer water quality criteria in the lower Snake River[2].

General Comments

The Columbia River basin is home to culturally significant salmon, steelhead, lamprey, and other important species. Unfortunately, these populations are threatened with extinction due in large part to the development of hydroelectric dams. Clean, cold water is essential for salmonids, particularly during their pre-spawn migration up the Columbia to natal spawning grounds in Idaho, Oregon, and Washington. Juvenile salmon are also exposed to excessive temperatures on their migration to the ocean. As witnessed in 2015 with the massive 2015 sockeye salmon kill, river temperatures can be lethal. Climate change is expected to create further challenges for salmon and steelhead in the Columbia-Snake basin.

Specific Comments

In reviewing Oregon's objection to the permits, EPA recommended: (1) the Water Quality Attainment Plan ("WQAP") must ensure both Washington's and Oregon's water quality standards for temperature are met; (2) Ecology and DEQ review and approve the WQAP; and (3) the scope of Oregon's review and approval of the WQAP is limited to the three areas where Oregon's water quality standards for temperature is substantially different that Washington's. We support these recommendations.

[1] EPA, May 2021. *Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load.*
[2] *Id.*

Given the magnitude of the temperature problem in the lower Columbia River and the urgency to act to protect migrating salmon and steelhead, we believe that additional conditions should be considered. Such actions could include habitat restorations action in key tributaries that would provide meaningful and measurable temperature reduction benefits that would support, enhance, or restore cold-water refugia. The Deschutes, Yakima, and Umatilla Rivers are likely candidate tributaries where focused habitat improvements would provide tangible benefits.

We support including all of Oregon's example conditions into the NPDES permits for the Lower Columbia River.

Oregon's temperature standard for the Columbia includes a narrative criterion, cold-water refugia, that is sufficiently distributed to allow salmon and steelhead migration without significant adverse effects from higher water temperatures elsewhere in the water body. We believe this component of Oregon's temperature standard supports the incorporation of a tributary strategies as part of a broad strategy, including operational changes at the dams to ensure the load allocations assigned to the Lower Columbia dams are met. To be clear, a watershed-based program would not be in lieu of operational changes at the dams, but in addition to those actions, primarily because it is unlikely, as EPA itself noted, that operational changes alone would meet the load allocations assigned to the dams.

Lastly, given that other federal and non-federal dams in the Columbia Basin either contribute to the temperature problem or help mitigate it, a basin-wide approach that examines how these facilities can act collectively to reduce temperatures in the lower river is warranted. Additionally, the Columbia River Treaty is currently being renegotiated and additional flows to support ecosystem function are being contemplated. Such potential changes should be examined with regard how they might help, or hurt, other efforts to keep the Columbia cool and safe for salmon and steelhead.

The RTOC appreciates your consideration of these comments and your action to protect the health of the Columbia River.

Sincerely,

Raymond Paddock
Region 10 RTOC, Tribal Caucus Co-chair

June 21, 2021

Jenny Wu
Environmental Engineer, NPDES Permits Section
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101

Submitted via email to Wu.Jennifer@epa.gov

Re: Oregon's Objections to the Draft Discharge Permits for Federal Hydroelectric Projects in the Lower Columbia River

Dear Ms. Wu,

Thank you for the opportunity to provide comments on Oregon's objection under Clean Water Act (CWA) Section 401(a)(2) to the proposed NPDES permits for the four Lower Columbia River federal dams. Founded in 1983, The Freshwater Trust (TFT) is a nonprofit conservation organization committed to accelerating the pace and scale of watershed restoration through the design and implementation of data-driven, science-based solutions to some of the nation's biggest water quality challenges. TFT has a track record of success using this type of science-based watershed approach, including working closely with the Idaho Power Company to design and implement its CWA section 401 temperature compliance program (the Snake River Stewardship Program in the Hells Canyon), the City of Medford and City of Ashland water quality trading programs in the Rogue River basin, and a number of other programs around the western U.S. We bring these experiences to bear in submitting the following comments.

In light of the scope of the water quality concerns and the challenges faced by native salmonids, TFT believes that a watershed-based program is necessary to respond to the objections raised by Oregon and improve instream conditions in the Lower Columbia River. Specifically, given the major projected thermal exceedances associated with these permits, the need to meaningfully address cold water refugia shortcomings in the Lower Columbia, the limitations of technological and operational changes to achieve compliance at the facilities, and the accelerating impacts of climate change, TFT strongly encourages EPA and the states to embed an integrated watershed restoration approach into the thermal compliance strategy associated with all four permits. TFT recommends looking at this problem holistically at the basin scale—not permit-by-permit—in order to maximize investment in the most meaningful places.

Scope of the Problem

River temperatures in the Snake and Columbia Rivers create significant challenges for threatened salmon and steelhead populations, including juveniles migrating to the ocean and adults migrating to natal streams to spawn. River temperatures

that exceed 20°C cause adverse effects to migrating juveniles in the form of decreased growth, impairment of smoltification, increased disease and predation, and impairment to spawning success.[1] The massive sockeye salmon die-off in 2015 demonstrated that excessive temperatures in the Columbia and Snake can be lethal. Climate change is expected to exacerbate these problems.

In the Columbia and Lower Snake River Temperature Total Maximum Daily Load (TMDL), EPA examined existing river temperature data and found that water quality criteria established to protect salmonids are frequently exceeded in the Lower Columbia River.[2] EPA attributed these impairments to the cumulative impacts of climate change and dam impoundments. Additionally, EPA found that temperature reductions of up to 3.1°C are necessary to meet water quality criteria within the lower Columbia River. Significantly, as EPA noted in the TMDL, even if the temperature reductions identified in the TMDL are fully realized, it is unlikely that the numeric criteria will be met at all times and places.

This is emblematic of a widespread challenge. Since 1960, the U.S. has spent $2 trillion trying to improve water quality.[3] Despite this tremendous investment, a large majority of waterways remain impaired, with accelerating drought, flood, and extreme temperature risks rapidly compounding the problem. Responding to these issues requires taking a watershed-based approach that strikes the right balance between technological upgrades at facilities and targeted watershed improvements that improve instream conditions and directly support the beneficial uses underlying the water quality standards (i.e., improving thermal refugia to increase salmonid survival). As Oregon's objection implicitly acknowledges, it is unlikely that an exclusive focus on operational and infrastructure improvements at the dams will result in the attainment of the water quality standards.

Given the scale of the issues, a more inclusive, integrated compliance approach to improving outcomes is needed. Such an approach should start with NPDES permit compliance actions but could expand to include a host of other voluntary and regulatory actions, ensuring that the majority of environmental efforts in the watershed are aligned and thereby maximizing the potential benefits and outcomes. Failing to pursue solutions on the same scale as the problems will jeopardize the long-term viability of salmonids and the health of the watershed.

