US Army Corps of Engineers, Attn: CRSO EIS
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To: CRSO EIS Administrative Record

On Friday, February 28, 2020, the U.S. Army Corps of Engineers (USACE), Bureau of Reclamation (BoR), and Bonneville Power Administration (BPA) released the Draft Environmental Impact Statement (DEIS) for Columbia River System Operations.¹,² ECONorthwest appreciates the detailed analysis that the managing federal agencies conducted as required by the National Environmental Protection Act. Upon our review of the DEIS, however, we identified eight key points that we would like to see further addressed in the Final Environmental Impact Statement (FEIS). This letter highlights those eight key points and is supported by our previous independent analysis of the economic tradeoffs of removal of the four Lower Snake River Dams. Our report is submitted as an attachment to this letter.

ECONorthwest was retained by Vulcan Inc. to produce the original report and to review the DEIS. ECONorthwest is responsible for the content of this letter and the attached report. Neither Vulcan nor ECONorthwest have any stake or opinion in the selection of the preferred alternative in the FEIS. ECONorthwest is submitting this formal comment to ensure that the analysis conducted by the managing federal agencies meets the highest standards of technical and methodological rigor.

About ECONorthwest

ECONorthwest is the northwest United States’ most comprehensive independently-owned economics consulting firm. Formed in 1974, it has a long history of employing sound analytical methods to successfully complete projects for private and public clients across the U.S. and the world. ECONorthwest has earned a national reputation for rigorous and often pioneering policy analysis, especially on public policies affecting the allocation and use of natural resources. Our clients include federal agencies, attorneys, and coalitions of local governments.


² Throughout the remainder of this cover letter the Draft Environmental Impact Statement (DEIS) will be referenced with the page number and line number(s) as “DEIS, page number, line number”.

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and organizations working to integrate multiple priorities. We incorporate sensitivity into procedural issues and routinely work with advisory groups and the public to ensure that our recommendations are technically correct, institutionally feasible, and politically realistic.

Findings From our Review of the DEIS

We highlight eight key points that we feel require further consideration in the issuance of the FEIS below.

1. The DEIS does not properly consider the costs of a replacement power portfolio

The Lower Snake River Dams produce a small share of the energy needs for the region and account for less power than BPA currently exports to other regions, primarily California. While the dams add useful capacity to ensure system reliability during certain months of the year, those capacity services could be provided by other resources at a relatively low cost.

The DEIS assumptions result in a higher estimate of rate pressure outcomes associated with dam removal compared to prior studies. The DEIS estimates rate increases of 9.6 percent to 19.3 percent, depending on the replacement portfolio. In contrast, The Lower Snake River Dams Power Replacement Study, authored by Energy Strategies for the Northwest Energy Coalition found that the increase in the regional revenue requirement would be two to three percent higher after removal of the dams. Although the DEIS comments that the difference is because the Energy Strategies report has “older load data and natural gas price forecasts, has lower estimates for transmission-related costs, and therefore underestimates impacts to Bonneville ratepayers”, the large difference suggests that the DEIS is using an unnecessarily high estimate for rate impacts that does not prioritize cost savings.

Furthermore, the estimates of grid reliability in the DEIS greatly exceed current market estimates of those resources. In their 2018 study, Energy Strategies ran a simulation of the Pacific Northwest grid without the LSRD and noted how the loss of load probability changed for each month. Removing the LSRD increases the loss of load probability over one percent for four months: September, October, December, and January. While no formal market exists for this reliability service in the Pacific Northwest, California utilities are required to contract for “resource adequacy”. Applying the price of adequacy contracts in California of approximately $4.34 per kW per month to the 1,000 MW operating capacity for the four months during which

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4 DEIS, page 3-920, lines 27784-27785.


6 DEIS, page 3-913, lines 27526-27528.


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the LSRD are needed to provide regional reliability sums to $17.4 million per year. This is substantially lower than the DEIS’s estimate of $82 million to $371 million per year.\(^8\) The DEIS’s reliance on the construction of new infrastructure ignores the true market price of these services and indicates that the DEIS’s cost estimates are likely overstated.

