From:	Glen Spain
To:	Wr401program
Subject:	PCFFA/IFR Supplemental Comments on Klamath Project Draft EIR for filing
Date:	Monday, February 25, 2019 6:51:03 PM
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CA State Water Resources Control Board 26 February 2019

ATTN: Ms. Michelle Siebal Via Email

Division of Water Rights – Water Quality Certification Program

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SUPPLEMENTAL PCFFA/IFR COMMENTS

RE: Klamath – Proposed removal of Lower Klamath Project

Action: Dec., 2018 Draft Environmental Impact Report (DEIR) for the

Lower Klamath Project License Surrender

State Clearinghouse Doc. No.: 2016122047

Dear Ms. Siebal:

Attached are our Supplemental Comments on the Draft EIR, for posting on the Record. Please contact me immediately if the attached PDF document cannot, or any reason, be read and reproduced. THANKS.

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26 February 2019
Via Email

SUPPLEMENTAL PCFFA/IFR COMMENTS
RE: Klamath – Proposed removal of Lower Klamath Project
Action: Dec., 2018 Draft Environmental Impact Report (DEIR) for the Lower Klamath Project License Surrender
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Dear Ms. Siebal:

In general, both PCFFA and IFR endorse and incorporate herein by reference the written comments to be submitted by Feb. 26, 2019, by the Klamath River Renewal Corporation (KRRC), which we have reviewed and approve. The KRRC editing comments help clarify some areas in the Draft Environmental Impacts Report (DEIR) that are unclear, or which may be duplicative.

Please consider these as our Supplemental written comments on behalf of the Pacific Coast Federation of Fishermen's Associations (PCFFA) and its sister organization, Institute for Fisheries Resources (IFR) regarding the Draft Environmental Impacts Report (DEIR) released Dec. 2018, regarding the proposed State of California 401 Certification for removal of the Lower Klamath Dams within the State of California (i.e., CopCo 1 & 2 and Iron Gate Dam). Please make them part of the permanent public record for this decision-making process. Although our two organizations generally support the separate KRRC comments, PCFFA and IFR are separate legal entities presenting these Supplemental written comments solely on their own behalves, and do not in any capacity speak for the KRRC.

PCFFA is the largest trade organization of commercial fishing families on the U.S. west coast, representing the economic interests of the west coast's mostly family-owned, commercial

fishing fleet members, many of whom make all or part of their livelihoods from the harvesting of salmon whose origin is the Klamath River. Also, the west coast's intermingling stock salmon fisheries all the way from Monterey, CA to the Oregon-Washington border are often closed or severely limited, based on "weak stock management" constraints often triggered by the depressed salmon runs of the Klamath River, which typically migrate and intermingle with other more abundant salmon stocks within those regions. As PCFFA's sister organization, IFR has also been working to restore habitat and stream flows for damaged Klamath salmon runs, which were once the third largest salmon runs in the continental United States, since the mid-1980's. Additionally, many of both PCFFA's and IFR's members are PacifiCorp ratepayers and customers. Hence our two organizations and their members have multiple economic and community interests in the outcomes of this process.

PCFFA and IFR both strongly support the KRRC's ongoing efforts to remove the four Lower Klamath Hydropower Project FERC-licensed dams, including the three of the four dams (CopCo 1 & 2 and Iron Gate Dams) located in California, and which are the subject of the current dam removal project. Removal of these four Klamath Basin dams was agreed to in the Klamath Hydropower Settlement Agreement ("KHSA"), also signed by the dams' owner (PacifiCorp). Indeed, PCFFA and IFR are both signatory Parties to the original and amended KHSA documents as well. Both our organizations support the Proposed Project as the best choice among all the alternatives.

Responses to Persistent Myths Frequently Raised by Objectors to Klamath Dam Removals

On an initial note, looking at the prior Scoping Comments and other written comments from those (particularly Siskiyou County and the Siskiyou County Water Users Association (SCWUA)) who have vehemently opposed dam removals in the Klamath, many of their past written comments raised concerns related to water quality and other issues that have already been systematically analyzed and long-since debunked or rebutted by hard science. Nevertheless, to make sure the Record in this action is clear, in our initial comments below we will again puncture the many myths about likely sediment releases from dam removal and other impacts of dam removals that opponents of the Proposed Project are repeating in the media and in their written comments on this DEIR.

In particular, we once again we are still reading or hearing public comments in this process with alarmist language about the "massive amounts of mud" behind the dams, and of "toxic mud" supposedly sitting as "sediment time bombs" behind the dams. But in fact, as the prior NEPA/CEQA (2013) rigorous and multiply peer-reviewed analysis of potential Klamath dam removal impacts indicated, multiple studies of the sediment trapped behind the dams have concluded that not only would most of these sediments released be naturally washed through the system to the sea within about 24 months, but that there are NO significant toxics in those sediments above and beyond natural background levels to be concerned about.