Improving Water Quality at a Relevant Scale Requires a Watershed-based Approach

In reviewing Oregon's objection to the permits, EPA recommended that: (1) The Water Quality Attainment Plan (WQAP) ensures both state's water quality standards for temperature are met, (2) Ecology and DEQ review and approve the WQAP, and (3) DEQ limit its review and approval of the WQAP to the three areas where Oregon's temperature standards differ substantially from Washington's. TFT supports these recommendations but comments separately to elaborate on these concepts. In particular, in analyzing the temperature problem in the Lower Columbia River, TFT has concluded that:

(1) Widespread agreement exists among regulatory agencies, regulated entities, tribes, NGO's, and other stakeholders that operational changes at the dams alone, including reservoir drawdown, will not be sufficient to meet the Lower Columbia dams' load allocations, and will not address the

[1] U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 10 OFFICE OF WATER, EPA REGION 10 GUIDANCE FOR PACIFIC NORTHWEST STATE AND TRIBAL TEMPERATURE WATER QUALITY STANDARDS, EPA 910-B-03-002 (Apr. 2003).

[2] U.S. ENVIRONMENTAL PROTECTION AGENCY, COLUMBIA & LOWER SNAKE RIVERS TEMPERATURE TOTAL MAXIMUM DAILY LOAD (2021).

[3] D.A. Keiser, C.L. Kling & J.S. Shapiro, *The Low but Uncertain Measured Benefits of US Water Quality Policy*, 116 Proc. Nat'l Acad. Sci. 5262, 5262 (Mar. 19, 2019), *available at* https://www.pnas.org/content/116/12/5262.

cold water refugia recommendations that EPA has identified.[4] It is also important to note that technological solutions have already created significant unintended consequences in the Columbia basin (e.g., the selective water withdrawal tower at Pelton Round Butte).

(2) There is widespread agreement that an integrated, watershed-scale approach that addresses ecological needs in the Lower Columbia River and the key tributaries would provide real benefits to the cold water refugia essential for the continued survival of salmonids. An aggressive, multi-pronged strategy focused on the most imperiled cold water tributaries (e.g., Deschutes, John Day, Umatilla) would create, support, and enhance cold water refugia at the mouths of these rivers, helping to achieve maximum attainable compliance with both Oregon's numeric temperature criteria and its narrative requirement calling for a sufficient distribution of cold water refugia so as to support salmon and steelhead migration.

(3) EPA and the states have the authority to address this complex issue at the basin-scale across multiple permits. Specifically, by drawing on the sources of regulatory flexibility and precedent (e.g., NPDES bubble permits, multi-discharger variances, 33 U.S.C. section 1274 watershed pilot project authority, and existing water quality trading examples), EPA and the states can define an approach to meaningfully address this complex problem in an integrated manner at the appropriate scale. Dealing with this complex issue dam-by-dam, permit-by-permit will not work.

Therefore, TFT strongly recommends that EPA, in addition to including Oregon's example conditions in the permits, also require the development and implementation of an integrated watershed restoration program as another component of the Lower Columbia Dams NPDES permits. Such a program would occur in addition to, not in lieu of, operational and structural improvements at the dams. The technological and operational changes would be optimized to the "point of diminishing returns"—the point where the cost-benefit ratio changes and it becomes more beneficial to invest in watershed improvements instead. As with similar existing programs, modern analytics would be used to identify the anticipated benefits and costs of all potential watershed projects, enabling the prioritization of the most beneficial actions. The implementation of these actions would then be tracked and the benefits quantified in a transparent manner, which in combination with defined milestones in the NPDES permits, provide the accountability required by the CWA. In this way a watershed-based program could constitute a durable, legally defensible strategy for overcoming the Columbia's seemingly intractable water temperature issues, while providing a foundation for attracting additional pile-on investment to build from and enhance the NPDES-driven investments.[5]

Our experience with the Snake River Stewardship Program and the Rogue basin trading programs demonstrates that watershed actions that are measurable, trackable, and enforceable can provide regulatory certainty, produce tangible pollutant reduction outcomes, generate critical co-benefits that don't just meet compliance obligations, but also meaningfully improve the watershed (e.g., improved

[4] U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 10, COLUMBIA RIVER COLD WATER REFUGES PLAN, EPA 910-R-21-001 (Jan. 2021), www.epa.gov/sites/default/files/2021-01/documents/columbia-river-cwr-plan-final-2021.pdf.

[5] The Deschutes River provides an excellent example. In addition to temperature and cold water refugia concerns, the Deschutes has major nutrient impairments and water quantity challenges that threaten the salmonid species that drive the temperature standards. Improving land and water management practices in the Deschutes will reduce these impacts, but successful implementation requires strategically fitting them into a broader watershed framework that includes water delivery, on-farm water use, habitat needs, and runoff management—elements that are currently managed across multiple agencies and with inadequate and siloed funding streams. NPDES-driven temperature investment can and should serve as the foundation for coordinating and deploying multiple funding sources toward the best combination of multi-benefit projects that can help mitigate temperature conditions while also addressing these other limiting factors.

habitat, fire and drought resiliency), and jumpstart a regional restoration economy. In the case of the Lower Columbia River dams, operational changes alone will almost certainly not achieve the required load reductions, including a complementary watershed strategy is likely the only feasible alternative capable of producing the temperature reductions, instream habitat, and refugia improvements essential to salmon and steelhead migration. Given the magnitude and urgency of the problem, it is imperative that such a strategy be given the utmost consideration.

Should you have questions, please contact me at CThomas@TheFreshwaterTrust.org.

Sincerely,

Chris Thomas

Senior Attorney & Policy Specialist
The Freshwater Trust

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NORTHWESTERN DIVISION
PO BOX 2870
PORTLAND, OR 97208-2870

June 21, 2022

Mr. Dan Opalski
Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Dear Mr. Opalski,

In August 2015, the U.S. Army Corps of Engineers (Corps) applied for Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) permits for the Corps' facilities on the lower Columbia and lower Snake rivers. The Corps submitted applications to Environmental Protection Agency (EPA) for projects discharging on the Washington side of the river (all eight projects) and Oregon Department of Environmental Quality (ODEQ) for projects discharging on the Oregon side of the river (Bonneville, John Day, and McNary). On May 7, 2020, the Washington Department of Ecology (Ecology) issued Section 401 Water Quality Certifications (WQCs) for all eight projects. The Corps submitted comments on the draft NPDES permits and WQC and incorporates those comments by reference with this letter.