2. The DEIS does not fully account for the market value of foregone power

Any reduction in generating load at any of the four Lower Snake River Dams results in an operating cost borne by BPA. This decrease in load can occur naturally through a reduction in river flow, anthropogenically through increased spill over the dams to enhance downstream fish passage, or artificially through oversupply events to manage total dissolved gas levels below the dams.

The DEIS prices the oversupply events using a value of $29.22 per MWh which represents the “average historical price paid to generators displaced for FY2012–FY2019”.\(^9\) Although this price is a function of negotiated contracted rates, it does not reflect the market conditions for surplus power generated from (or needed by) the BPA power grid. These negotiated rates are a function of BPA’s substantial market power in the region. As a federal managing agency, evaluation of the gains or losses from different operating regimes should not rely on BPA’s role as a regulated natural monopoly to identify public benefits and costs, but rather objective indications of the true market value of its services and resources.

Fortunately, a market for the exchange of regional power does exist, in the form of the Mid-Columbia trading hub of the Inter-Continental Exchange (ICE). A comparison of BPA’s negotiated rates and those posted on the ICE show that market conditions result in generally lower values of power when spill occurs in the spring due to excess capacity in the system from spring runoff.\(^10\), \(^11\) The DEIS itself references how market prices for power at the Mid-Columbia trading hub vary throughout the year depending on “streamflow, generation, demand, and market factors”.\(^12\)

The DEIS’s reliance on negotiated rates is an insufficient measure of the value because it does not account for the lowest cost alternative of purchasing the power on the open market to replace the power lost from the spill. The Bonneville negotiated rate of $29.22 is higher than Mid-Columbia trading hub rates of “$21.02 per MWh for heavy load hours and $16.66 per MWh for light load hours (2019 dollars).”\(^13\) This price differential demonstrates the misleading estimates that can potentially result from not using a market-based rate to value the cost of increased spill in the alternatives.

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\(^8\) DEIS, page 3-924, lines 27925-27926 and DEIS, page 3-925, lines 27932-27933.
\(^9\) DEIS, page 3-838, lines 25559-25562.
\(^10\) ECONorthwest. (2019). *Lower Snake River Dams Economic Tradeoffs of Removal.* July. Figure 3.
\(^11\) DEIS page 3-851, Figure 3-175.
\(^12\) DEIS page 3-851, lines 25922-25923.
\(^13\) DEIS page 3-851, lines 25920-25921.
3. The DEIS performs an insufficient accounting of the greenhouse gas implications of alternatives

The electric power sector is the second largest source of CO₂-equivalent emissions in the United States.¹⁴ Any changes in the power-generating grid can have potentially significant implications for CO₂ emissions, as well as resulting climate change impacts. Identification of the socially-optimal alternative must consider both the upfront costs of power generation, as well as the resulting social costs of carbon emissions. This evaluation can be conducted two ways: 1) evaluate the cost of a fully renewable power generation portfolio, or 2) calculate the social value of the associated increased GHG emissions using the existing mix of new power generating sources coming online. The DEIS does an insufficient job of evaluating either.

The DEIS asserts that during peak demand there would not be sufficient capacity to meet demand in the zero-carbon resource portfolio without fossil fuel generation.¹⁵ This assumption ignores the possibility of structural changes that would allow for peak-demand to be met with renewable resources. The finding that coal emissions would increase by one percent more in the “zero-carbon replacement portfolio” (eight percent) compared to the “conventional least-cost resource replacement portfolio” (seven percent) demonstrates that the resource mix chosen for the zero-carbon replacement portfolio is not structured for the lowest carbon emissions.¹⁶

If the DEIS did select a portfolio that was truly zero-carbon, it would be possible to meet GHG emissions objectives while also removing the four Lower Snake River dams. Although this may be accomplished at a higher cost, it may still create a socially optimal alternative by offsetting the social costs of increased CO₂ emissions.