Also, a number of sediment containment and stabilization mitigation measures are contained in the recently released June 2018 KRRC "Definite Plan" that will assure that sediment and other short-term water quality impacts will be minimized or eliminated to the extent that is feasible,

given that some short-term impacts are inevitable in order to achieve the many long-term water quality gains that would come from restoring the Klamath River's natural and free-flowing conditions. Additional sediment mitigation measures may also be adopted as part of the proposed 401 Certification process.

The debunked sediment and other specious concerns that continue to be raised by other parties in this process who oppose dam removals can be summarized as follows:

MYTH: "Massive amounts of toxic chemicals are in the sediments behind the dams." – Multiple studies and on-site surveys analyzing the chemical make-up of reservoir sediments have concluded that these sediments pose no significant risk to human health.[1, 2, 3, 4]

Opponents to river restoration often cite the Camp, Dresser, and McKee Study, which first assumes a worst-case sediment scenario, and then speculates that the high cost of such toxic sediment removal would push dam removal into the billions of dollars. However, this report was prepared before, and thus fails to acknowledge the results of, the many later studies referenced in footnotes herein (and in the DEIR itself) which disprove that report's initial (and unwarranted) assumption that significant toxic contamination even exists.

This "fake fact" assertion that there are significant toxic chemical contaminant concerns in sediments behind the dams has also been officially debunked. For instance, the US EPA issued a letter dated 4 November, 2015, on just this issue, noting that multiple studies have shown that there were no significant concerns about any toxic sediment problems in any of the reservoirs raised by any of several comprehensive studies. See ATTACHMENT A for a copy of that EPA letter for the record. In general, detections of potential toxic chemicals in sediment core samples were within the range of natural background levels, and well below the range of significant concern for human health.

And while the Draft DEIR noted that levels of arsenic are naturally elevated in the region (due to its volcanic history), human exposure pathways for arsenic were very limited in this highly rural region:

> "Thus, overall the Proposed Project would be unlikely to result in short-term or long-term substantive adverse impacts on human health under possible 'Exposure Pathway 2' [long-term exposure to reservoir terrace and/or river bed deposits] due to arsenic." [DEIR 3-143]

As to other contaminants, the DEIR correctly concluded:

[1] Klamath River Dam and Sediment Investigation, California Coastal Conservancy, November 2006.
[2] Preliminary Review of 2006 Analytical Testing Data from Sediment Sampling Conducted at Iron Gate, Copco 1, and JC Boyle Reservoirs, in Klamath River, Oregon and California, California Coastal Conservancy, September 22, 2006.
[3] Klamath River Reservoirs - Preliminary Sediment Sampling Data and Background Info, United States Depart of Interior, October 2010.
[4] Technical memo: Dioxin in Sediments Behind the Dams on the Klamath River, NOAA Water Quality Program Coordinator Joe Dillon, April 8, 2008.

> "After consideration of dilution, chromium, lead, and total PCB concentrations would be less than the most stringent human health drinking water standards in the Hydroelectric Reach from J.C. Boyle Dam to the upstream end of Copco No. 1 Reservoir...." [DEIR 3-144-145]
>
> "Thus, there would be little to no potential long-term potential for adverse impacts to human health from exposure to river water due [to] the release of reservoir sediments and associated inorganic or organic contaminants trapped behind the Lower Klamath Project dams, and there would be no significant impact in the long term for human exposure to inorganic and organic contaminants in the Hydroelectric Reach." [DEIR 3-149-150]

The Draft DEIR analysis also correctly noted that:

> "Implementation of mitigation measures WQ-2 and WQ-3 would reduce the short-term significant impact of human exposure to inorganic and organic contaminants in the Middle and Lower Klamath River and the Klamath River Estuary to less than significant." [DEIR 3-150]

We believe that the KRRC has already committed to these mitigation measures.

And as to the impact of released sediments on aquatic, non-human species, the DEIR analysis is that these impacts would also be less than significant.

> "Overall, one or more chemicals are currently present in the Lower Klamath Project reservoir sediments at levels with potential to cause minor or limited adverse impacts on freshwater aquatic species in the short term, based results from the Shannon & Wilson, Inc. (2006) study and the 2009–2010 Klamath Dam Removal Secretarial Determination study (CDM 2011), but chemicals present in the Lower Klamath Project reservoir sediments are expected to be mixed and diluted below water quality standards, reducing the likelihood of any substantial adverse impacts on freshwater aquatic species in the short term. In the long term, one or more chemicals are present, but at levels unlikely to cause substantial adverse impacts based on available evidence. Therefore, under the Proposed Project, the short-term and long-term impacts on freshwater aquatic species from exposure to sediment-associated inorganic and organic contaminants during sediment release and transit, and from potential downstream river-channel deposition, in the Middle and Lower Klamath River, would be a less-than-significant impact. [DEIR 3-158]

MYTH: "20-30 million cubic yards of sediment behind the dams would wash out and devastate the lower river." – These numbers and their impacts are both greatly exaggerated by Siskiyou County and SCWUA. Only about an estimated 13.1 million cubic yards of sediments in total were actually trapped behind the dams by 2012, an amount that is expected to rise to about 15 million cubic yards by 2020. But of these sediments, only about one-third to two-thirds of the total volume (5 to 10 million cubic yards in 2020) would be expected to wash out to sea

over 1 to 2 years, as the river becomes re-channelized, with the rest of these sediments to be replanted and stabilized as new river bank.