On May 15, 2020, ODEQ sent an objection to the EPA under CWA Section 401(a)(2) (hereafter "Section 401(a)(2)") for the draft NPDES permits for the Corps' four lower Columbia River dams (Bonneville, The Dalles, John Day, and McNary dams). In September 2021, EPA issued permits for the four lower Snake River projects but did not issue the permits for the lower Columbia River projects due to the pending objection from Oregon. ODEQ further clarified their objection on October 8, 2021. ODEQ objected to the draft permit as not being sufficient to ensure compliance with Oregon's water quality requirements, even with the addition of the requirements from Ecology's Section 401 WQCs to the draft permit conditions.

On April 27, 2022, EPA issued a public notice for a hearing on June 7, 2022 regarding ODEQ's objection under Section 401(a)(2) for the draft NPDES permits for the four lower Columbia River dams. On June 8, 2022, EPA held a hearing to determine whether additional permit conditions are necessary to ensure compliance with Oregon's water quality requirements. During the hearing, EPA announced the following recommendation:

> *EPA Region 10 recommends that the [Water Quality Attainment Plan] WQAP conditions in the draft NPDES permits be modified to require the Corps to develop a plan that will ensure that both Washington and Oregon's water quality standards for temperature are met. Further, EPA Region 10 recommends the*

WQAP conditions be modified to require that Ecology and Oregon DEQ review and approve the WQAP. EPA Region 10 recommends that the scope of Oregon DEQ's review and approval of the WQAP be limited to actions that are needed to meet Oregon's water quality standards for temperature, where those standards are different from Washington's temperature water quality standards, in three areas that EPA Region 10 has identified:

- *13°C for the salmon and steelhead spawning through fry emergence designated use at RM 141.5-143.5 in the Lower Columbia River (to protect chum salmon spawning) from October 15 – March 31 below Bonneville Dam [OAR-340-041-0101-Table 101B; OAR 340-041-0028(4)(a)];*
- *"The seasonal thermal pattern in Columbia and Snake Rivers must reflect the natural seasonal thermal pattern." [OAR 340-041-0028(4)(d)]; and*
- *"…waterbodies must have cold water refugia that are sufficiently distributed so as to allow salmon and steelhead migration without significant adverse effects from higher water temperatures elsewhere in the waterbody." [OAR 340-041-0028(4)(d)].*

EPA Region 10 recommends that Oregon DEQ's WQAP review and approval authority apply only to actions related to meeting the three areas listed above. Where Washington's water quality standards for temperature are substantially similar to Oregon's, Oregon DEQ would not have review and approval authority on the WQAP.

In response to this recommendation, as expressed in more detail below, these conditions are not necessary to ensure compliance with Oregon's water quality requirements. If EPA determines these conditions are necessary, the Corps would like to express concern over what seems to be a confusing process regarding the proposed multi-agency WQAP approval process. We recommend that EPA define the plan and protocols that capture an approval process. In the event that there is disagreement between the States, this protocol would layout an issue resolution process to address the conflicting views from the states. If a process is not established the Corps could be caught in unattainable situation and be found to be in violation of NPDES permit requirements if the WQAP, or portion(s) thereof, is not approved. The Corps encourages EPA to define the approval process more thoroughly and specifically address the following questions:

1. Is the WQAP only approved when both Oregon and Washington approve their respective portions of the WQAP?
2. Is there a process in which EPA would override a State's WQAP disapproval; and what is the timeline for approval? These steps should be fully acknowledged and defined in the NPDES permits.

The Corps would also like to point out that the Columbia River System (CRS), which extends from Canada to the Pacific Ocean, includes a complex network of dams, and other features, as well as multiple tributary inputs that drive flow and the seasonal thermal patterns observed in the CRS. The Corps' dams, and specifically the lower Columbia River dams are just one small piece of the puzzle. The lower Columbia River dams are run-of-river, well-mixed and generally isothermal, so whatever water temperature flows in, flows out. These dams lack the ability to control water temperatures like high-head, storage reservoirs such as Dworshak Dam and are also influenced by all upstream activities. Counter to the beliefs of some, operational changes at the lower Columbia River projects are not enough to meet Oregon's narrative criteria and suggesting otherwise is wrought is disinformation and plain ignorance. The Corps' offers its science-based tools approach to help improve conditions within the CRS for anadromous fish and other aquatic species but cannot do it alone. We look forward to our continued partnership with EPA and the States as we move forward and carry out NPDES and TMDL processes.

As part of the hearing, EPA sought comments on four questions listed in their public notice:

1. Are additional permit conditions necessary to ensure compliance with Oregon's water quality requirements for temperature?
2. Is it necessary for EPA to include any or all aspects of Oregon's example condition described above to meet Oregon's water quality requirements for temperature? If so, which aspects of the example condition are necessary to ensure compliance with Oregon's water quality requirements for temperature, and why?
3. As an alternative to Oregon's example condition, what permit conditions would ensure that Oregon's water quality requirements for temperature are met?
4. Are there other conditions EPA should consider in the draft permits to meet Oregon's water quality requirements for temperature?

The Corps respectfully submits the following comments answering these four questions, along with other relevant information.

1. Are additional permit conditions necessary to ensure compliance with Oregon's water quality requirements for temperature?

No. The Corps does not believe that additional permit conditions are necessary to ensure compliance with Oregon's water quality requirements for temperature. First, as discussed below, Oregon's objection is beyond the scope of Section 401(a)(2). Second, the requirements included in the draft NPDES permits adequately address discharges of heat from the projects; these heat discharges are minimal and do not result in noncompliance with Oregon's water quality requirements. Third, the WQC for each dam that was issued by Ecology already requires the Corps to take additional

actions beyond the scope of an NPDES permit to address temperatures in the lower Columbia River. Each of these is discussed in depth below.

A. *Oregon's Objection is Outside the Scope of Section 401(a)(2)*

Oregon's objection is improper under Section 401(a)(2). Section 401(a)(2) provides, in part:

> Whenever such *a discharge* may affect, as determined by the Administrator, the quality of the waters of any other State, the Administrator within thirty days of the date of notice of application for such Federal license or permit shall so notify such other State, the licensing or permitting agency, and the applicant. If, within sixty days after receipt of such notification, such other State determines that such *discharge* will affect the quality of its waters so as to violate any water quality requirements in such State …

33 U.S.C. § 1341(a)(2) (emphasis added). The statute's plain language unambiguously limits EPA and Oregon to considering whether the "discharge" will affect the quality of the waters of any other State so as to violate any water quality requirements of the State. As EPA states in the preamble to the proposed CWA Section 401 Water Quality Certification Improvement rule:

> Section 401(a)(2) limits EPA to considering whether a "discharge" from an activity may affect the water quality of a neighboring jurisdiction, and likewise limits a neighboring jurisdiction to determining whether a "discharge" from the activity will affect its water quality so as to violate any water quality requirements. Accordingly, EPA interprets the scope of section 401(a)(2) as limited by the statutory language to considering potential effects only from a "discharge" from an activity.[1]

Oregon's stated objection is that the "requirements included in the draft permit will not assure attainment of Oregon's water quality standards for temperature." As further explained in Oregon's letter dated May 15, 2020, the basis for Oregon's concern is their assertion that the dams "alter water temperature and thermal regimes by altering retention times within reaches, changing exposure time to heating and cooling influences, changing water depths, and reducing shading." These concerns pertain to purported impacts on temperature from the existence of dams, not the point source discharges which are the subject of EPA's NPDES permit. Nor has Oregon related its stated temperature concerns to any specific "discharge" from the dams that are subject to the NPDES permits.