The DEIS also does not comprehensively consider all of the available options for reducing electricity use. Although demand incentives are referenced, there is limited mention of energy efficiency incentives for private industries or similar options. The “zero-carbon” portfolio selects only “the lowest-cost carbon-free resources (e.g., solar, wind, or non-generating tools such as demand response)”¹⁷. The analysis artificially constrains the options available by not including higher cost resources to reduce emissions that would allow for zero increases in GHG emissions under MO3.

4. The DEIS does not fully evaluate the cost of replacement irrigation infrastructure

The DEIS’s approach to irrigation relies on the assumption that costs are “prohibitive” to modify the existing pump system for the Ice Harbor Reservoir.¹⁸ By not attempting to evaluate the cost of pump modifications, the analysis does not have sufficient information to state that

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¹⁵ DEIS, page 3-1010, footnote 19.

¹⁶ DEIS, page 3-1010, lines 30404-30413.

¹⁷ DEIS, page 3-820, lines 25028-25030.

¹⁸ DEIS page 3-1267, lines 3246-3247.
“all irrigated acres receiving water from the current pumps would no longer be irrigated”. The DEIS assumes that all irrigated lands would no longer be irrigated and estimates the lost agricultural land value resulting from that change. Labeling costs as “prohibitive” would generally require some cost-estimation to indicate that they would not occur under existing market conditions. The DEIS does not independently conduct such analysis.

Our report [attached] relied on a mitigation approach to identify the costs of dam removal to existing irrigators. This approach yields an estimate of $160 million in infrastructure adaptation surface water and groundwater costs. This is a substantially lower estimate than the $331 million to $458 million in lost irrigation value in the DEIS, and certainly not prohibitive.

The DEIS also does not fully consider alternative water supply sources, such as the transition from surface water to groundwater sources, or obtaining water from the Columbia River rather than the Snake River. The DEIS references that the 2002 EIS suggested this possibility because the 2002 EIS “assumed that 21 percent of the irrigated land might support the development of alternative water supplies to replace lost irrigation water”. However, the current DEIS does not provide a sufficient explanation for why these alternatives were not evaluated.

5. The DEIS does not appropriately estimate the increase in transportation costs resulting from the alternatives

The Lower Snake River serves as a transportation corridor, enabled by the lock system operated at each of the four dams. Shippers in the region have multiple transportation mode alternatives in addition to the river, including rail and truck transportation. Given existing market conditions, it can be assumed that shippers are choosing the optimal mode for their goods based on price, timeliness, and reliability. Any shift in transportation mode as a result of the alternatives is likely to affect existing shippers in at least one of those three dimensions. Those resulting mode changes can impose public costs as well. The DEIS, however, fails to properly account for the full mix of private and public costs associated with the alternatives, for the following four reasons:

- The DEIS relies on a stakeholder survey conducted by the Social and Economic Sciences Research Center (SESRC) at Washington State University referenced in Appendix L. However, neither the survey nor associated response data are provided in the DEIS supporting materials, making it difficult to evaluate the appropriateness of the survey instrument or methodology.
- The DEIS does not provide sufficient information to estimate the expected increases in transportation costs. The transportation analysis relies on assumptions about how much rail rates would increase, using zero, 25 percent, and 50 percent increases in rail rates as

19 DEIS, page 3-1267, lines 3252-3253.
21 DEIS, page 3-1259, lines 2959-2962.
22 DEIS, page 3-1267, lines 3248-3250.
23 DEIS, Appendix L, page L-3-3, lines 179-185.
arbitrary assumptions. As acknowledged in the DEIS, rail rates increased by 35 to 40 percent during historical lock closures. However, these represent short term costs without any increase in rail capacity, and thus likely serve as upper bounds.