The majority of those sediments that would naturally erode and are likely to wash out to sea, however, are fine-grained and so would be easily mobilized by normal river flows and thus are not likely to be deposited in the river channel nor estuary for very long, if at all. In short, most of the mobilized sediment, as noted in the prior NEPA/CEQA (2013) analysis, would naturally wash out to sea within a couple of rainy seasons. The DEIR confirms this modeling prediction.

The less mobilized, larger gravel is also beneficial as it will likely help create gravel and cobble beds below the dams that are highly suitable for salmon spawning and rearing – indeed, the existing dams have systematically starved the lower river of natural recruitment of spawning and rearing gravel as much as 50 stream-miles downriver from Iron Gate Dam. (NEPA/CEQA (2013))

Alarmists warning of massive sediment erosion forget that rivers like the Klamath already, naturally, carry vast amounts of sediment out to sea as part of their natural baseline functioning, through natural erosion.

For instance, the Klamath River already normally carries an average water-year sediment load of about 5.834 million tons/year (which translates to 3.889 million cubic yards of sediment/year at a standard conversion rate of 1.5 tons/cubic yard density), which may be greater or lower depending on total rainfall. Sediment transport models (as noted in the DEIR) in fact indicate that, left completely to natural processes, high concentrations of suspended sediments would occur immediately downstream of Iron Gate Dam for only two-to-three months immediately following reservoir drawdown and removal.

But in fact, multiple reservoir silt stabilization and reseeding/revegetation measures are proposed by KRRC to help keep the downstream sediment flows, and later erosion flows, to a minimum. Data cited in the *Definite Plan* (June, 2018) estimate that with these mitigation measures in place:

> "The Project could release up to 1.2 - 2.9 million metric tons of fine sediment (sand, silt, and finer) downstream from Iron Gate Dam (RM 193.1) over a two-year period (USBR 2011)."[5]

In other words (except for a short-lived initial burst, which would be timed so as to avoid most impacts on migrating fish) additional sediment loads triggered by dam removals *would remain within the range of what already naturally occurs* in high-flow or wet water years.[6]

The Draft Environmental Impact Report (DEIR) confirms that sediment loads would be manageable as well as short-term impacts. Specifically the DEIR notes:

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[5] Definite Plan (July 1, 2018), Appendix I (Aquatic Resource Measures), Sec. 2.3.1, citing U.S. Bureau of Reclamation [USBR]. 2011. Appendix E – an analysis of potential suspended sediment effects on anadromous fish in the Klamath Basin. Prepared for Mid-Pacific Region, Bureau of Reclamation, Technical Service Center, Denver, Colorado. 70 pp.

[6] DOI Final EIS (April 2013), Klamath Facilities Removal Final Environmental Impact Statement/Environmental Impact Report. (See particularly section 3.11.3.3 and Table 3.11-3).

- "There would be an estimated 15.1 million cubic yards (14.6 million tons) of sediment stored in the J.C. Boyle, Copco No. 1, and Iron Gate reservoirs by 2020 (USBR 2012)." (DEIR ES-5)

- "Anticipated erosion volume due to dam removal into the context of annual basin-wide sediment discharge are estimated to average an annual total sediment supply from the Klamath River to the Pacific Ocean of approximately 5.8 million tons (4 million tons/yr. of fine sediment and 1.8 million tons/yr. of sand and larger sediment (Stillwater Sciences (2010). Farnsworth and Warrick (2007) estimate that the average annual silt and clay discharge is 1.2 million tons/yr.… In dry years the supply of sediment to the ocean could be less than 1 million tons/yr. (Figure 3.11-12). Given these estimates, it is expected that the amount of sediment released during the year of drawdown and dam removal would be similar to that transported by the Klamath River to the Pacific Ocean in a year with average flow, much less than that transported by the Klamath River in a wet year, and greater than that transported by the Klamath River in a dry year. See Section 3.11.5 *[Soil, Geology, and Mineral Resources] Potential Impacts and Mitigation* and Figure 3.11-12 for further details." (p. 3-769)" [DEIR 3-103]

- "A recent USGS overview report on the sources, dispersal, and fate of fine sediment delivered to California's coastal waters (Farnsworth and Warrick 2007) found the following:

    - Rivers dominate the supply of fine sediment to the California coastal waters, with an average annual flux of 34 million metric tons.

    - All California coastal rivers discharge episodically, with large proportions of their annual sediment loads delivered over the course of only a few winter days.