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[1] EPA Proposed CWA Section 401 Water Quality Certification Improvement Rule, 87 Fed. Reg. 35,365 (June 9, 2022)

For purposes of Section 401(a)(2), the relevant issue is whether the requirements in the NPDES permit will ensure the *discharge* complies with Oregon's water quality requirements for temperature. The relevant discharge for which the Corps has applied for an NPDES permit is the point source discharge of cooling water, which contains heat. As further described below, the discharge of cooling water has a negligible effect on temperature, will meet EPA's wasteload allocation established by the lower Columbia and Snake Rivers temperature TMDL, and will comply with Oregon's water quality requirements for temperature. The objection from Oregon does not pertain to the *discharges* that are the subject of the EPA NPDES permit, but rather the State is trying to improperly expand this objection to pertain to temperature impacts purportedly caused by the existence of dams in the Columbia River system, as well as other non-point source influences. This is beyond the scope of Section 401(a)(2), and EPA therefore lacks statutory or regulatory authority to grant a permit with conditions based on this erroneous reading and interpretation of the CWA.

B. *EPA's NPDES Permits Will Ensure the Discharges Comply with Oregon's Water Quality Requirements*

EPA examined the impacts of climate change, 15 dams, 23 major tributaries, 127 individual NPDES point sources, stormwater, upstream boundary temperatures, and withdrawals from the Banks Lake Pump Project and Dworshak Dam. EPA found that climate change and nonpoint source dam impacts are the dominant sources of impairment, with impacts that are an order-of-magnitude higher than point sources, agricultural withdrawals, and tributaries.

The EPA modeling scenarios and subsequent RBM10 assessment completed as part of the TMDL estimated the impacts of dams, Dworshak Dam cold water releases, tributaries, boundary conditions and NPDES point sources. For point sources, EPA's analysis of NPDES sources discharging to the Columbia and lower Snake Rivers indicates that the cumulative loading of heat from these point sources is slightly less than 0.1°C. The allocation of 0.1°C to the point sources is therefore achievable by the point sources without imposing a disproportionate burden on other source categories. At the same time, the allocation for point sources will ensure proper management of future new or expanded point source discharges.

Given the negligible heat load contributed to the NPDES point discharges from the dams, such releases have little to no impact on attainment of Oregon's water temperature requirements.

C. *Washington Department of Ecology's WQC Provide Sufficient Assurance that Oregon's Water Quality will be Protected.*

The WQCs for each dam issued by Washington Department of Ecology on May 7, 2020, which will be incorporated into the NPDES permits, already directs the Corps to

take additional actions beyond the scope of an NPDES permit to address temperatures in the lower Columbia River. However, Oregon stated that the requirements in the WQC are not adequate to assure compliance with Oregon's water quality requirements. Oregon then goes on to propose a study that includes a specific operation and subsequent implementation of that operation, that Oregon has presented no basis to conclude that it will assist in lowering temperatures in the lower Columbia River. The detriments of the specific operation that Oregon requests will be covered in the Corps' response to EPA's second question. Other than that specific operation, the study and approval process is similar to the requirements in the WQC.

It is critical to note that the Washington's numeric water quality requirements are generally more stringent than Oregon's comparable water quality requirements, so any action taken to comply with Washington's standards will also be protective of Oregon's water quality. For the lower Columbia River, the Washington water quality requirement stipulates that the daily maximum water temperature should not exceed 20°C, whereas Oregon's water quality requirement is a 7-day average of the daily maximum (7dAM) water temperature not to exceed 20°C[2]. The latter is less stringent.

While the Corps does not concede that the scope of the Washington WQC was proper, as evidenced by the Corps' appeal of the WQCs, the Corps will nonetheless take all feasible steps to comply with the WQCs consistent with the Congressional purposes of the projects. See *NWF v. USACE*, 384 F.3d 1165 (9th Cir. 2004). Under Washington's WQCs, the Corps is directed to take several actions related to river temperature, which are similar to what Oregon is requesting in their proposed condition (with the exception of the minimum operating pool (MOP) operation). Specifically, the Washington WQCs require:

> *B.2. Water Quality Standards Attainment: (RCW 90.48.080 and WAC 173-201A-510(5)).*
>
> *(a) In addition to the draft NPDES permit requirements for temperature monitoring at most outfalls, the Permittee must implement temperature control strategies and meet the load allocations in the Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load once issued.…*
>
> *(c) The Permittee must consult with Ecology to develop a water quality attainment plan (WQAP) per the conditions below:*
>
> *1. The WQAP shall include all applicable requirements in WAC 173-201A-510(5), Compliance schedule for Dams, and must include a detailed strategy for achieving Washington's water quality standards for temperature and associated designated*

[2] EPA, 2021, Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load (TMDL), Appendix A: Temperature Water Quality Standards for the Columbia and Lower Snake Rivers. https://www.epa.gov/system/files/documents/2021-08/tmdl-columbia-snake-temperature-appendix-a.pdf

uses, including but not limited to, conditions in fish bypass systems of the dam.

2. *The Permittee must provide the scope of the WQAP to Ecology for review one year after the permit effective date.*
3. *The Permittee must provide the final WQAP to Ecology for approval within 2 years of the permit effective date.*

(d) The Permittee must submit a progress report to Ecology for approval in year 6. The Permittee must submit a summary report to Ecology for approval 9 years after the original permit effective date and prior to the end of the ten year dam compliance period.

(e) Ecology reserves the right to modify this Certification to incorporate additional compliance schedules for purposes of meeting the WQAP and applicable water quality criteria. (RCW 90.48.080 and WAC 173-201A0510(5).

These provisions from the Washington WQC provide for developing a strategy and implementation of strategies for improving water temperature as to what Oregon is seeking and would provide sufficient protection for Oregon's water quality. First, the WQC states that the Corps "must implement temperature control strategies and meet the load allocations in the Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load." This is the same TMDL that is applicable for Oregon, and the two states are currently working on their implementation plans for the TMDL. Presumably, if there are any strategies available to the Corps that may prove to be beneficial to water temperature that the Corps would be required to implement, it would improve both Washington and Oregon water quality.