- The DEIS does not clearly identify net changes in dredging costs. In one section, the DEIS states “Dredging operations are expected to remain similar to the No Action in other reaches of the Columbia navigation channel, with an estimated cost of $67.1 million annually. In total, annual dredging costs would increase about 4.4 percent under MO3, from $70.1 million annually to $73.2 million.” However, in another section, the DEIS states that “Annual navigation costs of approximately $10 million, including $3 million in dredging costs, would no longer be authorized at the four lower Snake River projects under MO3.” These two statements appear contradictory.

- The DEIS fails to consider the true social value of the use of the lower Snake River as transportation infrastructure. As described in our report, “Significant federal appropriations are dedicated to operating transportation infrastructure on the LSRD that are not recovered via the USACE fuel surcharge and are borne by the federal government. A comparison of solely the transportation costs and the federal appropriations indicates that barge transportation along the LSR would not be viable without this subsidy.” The DEIS fails to reference this fact or the cost savings from ceasing federal appropriations for operation of the locks.

6. The DEIS does not properly account for the economic impacts resulting from all spending associated with the alternatives

The DEIS does not fully account for the increase in jobs, labor income, value added, and output that would result from the construction and mitigation spending associated with the various alternatives. Of note, the DEIS acknowledges that removal would be funded by federal appropriations: “An important assumption in the MO3 rate analysis is that the Bonneville would not pay for the cost of dam breaching. Rather, for this EIS, it is assumed that the cost of dam breaching would be covered by congressional appropriations.” However, this increase in economic activity is not clearly accounted for in the DEIS.

The local economic impact of this new spending in the region should be considered, not only for the direct labor and income it supports, but also for how that spending could stay in the local economy and support other jobs.

This deficiency also presents itself in the DEIS’ analysis of transportation costs and is clearly acknowledged: “This estimate does not include potential impacts associated with reduced

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24 DEIS, page 3-1118, lines 33052-33055.
25 DEIS, page 3-1125, lines 33227-33229.
26 DEIS, page 3-1131, lines 33366-33369.
27 DEIS, Appendix Q, page Q-5-4, lines 702-704.
29 DEIS, page 3-918, Footnote 75.
demand for barge employment or an increased demand for trucking employment that would accompany these shifts.”

Similarly, although the DEIS acknowledges that dam breaching could increase recreation in the long term, economic impacts are only estimated for the loss of reservoir recreation and not the potential gain from fishing opportunities or free-flowing river-based recreation.

These fundamental changes in spending patterns should be included, so that the public has a full appreciation of the net change in economic activity as a result of the different alternatives.

7. The DEIS does not properly account for the full suite of benefits stemming from recovery of endangered salmonids in the Columbia and Snake Rivers.

Any accounting of the benefits and costs of the different alternatives must include all relevant types of economic value. This includes direct monetary benefits and costs (i.e. changes in transportation spending, the costs of dam removal, etc.), but must also include non-market values, including the non-use or existence value of restored ecosystems.

Non-use values are measures of the economic tradeoff that an individual is willing to make to assure the protection of a natural resource even if they will not visit or use the resource. These values are not revealed by choices in the marketplace (unlike many local public goods), and must be measured using stated-preference survey-based approaches. Stated preference surveys have questions that help to reveal the monetary tradeoff an individual would make concerning the value of goods or services.

Non-use values serve an important role across a broad set of policy arenas. For example:

- Pennsylvania used contingent valuation in a benefit-cost analysis of additional incarceration versus rehabilitation programs for serious juvenile offenders.
- Non-use value estimates were used to measure the value of developing vaccine policies in Africa.