    - Farnsworth and Warrick (2007) conclude that fine sediment is a natural and dynamic element of the California coastal system because of large, natural sediment sources and dynamic transport processes." [DEIR 3-104]

- "The short-term (less than two years following dam removal) and long-term (2–50 years following dam removal) effects of the Proposed Project on sediment delivery to the Pacific Ocean would be less-than-significant, given the relatively small amount of total sediment input from reservoir sediment release in comparison to the total annual naturally occurring sediment inputs to the nearshore environment. Bedload sediment effects related to coarse sediment released by the Proposed Project or sediment re-supply likely would not extend downstream of the Cottonwood Creek confluence (RM 185.1). Therefore, there would be no bedload-related effects in the Klamath River Estuary or Pacific Ocean nearshore environment under the Proposed Project." [DEIR 3-755]

MYTH: "Massive sediment plumes from dam removal will kill all the fish in the lower river for many years to come." -- There will clearly be some adverse sediment impacts on fish within the mainstem of the river for a short period of time, but as noted above, these sediments

are expected to reach lethal levels for fish only for a short period of time during one single, first-year winter flushing event. The Executive Summary of the DOI Final NEPA/CEQA (2013) EIS/EIR notes:

> "While sediment release and other construction related activities during dam removal could cause short-term (1 to 2 years) adverse impacts on fisheries downstream from the Hydroelectric Reach, salmon and other aquatic resources would be expected to return to population levels observed prior to dam removal (in 2010 when the Notice of Preparation was issued) within 5 years……[7]

And of course, these estimates are for the Klamath River and all its dams as a whole, including a contribution by J.C. Boyle. But since the sediments trapped behind J. C. Boyle Dam are relatively minor, that contribution would not be substantial.

The plan for reservoir drawdown to be completed in the high-flow winter season within a single year (2021) is also designed to minimize negative effects of sediment surges on sensitive fish species, particularly federally listed coho salmon. Drawdown will be timed to avoid the major runs of fish, many of which (such as coho) only use the mainstem river briefly each year as a migration corridor, and would thus be safe within their usual tributary habitat during the lethal peak of the mainstem sediment surge.

MYTH: "Removing the Klamath dams would eliminate their flood control benefits." -- First off, the dams in question were never designed for flood control and thus provide little emergency water storage in the event of flood-level flows. At very best, the reservoirs could physically provide less than 7% attenuation of any 100-year flood event, and then only for a few hours' time, i.e., until their reservoirs were full.[8] At most, this might provide just a 10-hour delay in the peaking of any lower river flooding.

As to any additional flood risk caused by the actual drawdown of the dams themselves during deconstruction, the DEIR correctly has this to say:

> "While the release rates that would occur during reservoir drawdown would be greater than the flows at the same time under the existing conditions, and in some months above the historical monthly maximum flow (e.g., September), they would be lower than the overall peak flows for extremely wet years recorded during the period of record in each reach. Because the flows would stay below historical peak flows, they would not change the floodplain or flood risks in comparison to the existing conditions. Thus, the short-term increases in downstream flows and changes to flood risks resulting from reservoir drawdown would be less than significant." [DEIR 3-630, 631]

Reservoir drawdown plans were made with consideration for minimizing flood risks downstream. Controlled releases during reservoir drawdown would not be likely to increase flood risks because they would be kept well within the range of historic flows.[9]

[7] DOI Final EIS (April 2013), Executive Summary, pg. 39.
[8] DOI Final EIS (April 2013), see pg. 3.6-32, especially Table 3.6-9. The greatest recent flood in the region occurred in 1964 – two years *after* the final dam at Iron Gate was constructed.
[9] DOI Final EIS (April 2013), see Section 3.6.4.3.2.

From the California-Oregon border, since these dams were not designed to provide any flood control, the total removal of the dams would pose no additional flood risks:

> "Because J.C. Boyle Reservoir provides no storage and the dam typically operates in spill mode at flows above plant capacity (i.e., approximately 6,000 cfs; Table 2-1 in USBR 2012), existing conditions peak flows in the Hydroelectric Reach are not attenuated as a result of J.C. Boyle Dam..... Therefore, under the Proposed Project the 100-yr flood inundation extent on the Klamath River from the Oregon-California state line downstream to Copco No. 1 Reservoir would not change from existing conditions (see also Appendix K). [DEIR 3-634, 635]

Below Iron Gate Dam, however, the situation changes, albeit only slightly:

> "Hydrologic and hydraulic modeling of floodplain inundation shows that removal of the Lower Klamath Project dams could alter the 100-year floodplain inundation area downstream of Iron Gate Dam between RM 193 and 174 (i.e., from Iron Gate Dam to Humbug Creek) (USBR 2012). The modeling indicates that the differences between existing conditions and the Proposed Project are minor..... This increased discharge would result in flood elevations that are 1.65 feet higher on average from Iron Gate Dam (RM 193) to Bogus Creek (RM 192.6) and 1.51 feet higher on average from Bogus Creek to Willow Creek (RM 188) (Appendix B: *Definite Plan*). The impact of dam removal on flood peak elevations would decrease with distance downstream of Iron Gate Dam, and USBR (2012) and the KRRC (Appendix B: *Definite Plan*) estimated that there would be no significant effect on flood elevations downstream of Humbug Creek (RM 174)....." [DEIR 3-630]

These impacts are significant, albeit they would impact only a small number of structures and then only to a minor degree, but there are a number of mitigation measures the KRRC is already assuming as part of its mitigation obligations under the KHSA, as noted below:

> "The KRRC proposes to work with willing landowners to implement a plan to address the significant flood risk for the 36 habitable structures (including permanent and temporary residences) located in the altered 100-year floodplain between Iron Gate Dam and Humbug Creek following dam removal. The KRRC would work with the owners to move or elevate the habitable structures in place before dam removal, where feasible, to reduce the risks of exposing people and/or structures to damage, loss, injury, or death due to flooding. However, flood damage and/or loss of structures that are not feasible to move or elevate would be a significant impact. Final determination of the future 100-year floodplain after dam removal would be made by FEMA. The KRRC is coordinating with FEMA to initiate the map revision process (Appendix B: *Definite Plan*). The Project Component would also evaluate the river crossings that could be affected by a substantial risk of damage due to flooding. [DEIR 3-632]

The KRRC is actively working with Hornbrook area landowners to fully mitigate these risks wherever possible. Among the various previously proposed additional mitigation measures to minimize flood damage risk that should be adopted in the revised Definite Plan (if they have not

already been) are: Mitigation Measure H-1 (install new river flow gages and improve predictive flooding models, thus increasing warning time to residents of any impending flood): new National Weather Service (NWS) warning systems can also be installed to give residents more accurate flood predictions as much as two days in advance.

MYTH: "Keeping the dams would cost far less than tearing them down." -- Actually, the financial facts show just the opposite: It would actually cost PacifiCorp ratepayers far more to retrofit and relicense these aging and now economically obsolete dams than to replace their small amount of power from other, newer and much more cost-efficient resources.

The 1956 Federal Energy Regulatory Agency (FERC) 50-year license to operate the Klamath Hydropower Project expired in 2006. PacifiCorp, the company that owns the Klamath dams (J.C. Boyles Dam in Oregon, and CopCo Dams 1 & 2 and Iron Gate Dam in California, in river-descending order), can limp along on *temporary* one-year FERC license extensions only while an active application for FERC relicensing is pending. That time is coming to a close and a decision on the fate of these dams must soon be made. No privately-owned dam can legally operate without a valid FERC license.

Whatever choice PacifiCorp (also called "Pacific Power" in California) could make, the company's costs of that decision will ultimately be charged to its customer/ratepayers. *This is how electrical utilities work.* Their only source of revenues is generally the creation of electrical power they then sell to their customers, collecting enough revenues from their customers to fund their operations. This is all tightly regulated by state Public Utilities Commissions (PUCs) in each state where they operate, as the watchdog agencies that assure that their state's customers get charged fair, reasonable – *and generally the lowest-cost* – power rates for the services they receive.

There are only two legal options for these Klamath Hydropower Project dams, both of which will cost PacifiCorp ratepayers money: (1) either fix them up and relicense them to modern standards, which turns out will cost *at least* $460 million, and quite likely more than $500 million once all (currently unknown) water quality mitigation costs are added in, with no upper cost cap, according to PacifiCorp testimony to the PUCs,[10] or; (2) decommission and remove these aging dams entirely – which it can now do under the Klamath Hydropower Settlement Agreement (KHSA) for a "capped" cost to its customers of only $200 million, with the rest paid by the State of California.[11]

And according to estimates by FERC, even after all the expensive retrofitting to meet modern standards for relicensing, these dams would then only generate about 61 MW of power on

[10] See CPUC Docket No. A10-03-015, *Testimony of Cory Scott*, Exhibit PPL-300 (March 18, 2010), pg. 6; Opening Brief of PacifiCorp (Nov. 17, 2010), pg. 6. PacifiCorp's "conservatively estimates" relicensing costs of at least $400 million in capital improvements, plus $60 million in operations costs and maintenance over a 40-year relicensing term, not counting likely large (but still unknown) additional costs for any water quality mitigations that may be required to meet state 401 Certification requirements in Oregon and California.

[11] The rationale for this bi-state equitable cost-sharing scheme is that nearly 600,000 Oregonians are PacifiCorp customers already paying into a Klamath Dam Removal Trust Fund monthly, while only about 40,000 Californians are ratepayers – but most economic benefits for restored Klamath salmon fisheries will be in California. This California cost share is now available under California's Proposition 1 Bond Act, already passed by California voters.

average -- *about 26% less than they do today*.[12] Relicensing thus means spending a great deal of money for what is actually very little power. In fact, FERC estimated in its 2007 Final Environmental Impact Report (FEIS) on relicensing that even if fully relicensed, the required retrofitting would be so expensive that these dams would then operate *at more than a $20 million/year net loss*.[13] In short, the Klamath dams are now economically obsolete. This above all reasons is why PacifiCorp is asking for permission to transfer them to the KRRC for removal.

The best current estimate for the total costs of decommissioning and full removal of the four dams, so that the Klamath River and its salmon can once again move freely through them, is about $397.7 million (in 2020 dollars), including various environmental mitigation measures.[14] By implementing dam removal through the KHSA, PacifiCorp thus saves its customers at least another $197.7 million (and perhaps much more) as well as reduces its own company and ratepayer risk and uncertainty. This is another reason the KHSA is a good deal for PacifiCorp customers.