Similarly, the Washington WQC directs the Corps to prepare a WQAP, which "must include a detailed strategy for achieving Washington's water quality standards for temperature and associated designated uses, including but not limited to, conditions in fish bypass systems of the dam." Since the WQAP already includes developing a range of strategies for achieving Washington's more stringent standards, the addition of a condition for a similar study for Oregon is unnecessary and duplicative. Nor is a study a proper condition under CWA § 401(a)(2). In § 401(a)(2), Congress provided an avenue for states to request changes that result in on-the-ground effects— "compliance with applicable water quality requirements." Congress did not permit States to commandeer agency resources to conduct studies the States deem desirable, particularly when the requested study does not relate to the "discharges" at issue in the permits. If Oregon desires a specific study and deems it important, it is free to spend its own time and resources to perform (or commission) the study.

In addition, the WQAP is due within 2 years of the permit issuance, with progress reports to follow. Oregon has requested a one-year timeline for its proposed condition, but that is unreasonable as they are also working on implementation plans for the TMDL that they want the Corps to try to meet. Additionally, a two-year timeline to plan

strategies for meeting the water quality standards is reasonable for the scope of the action and would allow the Corps to begin the extensive monitoring requirements in the NPDES permit while also making progress on the WQAP. The scope of this plan could include operations like the specific one that Oregon is requesting (even though, as detailed below, it is not beneficial to river temperatures).

2. **Is it necessary for EPA to include any or all aspects of Oregon's example condition described above to meet Oregon's water quality requirements for temperature? If so, which aspects of the example condition are necessary to ensure compliance with Oregon's water quality requirements for temperature, and why?**

While the EPA public notice included a summarized version of the proposed condition from Oregon, the October 8, 2021 objection letter from ODEQ contained the following proposed condition for inclusion in the permit, and we include it here for context in our comments:

I. Initial Study of Temperature.

Impacts of Facility Operations. Within the first year of receipt of the NPDES permit for the Bonneville Project USACE shall study alternatives actions to reduce thermal loading resulting from the operation of the facility. The study shall focus particularly on water temperatures during the period from July 15 to September 30, but also shall include analysis for other times of the year that are during key periods of salmonid migration. Such actions must include, but are not limited to, changes in operating pools during this period (limited by minimum operating pool). USACE must submit the results of that analysis to EPA, Washington Ecology, and Oregon DEQ within this one-year period. With regard to changes in operating pools, the study shall include, but is not limited to, the following components:

A. An estimate of how much the surface area of the reservoir would change when operating the reservoir at the Minimum Operating Pool;
B. An analysis of how the reduction in surface area and reduction of water residence time in the reservoir would affect discharge temperatures;
C. An analysis of the extent to which changes in reservoir pool elevations would affect the frequency, duration, and magnitude of state water quality standards exceedances in the lower Columbia River; and
D. An analysis of operational tradeoffs resulting from lower operating pools, and whether such changes would significantly impair other goals, including, but not limited to:

i. The ability of USACE to meet operational needs for congressionally authorized purposes.
ii. The potential effects of such changes on USACE's ability to meet other federal requirements, including requirements under the federal Endangered Species Act for spill.

II. Development and Submission of an Implementation Plan. Within one year of submitting the Initial Study of Temperature Impacts, USACE must develop and submit to EPA the Washington Department of Ecology and Oregon DEQ an implementation plan (for EPA's review and approval). The Implementation plan must include a timeframe and milestones for implementing actions that EPA, Washington Ecology and Oregon DEQ have agreed will provide substantial improvements to the thermal conditions without impairing other requirements that USACE must meet in operating the facility. The Implementation Plan must include:
a. Provision for adequate monitoring of water temperature over the term of the permit.
b. Provisions for evaluating the thermal benefits achieved and any resultant effects from the change in operations.

III. Following EPA review and approval, USACE will carry out the implementation plan, and will provide regular reporting to EPA, Washington Ecology and Oregon DEQ regarding changes in thermal loading resulting from the plan.

This proposed condition, or any portion of the proposed condition, is not necessary for EPA to include in the NPDES permits to meet Oregon's water quality requirements for temperature. As mentioned in the response to EPA's first question, the permits already ensure the cooling water discharges from the dams comply with Oregon's water quality standards, including for temperature. Further, as described above, the requirements included in the draft NPDES permits will ensure the point source discharges comply with Oregon's water quality requirements. Oregon's objection does not establish otherwise. Oregon instead improperly focuses its conditions on addressing purported temperature effects arising from other factors, like Oregon's forestry and land-use practices that reduce riparian vegetation and otherwise increase river temperatures, agricultural runoff and non-point source discharges into the rivers, ongoing effects of global climate change, Congress' decision to authorize and construct various mainstem dams, and so on. Additionally, the Washington WQCs already requires the Corps to study and implement strategies to improve water temperature for meeting the TMDL, which makes Oregon's proposed condition duplicative.

Because ODEQ focuses specifically on the MOP operation, we address that one in more detail. First, the MOP condition that Oregon is requesting is vague and does not provide EPA or the Corps with enough specificity on what Oregon would be seeking to be added as a permit condition. Oregon has requested a similar operation in

previous court filings that identified a lower elevation for MOP than what the Corps considers to be MOP for our lower Columbia River projects. The objection letter did not specify the MOP elevations that Oregon is asking to be considered. Without specifying MOP elevations, Oregon cannot even evaluate the effects of the proposed MOP operation on any biotic or abiotic resource or condition, much less demonstrate the effectiveness of such a hypothetical operation on reducing temperatures. Nor did they provide sufficient justification for the dates that are provided in the proposed condition. The letter first identifies the July 15 to September 30 time frame, but then also states that the study shall include other times of the year that are during key periods of salmonid migration, which, depending on what Oregon intends with this language, could be potentially a large portion of the year. However, since this objection is focused on temperature impacts, it is not reasonable to expand a study to periods of time during the year where higher water temperatures are not a concern. Therefore, expanding the time frame of the study to "key periods of salmon migration" admits that Oregon is more focused on salmonids than addressing the dams' effects of temperature as many of the key periods of salmon migration are not during times of year that temperatures in the river exceed water quality requirements. Congress did not state in § 401(a)(2) that Oregon (or EPA) is provided a vehicle to broadly regulate the Corps' dams to achieve goals untethered to the specific discharges and water quality requirements at issue under the permits.