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30 DEIS, page 3-1142, lines 33700-33702.
• Stated preference surveys have been used to measure the willingness of the U.S. public to pay for climate change measures.37

• Stated preference surveys have been used by state and federal natural resource trustees to estimate natural resource damages in the Exxon Valdez oil spill (1989), Montrose Chemical contamination (2000), Oklahoma v Tyson case (2010), and Deepwater Horizon oil spill (2010).38

• Stated preference surveys have been used to evaluate the benefits of dam removal on the Elwha River39,40 and the Klamath River.41

Federal courts and agencies have also long acknowledged the importance of non-use values, in particular:

• The U.S. Forest Service’s 2012 Planning Rule required that planning activities consider ecosystem services as part of an integrated resource management focus.42

• The White House issued memorandum M-16-01 in 2015, which directed “agencies to develop and institutionalize policies to promote consideration of ecosystem services, where appropriate and practicable, in planning, investments, and regulatory contexts.”43

• DC Circuit Court of Appeals: “option and existence values may represent ‘passive’ use, but they nonetheless reflect utility derived by humans from a resource, and thus, prima facie, ought to be included in a damage assessment.”44

• The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Compensable value includes “all of the public economic values associated with an injured resource, including use values and nonuse values such as option, existence, and bequest values.”45

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42 Federal Register/Vol. 77, No. 68/Monday, April 9, 2012/Rules and Regulations


• National Oceanic and Atmospheric Administration (NOAA): “well conducted CVM studies can produce estimates reliable enough to be the starting point of a judicial process of damage assessment, including lost passive values.”46

• BoR: “The state of the natural environment affects people both in how they use the environment and how they would prefer the environment to be. Thus, both use and non-use values need to be considered when assessing impacts to the human environment.”47

Despite this, the DEIS neglects to directly estimate non-use values. Notably, however, the DEIS does acknowledge their importance and likely broad geographic extent. Specifically, the DEIS states that: “This analysis acknowledges that the general public holds passive use values, and that the population that may experience social welfare benefits from increased salmon populations may be geographically far-reaching.”48

Non-use values are widely accepted in the economic literature and among federal agencies, including an instance where the BoR directly implemented a non-use valuation study to evaluate the benefits of removal of the Lower Klamath Dams. It is clear that the DEIS’s omission of quantified non-use values makes it an insufficient tool to reach conclusions about alternatives.

8. The Preferred Alternative does not maximize benefits associated with endangered species

The DEIS relies on a “scorecard” approach, where alternatives are rated based upon their ability to meet narrowly defined objectives, rather than evaluating the magnitude of differences in outcomes between alternatives. The most detrimental impact of the scorecard approach for comparing alternatives is the failure to account for the significantly higher benefits to anadromous fish species in MO3 compared with all other alternatives. As described in the Executive Summary, “Model estimates for MO3 showed the highest predicted potential smolt-to-adult returns (SARs) for Snake River salmon and steelhead among the alternatives.”49

Specifically, for Snake River salmon and steelhead, SARs would increase by 170 percent relative to the No Action Alternative.50 In contrast, the preferred alternative would increase SARs by approximately 30 percent for Snake River Chinook and steelhead and may actually decrease SARs for Snake River Chinook, depending on which model is used.51

47 Glen Canyon Environmental Impact Statement (1996) USDOI, BOR.
48 DEIS, page 3-1322, lines 5083-5086.
49 DEIS, page 25 of Executive Summary
50 DEIS, page 25 of Executive Summary.
51 DEIS, page 33 of Executive Summary.
The scorecard structure used in the DEIS to evaluate the benefits to anadromous fish is narrow in scope and fundamentally unable to weigh a full suite of benefits and costs. When relative magnitudes of effects are considered, our analysis clearly indicates that the benefits of dam removal outweigh the costs. Since the primary purpose of the DEIS and the ESA listing of anadromous fish is to aid in their recovery, every reasonable effort should be taken to truly weigh the magnitude of benefits and costs of outcomes. In their selection of the preferred alternative, the federal managing agencies are willing to make a tradeoff in the survival of endangered species, without properly accounting for the price of doing so.

**Closing**

Thank you for your consideration of ECONorthwest’s comments. We sincerely thank the managing federal agencies, their employees, and their contractors for working to maximize the benefit to the American people. We look forward to reviewing the revised FEIS.

Sincerely,

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