On May 5th, 2011, the California Public Utilities Commission (CPUC) formally confirmed that the KHSA is indeed the most cost effective, least risk and therefore best alternative for PacifiCorp's customers as compared to relicensing.[15] A prior September 16, 2010, ruling by the Oregon PUC came to the same conclusion.[16] A small Klamath dam removal surcharge has been assessed PacifiCorp's Northern California and Oregon customers since those PUC decision to make up the company's $200 million contribution, which will all be in the PUC Trust Funds to use by the KRRC for dam removal by 2020 – at which point PacifiCorp's customers will not have to pay a dam removal surcharge any more.

In short, keeping the Klamath dams would mean extremely expensive fixes for a lot less power, and a Project that would likely lose money for the rest of any new license – *losses that customers would ultimately also have to make up for in even higher power rates*. The "bottom line" is that it's just a lot cheaper for customers to remove these dams than to keep them. And this is *completely ignoring* likely economic and jobs benefits of a restored world-class salmon run, a more stable irrigation system and the many other benefits also highlighted in the DEIR.

MYTH: "The region needs the power that the Klamath Dams provide. Without that power there will be brown-outs and other shortages of electrical supplies." -- This is nonsense. When the first Klamath hydropower dams were built starting in 1918, and for a short while afterwards, they were the only source of electrical power for Klamath Falls.

But in today's much more modernized and interconnected world, the electrical power used in southern Oregon and northern California through PacifiCorp can come from anywhere within its massive, six-state power grid, and if purchased through the Bonneville Power Administration (BPA) as a power broker, from even further away.

[12] FERC FEIS, Sec. 4.4, pg. 4-4 of 533,879 MWh = 60.90 MW relicensed output, rounded to 61 MW.
[13] FERC FEIS (Nov. 2007), Table 4-3 on pg. 4-2.
[14] See *Definite Plan (June 2018)*, Table 8.5-1 at pg. 304, available at: www.klamathrenewal.org/definite-plan.
[15] California PUC Final Order at: http://docs.cpuc.ca.gov/published/proceedings/A1003015.htm.
[16] Oregon PUC Final Order at: http://apps.puc.state.or.us/orders/2010ords/10-364.pdf.

The reality is that all four Klamath dams combined do not generate very much power. Although the whole Klamath Hydroelectric Project is technically rated for maximum power generation of about 171 megawatts (MW), these dams cannot run at maximum capacity 24/7, especially during summers when turbine flows are lowest.

The entire Klamath Hydropower Project combined actually generated only about 82 MW of power on average over the past 50 years of its license, according to FERC records.[17] This amounts to less than 2% of PacifiCorp's overall power production capacity. By comparison, a single modern electrical power plant can continuously generate 1,000 MW or more, and a single off-the-shelf windpower turbine is rated for power production up to 6 MW.

MYTH: "Replacing the power the dams create will increase carbon emissions from the resultant use of carbon generating electric production facilities."

PacifiCorp has no reason and no intention to replace the renewable power from the dams with anything other than more renewables. There is no reason whatsoever that any replacement power would have to be from coal or other CO_2-generating sources. There are also strong public policies and economic incentives driving PacifiCorp to divest itself of coal-fired plants generally, which it is in the process of doing, and replacing that energy with carbon-free renewables.

As to replacement power, when Pacific Power was bought by Berkshire-Hathaway in 2005, the Company legally committed to bringing more than 1,400 MW of brand new, cost-effective non-carbon renewable power online by 2015.[18] This is already *17 times more* electrical power than the four Klamath dams generate all together. In fact, it has considerably exceeded that goal.

For a company of PacifiCorp's size and expertise, adding a mere additional 82 MW of cost-effective and clean replacement power to its grid after 2021, as it intends to do under the KHSA, would be an almost trivial task by comparison. It is fair to say that the company has already done so many times over.

There are many options for the replacement of this power from comparable carbon-free or renewable sources by 2020.[19] The DEIR correctly makes this very clear, as well as factors in the net reduction of the greenhouse gas methane (CH_4) from elimination of the reservoirs that emit this other greenhouse gas, which is 28 times more effective as a greenhouse gas than CO_2, although shorter-lived in the atmosphere:

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[17] The November, 2007 FERC Final EIS ("FERC FEIS") is available online at: http://elibrary.ferc.gov/idmws/File_list.asp?document_id=13555784 or found by a FERC docket search at www.ferc.gov, Docket No. P-2082-027 posted November 16, 2007, Document No. 20071116-4001. This number is taken from FERC FEIS, pg. 1-1, as 716,800 MWh, which divided by hours per year (24 hrs./day X 365.25 days/year) = 81.77 MW actual output, rounded to 82 MW – less than 2% of PacifiCorp's total power production.

[18] See for instance, *Final Order*, Measure 41, in CPUC Docket A05-07-010.

[19] A single modern wind turbine, for instance, can generate up to 6 MW of power and it would take fewer than 55 such wind turbines, even at a very conservative assumed 25% efficiency, to *completely replace* the total amount of "green power" these four dams now generate – and only 41 such wind turbines to replace the 61 MW after any hypothetical relicensing. A single modern "wind farm" may contain hundreds of such wind turbines.