Oregon's speculation that some positive impact on reach temperatures from running the dams at MOP is just that—unsupported speculation not based on scientific or engineering analysis. The Corps found through its Columbia River System Operations (CRSO) Environmental Impact Statement (EIS) analysis that breaching the lower Snake River dams would result in more frequent exceedances of temperature criteria. Oregon has provided no contrary evidence. This highlights that any new temperature related operations imposed through the NPDES permit should be considered only with robust technical analysis. The Corps currently engages in operations at headwater, storage reservoirs to influence Columbia River System (CRS) water temperature through cold water releases during the summer months. Mainstream, run-of-river reservoir temperature management is limited in comparison to headwater storage reservoir releases and focuses more on reducing water temperature gradients within fish ladders. For example, at Lower Granite and Little Goose Dams, pumps in the forebay inject cooler water from depth into the upper sections of the ladders to help equilibrate water temperature in the ladders to tailwater temperature as the surface water warms during hot weather. Similar actions to reduce temperature gradients in fish ladders that may delay upstream adult fish passage are being investigated at other dams, including John Day Dam. The water temperature of the lower Snake and Columbia River is monitored and reported in real-time using a network of approximately 143 sensors in the tailraces, forebays, and fish ladders of the projects. This data is used to evaluate in season operations and is the basis for planning studies, such the TMDL and CRSO EIS. Oregon does not appear to have considered any of this evidence.

In preparation for EPA's hearing on Oregon's objection letter, Corps water quality staff modeled the temperature effects of a lower Columbia River MOP operation using the elevations that Oregon previously presented in their motion for preliminary injunction[3] (PI) in the *NWF et al. v. NMFS et al*. (3:01-cv-00640-SI) litigation[4] and identified no detectable temperature benefits/changes (see Appendix 1). River temperatures at each of the dams' tailwaters and at the Oregon state border were greater than the Oregon water quality standard of 20 deg. C (68 deg. F) as a 7-day average of the daily maximum (7-DADM) under both the normal operating range and the proposed MOP operation scenarios. Under the proposed MOP operation scenario, hourly river temperatures were both warmer and cooler, but overall, was predicted to change only a negligible amount when compared to the normal operating range, as determined using the same methodology as the CRSO EIS (i.e., <0.4 °F seasonal change in maximum / minimum temperature).

Temperature dynamics are complex. Inflowing temperature has the biggest impact on temperature in the tailwater. The Columbia River commonly exceeds the Oregon criteria upstream of Oregon. At the four lower Columbia River dams, the predicted impact of the MOP operation is less than measurement error (~0.3 deg C) and model uncertainty (see CRSO Final EIS (Appendix D, Annex A) for discussion of uncertainty). In other words, the impact of the MOP operation is predicted to be so subtle that the model cannot accurately discern its impact given the variability of other factors (e.g., flow and meteorology) and the necessary simplification of hydraulics and the heat. The modeling results show at most only negligible changes to river temperatures co-occurring with changes to reservoir elevations, which provides evidence that this type of dam operation is not the cause of temperature fluctuations that could be found to exceed Oregon's water quality standards.

Based on the modeling results, the Corps is confident that the specific operation that Oregon is requesting in its proposed supplemental condition will not result in any temperature benefits. Nor has Oregon provided any evidence of the effects of its proposed operations, let alone evidence that contradicts the Corps' evidence. And Oregon chose not to address the substantial negative impacts on many other operations and resources it is entrusted to safeguard through its regulatory actions, including salmon and steelhead listed under the ESA. The evidence instead shows that

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[3] It should be noted that the Corps does not agree that the elevations presented in Oregon's previous motion for preliminary injunction in the *NWF et al. v. NMFS et al.* (3:01-cv-00640-SI) litigation are those that the Corps considers to be MOP at the LCR projects. However, for purposes of the modeling and due to the lack of specificity in the Oregon objection letter as to elevations of a MOP operation, Corps staff used the lower elevations that Oregon used in their motion for preliminary injunction based on the assumption that those elevations would have the largest potential for an impact, if any, to temperatures.

[4] The *NWF et al. v. NMFS et al.* (3:01-cv-00640-SI) litigation is the long-running challenge under the Endangered Species Act to the biological opinions on the continued operation and maintenance of the Columbia River System. The current iteration of the litigation also challenges the Columbia River System Operations Environmental Impact Statement and Record of Decision, signed by the Corps, Bureau of Reclamation, and Bonneville Power Administration. Oregon is a plaintiff in that litigation, and the Corps is one of the federal defendants.

Oregon is asking EPA to adopt conditions that would prevent the Corps from fulfilling its authorized purposes, including the protection of tribal and ESA-listed resources.

Fish Impacts

Both Oregon and EPA must ensure, in consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS), that any proposed regulatory permit conditions appropriately safeguard ESA-listed species and otherwise comply with the ESA. Oregon's proposed conditions do not comply with these requirements. The adverse impacts to fish that could be expected from a MOP operation described above includes effects to both adult and juvenile fish passage. Oregon's proposed MOP operation would result in decreased flow rates in adult fish ladders, reduced water depth at fish ladder exits, and reduced water depth/reduced attraction flow at ladder entrances, which would make it more difficult for adult fish to locate the ladders and ultimately delay or block upstream adult fish passage. Forebay elevation impacts the flow rate in the fish ladder (i.e., lower forebay elevations result in less flow in the fish ladder). At McNary and John Day dams, decreases in fish ladder flow from lowering the forebay would require more flow compensation through existing auxiliary pumps increasing the risk of pump failure and major fish ladder disruption.

Adequate depth at fish ladder exits is dependent on the forebay elevation. At Bonneville Dam, the Bradford Island and Washington Shore fish ladders exit into shallow basins under current forebay operating ranges. Oregon's proposed MOP operations will decrease water depth even more (generally by several feet), which may delay adult fish passage as fish exit the fish ladders into the forebay. At The Dalles, John Day and McNary dams it is uncertain how lower flows at the fish ladder exits will impact migrating adults, but Corps biologists anticipate an overall negative effect on fish ladder performance. Entrances to fish ladders in the tailwater of each project require a minimum depth of water over the entrance sill to effectively attract and pass adult fish. This depth is largely dependent on the next downstream project's forebay elevation. Additionally, the fish ladders entrances also have differential[5] criteria, which is a hydraulically controlled change in water surface, necessary for fish attraction. Lower ladder entrance depths will reduce attraction flow and make it more difficult for adult fish to locate the ladders, potentially slowing or halting adult fish passage. Under this type of MOP operation, the Corps will most likely not be able to meet minimum tailwater requirements in the late summer because of low flows combined with the low pool at McNary and John Day dams.

The anticipated impacts to juvenile fish passage are numerous. There would be reduced attraction flow to important juvenile fish passage routes including surface passage structures (Bonneville Ice and Trash Sluiceway, Bonneville Corner Collector,

[5] The differential in the fish ladder refers to the elevation of the water surface inside the ladder relative to the tailwater elevation outside the ladder. Ladder differentials are impacted by flow within the ladder, weir height and tailwater elevation.

The Dalles Ice and Trash Sluiceway and spillbay weirs at McNary and John Day dams). The Corps expects that the flow reduction would result in a corresponding reduction of fish using these high survival routes and would potentially shift fish passage to turbines. Also, there are structural concerns for important infrastructure such as The Dalles spillwall.

The Bonneville Dam Ice and Trash Sluiceway (ITS) at Powerhouse I would be operating significantly under criteria (with less than 1-foot of depth for attraction as compared to the preferred 2-3 ft of depth) if operated at Oregon's MOP elevation. A decrease in functionality of the ITS will likely increase turbine passage for juveniles. Entrance depth at The Dalles ITS would be decreased, potentially impacting attraction into the powerhouse juvenile passage route. Other surface passage structures (McNary and John Day spillway weirs and Bonneville corner collector) would have less water passing through them, thus reducing their effectiveness at attracting and at passing fish. Bypass systems at these projects would also have reduced head and thus less flow and depth and significantly degraded functionality.

The Dalles Dam spillwall was added in 2010 to provide better egress conditions for juvenile fish passing via the spillway. Prior to the spillwall construction, juveniles could be pushed into shallow areas where they were subject to predation. The spillwall directs juveniles into the main river channel speeding their migration downstream and minimizing predation. Spill for juvenile fish passage is generally limited to bays 1-8 (northernmost bays) to take advantage of improved egress conditions. The structure was designed assuming normal forebay and tailwater levels. The low forebay requested by Oregon in their motion for PI at Bonneville would create high velocities, over 20 fps that are outside the design criteria for the facility and could lead to a structural failure of the spillwall. To meet the 40% spill requirement and maintain safe velocities for the spillwall structure, a limited amount of spill would be released through the preferential bays 1-8 (north of the spillwall) and the remainder of spill would be released outside the spillwall, which is historically associated with poor juvenile egress conditions and predation. Corps staff estimates that with the Bonneville forebay at 70 ft, approximately 90% of the spill at The Dalles would go north of the spillwall and 10% would be south of the spillwall. Juvenile fish passing south of the spillwall will be directed into shallow islands immediately downstream of the spillway where they are heavily preyed on by predatory fish and birds.

NMFS has also expressed concerns over how substantially lower reservoir elevations could affect fish passage. Additionally, Oregon's proposed operations are likely to affect resources managed or regulated by the USFWS, including water supply at hatcheries and refuges, and increased avian predation due to the MOP operation. Water supply at hatcheries and refuges may be impacted by Oregon's proposed MOP operation in the lower Columbia River as the water elevation would be below the effective ranges of the pumps that these facilities or refuges rely on for their water. The

USFWS has also identified a concern that lower reservoir elevations could increase avian predation on species listed under the Endangered Species Act (ESA). This is because there would be increased habitat available for avian predators due to the lower elevation of the reservoir exposing more land for these predators to use for nesting. This would be counter to the actions that the agencies are currently undertaking to reduce avian predation occurring in the lower Columbia River by reducing the available nesting habitat in key areas.

Tribal Concerns and Impacts to Cultural Resources

The proposed MOP operation has implications to tribal fishing, cultural sites and hatchery operations. It appears that Oregon has failed to consider or provide evidence on the impacts to cultural resources from the requested operation at MOP on the lower Columbia River, and evidence suggests these impacts are substantial. Above McNary Dam on Lake Wallula the decrease in forebay elevation has the potential to expose multiple cultural resource properties (estimated to be at least 150 sites). The effects on cultural property types such as archaeological sites and tribal Traditional Cultural Properties, including human-burial locations, would include damage from erosion and increased exposure. The lower reservoir elevation would provide more opportunities for access to sensitive sites, potentially leading to looting of important archaeological sites and human-burial locations. This threat to the same types of cultural resources also exists at Bonneville, The Dalles and John Day reservoirs.

Additionally, the low pool operations may have impacts on tribal fishing in the lower Columbia reservoirs including the Treaty Fishing Access Sites with greatest impact on tribal fishing platforms. The operation that Oregon is seeking potentially interferes with hatchery and water supply for the Confederated Tribes of the Umatilla Indian Reservation through the requested MOP operations, and EPA should not grant the permit with conditions without first obtaining evidence that Tribal rights and equities are secure and protected. EPA and Oregon should consult with the tribes on any changes in operations prior to adding conditions to the NPDES permits.

Impacts to Navigation

The proposed MOP operation from Oregon could result in shallow areas downstream of The Dalles navigation lock that do not meet federal navigation requirements of 14 feet. This would impact navigators and result in barge groundings below The Dalles Dam, harming human health and safety and impacting shipping on the Columbia and Snake rivers.

Impacts to Water Supply

Irrigation and municipal and industrial water supply will be affected by the proposed MOP operations in the lower Columbia River reservoirs. Reservoirs that are drawn down below normal historic levels are expected to be out of operating criteria for

many irrigation pumps, especially along the John Day reservoir, which has a well-established minimum irrigation pool at 262.5 feet.

Similarly, the lower pool levels could impact important municipal water supply and drinking water for citizens living along the Columbia River, many of them State of Oregon citizens, and would need to be investigated before implementing an operation such as Oregon's proposed MOP operation. The Corps has not yet assessed the number of irrigators or municipal water supply users that would be affected, and such a study would require extensive research that would likely not be accomplished in the timeframe requested by Oregon's proposed condition.

As detailed above, Oregon's objection is beyond the scope of Section 401(a)(2) and the requirements included in the draft NPDES permits will sufficiently ensure the discharges comply with Oregon's water quality requirements. Additionally, the Washington 401 WQCs already requires the Corps to study and implement strategies to improve water temperature. The difference between ODEQ's vaguely constructed proposed condition and the WQCs is ODEQ's specification of the MOP operation, which, as explained above, is duplicative, would not benefit river temperatures, and would negatively impact many different resources in the lower Columbia River. Therefore, ODEQ's proposed condition, or any portion of the proposed condition, is not necessary for EPA to include in the NPDES permits to meet Oregon's water quality requirements for temperature. And EPA should not accept Oregon's proposal to adopt permit conditions intended to degrade the function of federal dams based only on speculation and guesswork, not evidence that the proposed conditions will address effects of discharges regulated under the CWA, much less improve river temperature, protect tribal rights and resources, safeguard human health and safety, ensure the protection of ESA-listed resources, or satisfy other legal and moral obligations when regulating Federal dams that impact Oregon's residents and the State's natural resources.

3. As an alternative to Oregon's example condition, what permit conditions would ensure that Oregon's water quality requirements for temperature are met?