> "In 2017, PacifiCorp issued an Integrated Resource Plan (IRP) identifying the preferred power generation portfolio over the next 20 years. The IRP indicates that PacifiCorp plans to meet new energy resource needs primarily through new renewable resources and demand management (e.g., energy efficiency measures) over the 20-year (2017–2036) planning horizon. The IRP includes the anticipated loss of Lower Klamath Project hydroelectric generation beginning in 2020. The preferred portfolio also identified a reduction in coal capacity of 3,650 MW through the end of 2036. PacifiCorp projects that between 2017 and 2036 its average annual CO_2 emissions would be reduced by 24.5 percent falling from 43.8 million tons in 2017 to 33.1 million tons in 2036 representing an annual average reduction in CO_2 emissions of 10.7 million tons (PacifiCorp 2017b).
>
> "Removal of the reservoirs associated with the Lower Klamath Project dam complexes would also result in a reduction in methane (CH_4) production. As previously described, CH_4 emissions from the reservoirs range from 4,000 to 14,000 MTCO2e per year.[20] Under the Proposed Project, these CH_4 emissions would cease to be a factor and would further reduce GHG emissions beyond the projections in the PacifiCorp 2017 IRP.
>
> "Since it is planned in the 2017 IRP for PacifiCorp to add new sources of renewable power or purchase RECs to comply with the California RPS, and removal of the reservoirs would result in a reduction in methane production, it is not anticipated that the replacement of the hydroelectric energy from the Lower Klamath Project dam complexes would result in an increase in GHG emissions from non-renewable power sources. As such, GHG impacts from replacement of the hydroelectric energy from the Lower Klamath Project dam complexes is determined to be less than significant." [DEIR 3-728, 729]

MYTH: "Water will be taken away from farmers because taking down the dams will destroy irrigation systems." -- The reality is that removing the dams will have no effect whatsoever on the irrigation system of the federal Klamath Irrigation Project in Klamath and parts of Modoc and Siskiyou Counties. That extensive irrigation system is fed directly from Upper Klamath Lake by diversions at Link River Dam or (in small portion) by numerous small systems allowing direct pumping from the reservoir above Keno Dam, or from Gerber Reservoir, which has no hydrological connection to the Klamath River. That entire federal irrigation systems is hydrologically well above the four PacifiCorp Klamath hydropower dams, and so removal of those dams will not affect the federal Klamath Project water delivery system hydrologically above it in any way.

There are only a handful of riparian water users along the river below the dams, some of whose existing pumps might be affected by sediments coming down from dam removal on a very short-term basis, but this is only a very few people and those impacts can be readily mitigated through appropriate filtering systems, if they occur at all.

As to the impacts of removing the dams on lower river irrigation flows, the DEIR correctly points out that these impacts would be minimal to zero, as explained as follows:

[20] MTCO2e = "metric tons of carbon dioxide equivalent," a measurement unit by which to compare greenhouse gas impacts relative to each other in the atmosphere.

> "Using historical flow data to create a set of flows under future operational prescriptions, USBR (2012) compared modeled surface water flow rates at Iron Gate Dam under the Proposed Project to a dams-in scenario. Modeling results indicate that under the Proposed Project, average monthly flows in the Klamath River just downstream of Iron Gate Dam would only slightly increase or decrease (typically less than approximately 15 percent) depending on month and water year type, compared to existing conditions. The anticipated small relative changes in Klamath Rivers flows are due to the fact that the Lower Klamath Project reservoirs were not designed, nor are they operated, as seasonal storage reservoirs for maintaining downstream flows for irrigation or drinking water diversions. As a whole, the Lower Klamath Project is primarily operated as a run-of-the-river operation, with inflows essentially matching outflows below Iron Gate Dam. Thus, the Lower Klamath Project has only a small effect on daily, monthly, seasonal, or annual flow conditions downstream of Iron Gate Dam. USBR (2012) modeling results indicate that at Seiad Valley, approximately 62 river miles downstream of Iron Gate Dam, surface water flow rates under the Proposed Project would be nearly identical to those under existing conditions." [DEIR 3-677]

MYTH: "There has been no analysis of the economic damages to Siskiyou County, Modoc County, or other adjacent and directly impacted counties." -- This is another obvious factual error. Not only does this DEIR analyze in depth the public service, population and housing, social services and other socioeconomic impacts of the Proposed Project on these counties and their regions, but there are numerous studies of these impacts that were part of the original NEPA/CEQA (2013) analysis done to inform the Secretarial Decision.

Potential impacts on the property values of landowners around Copco Lake and Iron Gate Reservior, potential county property tax revenue changes and other similar economic impacts have all been thoroughly studied and those impacts are well-known. This includes studies of real estate values around the lakes, as well as potential property tax impacts and estimates.

Dozens of these studies are available on the official Klamath Dams web site at: www.klamathrestoration.gov, and specifically from the following link: https://klamathrestoration.gov/keep-me-informed/secretarial-determination/role-of-science/secretarial-determination-studies.