As stated in the Corps' response to EPA's questions 1 and 2, which are fully incorporated by reference in response to this question, the Corps does not believe that any additional permit conditions are required to ensure that dam discharges comply with Oregon's water quality requirements. The requirements included in the draft NPDES permits will sufficiently ensure the discharges at issue comply with Oregon's water quality requirements. Further, the WQCs require the Corps to study and implement strategies for meeting Washington's more stringent standards, which will in turn also provide sufficient assurance that the discharges at issue comply with Oregon's requirements.

4. Are there other conditions EPA should consider in the draft permits to meet Oregon's water quality requirements for temperature?

Again, as detailed in the Corps' responses to questions 1, 2, and 3, and fully incorporated by reference here, the Corps does not believe that EPA should add any other conditions into the draft permits to ensure the Corps' discharges at issue meet Oregon's water quality requirements for temperature. The requirements included in the draft NPDES permits will sufficiently ensure the discharges at issue comply with Oregon's water quality requirements. Further, the WQC requires the Corps to study and implement strategies for meeting Washington's more stringent standards, which will in turn also provide sufficient assurance that Oregon's requirements will be met.

Additional Information for EPA's Consideration

To the extent Oregon (or EPA) view the proposed conditions as requirements for study only, or that future action is at best contingent on the outcomes of the study and off-ramps agreed to by the State or EPA, then the conditions are unlawful. CWA § 401(a)(2) does not allow the State or EPA to impose conditions for studying problems or requiring agencies to pursue a path that might in the future require the agencies to implement some as of yet unidentified action. The CWA imposes a high standard on conditioning permits, allowing a state to propose and EPA to grant the permits with narrowly tailored conditions that evidence shows are "necessary" to achieve a defined, specific substantive result—ensuring the discharges at issue comply with the State water quality requirements. If Oregon (or EPA) cannot demonstrate that the conditions are necessary or will produce the desired result, the conditions are not appropriate under the CWA.

On the other hand, if Oregon is proposing conditions that require a new dam operation (like some variant of a MOP operation), EPA cannot grant the permit with conditions unless it independently satisfies the applicable requirements of the ESA, including those in Section 7(a)(2) and Section 9 of the ESA, 16 U.S.C. §§ 1536, 1538. The Corps has ensured that its current operations comply with the ESA. But if EPA mandates that the Corps alter those operations, EPA must satisfy its ESA obligations *before* it grants the permit with the conditions requiring allegedly "necessary" changes to dam operations. Such operations are likely to have significant adverse consequences to ESA-listed species as set forth above. In this situation, EPA must: (1) define the proposed permit condition with enough specificity to enable an effects assessment, 50 C.F.R. § 402.14(c); (2) consult with NMFS and USFWS at the soonest practicable time, before it grants the permit with the conditions, 50 C.F.R. § 402.14; (3) work with the Corps—the "applicant"—to obtain relevant information and data for consideration during the consultation, 50 C.F.R. § 402.14(c)(1)(iii), (iv). (d); (4) ensure the remaining statutory and regulatory ESA requirements are fully satisfied prior to granting the permit; and (5) reinitiate ESA consultation when required.

Conclusion

The Corps appreciates the opportunity to submit these comments in response to the questions that EPA posted as part of the public notice. As stated above, the Corps does not believe that an additional condition in the NPDES permit is necessary and is instead duplicative and out of scope of the NPDES permit. As always, we welcome the opportunity to further discuss these comments with EPA. Please contact me if you have any questions on these comments.

Sincerely,

Frances E. Coffey, SES
Director, Programs

Enclosure

Electronic Copies Provided:
Jenny Wu, EPA

United States Department of the Interior

BUREAU OF RECLAMATION
1150 North Curtis Road
Boise, ID 83706-1234

IN REPLY REFER TO:
CPN-6520
2.1.4.13

VIA ELECTRONIC MAIL ONLY

Ms. Jennifer Wu
NPDES Permits Section
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 155 (19-CO4)
Seattle, WA 98101-3188
wu.jennifer@epa.gov

Subject: Bureau of Reclamation Comments for Public Hearing on Proposed Discharge Permits for Federal Hydroelectric Projects in the Lower Columbia River

Dear Ms. Wu:

Reclamation appreciates the opportunity to comment and looks forward to the discussion arising from the Environmental Protection Agency's (EPA) public comment process. Reclamation here shares perspective on how permit requirements at the Lower Columbia River (LCR) dams, particularly as those conditions relate to minimum operating pool (MOP), may have broader system wide impacts. As EPA, Oregon Department of Environmental Quality (ODEQ), and the Washington Department of Ecology are all aware, the Federal Columbia River System is a carefully managed and highly constrained system, always aiming to store and release water at just the right times to serve multiple objectives, including supporting the needs of Endangered Species Act-listed species consistent with the 2020 National Oceanic and Atmospheric Administration and U.S. Fish and Wildlife Service Biological Opinions. Alterations of operations at one project have the potential to impact other facilities in the system that may conflict with current operating plans. Some changes to operation of a single project can require every facility on the Columbia River to adjust operations. Any proposed studies or permit actions thus need to be unambiguously defined, so that effects can be measured and quantified for the whole system.

The example study proposed by ODEQ—a study of minimum operating pool at Bonneville, The Dalles, John Day, and McNary and associated impacts to temperature in those associated reservoir—would influence a wide array of operations and facilities outside of the permitted facilities referenced in the objection. Operating the 4 LCR facilities at MOP would impact flexibility for upstream flood risk management as well as power generation as inflows to McNary would have to be carefully restricted to a narrow range to maintain MOP at all 4 facilities. This restriction on total combined flow from both the lower Snake and the upper Columbia would impact facilities well outside of those covered by Oregon's 401 interests in this proceeding. Irrigation pumps in the lower Columbia River reservoirs also could be dewatered at

MOP, in turn impacting withdrawal and irrigation return flow rates, further complicating upstream management to maintain MOP and potentially exacerbating water temperature conditions in the lower Columbia River and its tributaries. Operations proposed by Oregon at lower elevations may have adverse effects on the effectiveness of fish operations, both downstream and upstream operations that benefit migratory species, which are either listed as threatened or endangered under the Endangered Species Act or a species of regional importance such as lamprey that are a ceremonial food source for Native American tribes in the Pacific Northwest. Recognizing that MOP may not be the only operation ODEQ has in mind for potential conditions to study, Reclamation urges that any permit conditions arising from this proceeding account for and mitigate impacts to other reaches of the Columbia River.

Thank you once again for this opportunity to provide comment. For additional information, please contact Cavan Gerrish, Regional Water Quality Coordinator, at (208) 378-5347 or cgerrish@usbr.gov.

Sincerely,

Jennifer J. Carrington
Regional Director