Many of these socioeconomic impacts, however, as noted in DEIR Sec. 5-4, are simply outside the jurisdiction of the State Water Board in that they have nothing to do with water quality impacts *per se*, as well as are outside what are considered "impacts to the environment" to be considered under CEQA. Those that were deemed within the scope of CEQA were considered in detail in DEIR Sec. 5-4 and elsewhere throughout the document.

MYTH: "The data from the former EIS/EIR process for the Secretarial Determination is either too old, or too unreliable, to use in the current DEIR analysis." -- Dozens of detailed studies were done in preparation for the NEPA/CEQA (2013) analysis and the then-planned Secretarial Determination. Those studies are all still highly relevant to this 2018 DEIR, and were also subjected to reconsideration by the authors of the 2018 DEIR as to whether any significant changes had occurred, including new information if any. Most of those studies are still quite accurate, and still represent the best available science.

Then too, the original studies for the NEPA/CEQ (2013) process were not only peer-reviewed once, but peer-reviewed a second time by Independent Panels of experts, and then the Secretarial Determination those studies were summarized into was itself later independently peer-reviewed once again. The end result was a robust three distinct levels of independent peer-review to check, double-check and cross-check the conclusions of those studies.

SCWUA frequently cites the concerns about information bias in the Secretarial Determination process raised in allegations in February, 2012, by Dr. Paul Hauser, which became a *cause célèbre* among dam removal opponents, but SCWUA deliberately neglects to note that those same claims were thoroughly investigated by the Inspector General of the Department of Interior, which commissioned a highly credible, independent scientific review committee that reviewed Dr. Hauser's allegations and unanimously found in its findings report of August, 2012, that there was no substantial merit to Dr. Hauser's accusations of scientific bias in the Secretarial Determination NEPA/CEQA (2013) review or press release process.[21]

Comments on Proposed "No Hatchery Alternative" Impacts on Commercial Fishing

The DEIS Executive Summary at E-7 discusses the current plan for dealing with Iron Gate Hatchery production under the Proposed Project as follows:

> **"Fish Hatcheries --** During demolition, some Iron Gate Hatchery facilities located at the base of Iron Gate Dam would be removed, along with the cold-water supply and aerator for the hatchery. However, operational components of Iron Gate Hatchery would be retained and modified to continue operations at a reduced rate for just Chinook salmon and to eliminate coho salmon production. The nearby Fall Creek Hatchery, located at Fall Creek just upstream of Iron Gate Reservoir, would be reopened to maintain the current Iron Gate coho salmon production and some Chinook salmon production. The Iron Gate and Fall Creek hatcheries would remain in operation for eight years following removal of the dams, at which point the hatcheries would cease operations."

It is also the case that Iron Gate/Fall Creek hatchery production need not necessarily cease at the end of 8 years after dam removal has been fully accomplished, only that the promised PacifiCorp funding for that production would cease. At the end of that 8-year PacifiCorp funding term, the reconstructed Iron Gate and Fall Creek Hatcheries should be left in a condition to continue production if that is decided upon by CDFW, based on conditions in the river and the rates of recolonization and associated natural production recovery progress.

We do NOT SUPPORT the "No Hatchery Alternative" in any form. The DEIS notes that under the "No Hatchery Alternative":

> "While natural-origin returns typically outnumber hatchery returns, the proportion of the Chinook salmon escapement comprised of Iron Gate Hatchery returns has historically

[21] *Independent evaluation of the scientific record pertaining to the allegations of Dr. Paul Houser*, prepared by RESOLVE, Washington, DC (August, 2012).

> been substantial (~35 percent of age 3 adults; KRTT 2011, 2012, 2015). Eliminating the hatchery goal of releasing around 6 million Chinook salmon smolts and yearlings annually would likely result in a reduction in adult hatchery returns to the Klamath River.....
>
> "Based on historical data (CDFW 2016b), the reduction in returns could average around 16,000 fish beginning in post-dam removal year 3, as the population responds to the benefits of dam removal. Based on the current proportion of hatchery adults in the run, this could represent a short-term reduction in abundance of around 35 percent of age 3 adults on average until production from newly accessible habitat increases adult escapement (anticipated to begin in dam removal year 3, Table 4.6-1). However, depending on the year, the reduction could be as high as 50 percent (the proportion of hatchery return adult spawners in 1993 for example), or as low as 19 percent (the proportion in 1995) (KRTT 2015). [DEIR 4-306, 307]

This alternative would amount to a huge spawner deficit for several years running until natural production could infill into restored habitat, which could take several fish generational cycles to accomplish, especially in the absence of human intervention such as egg out-planting efforts.

There is already a serious, long-term fall-run Chinook spawner deficit affecting the river (see ATTACHMENT B – Klamath Fall-Chinook Escapements (1998-2012)) and an unacceptably high risk of future fall-run Chinook stock extinctions as a result, particularly of the weakest sub-stocks.

It should be noted that historically (i.e., before European colonization and development) the Klamath River is estimated to have produced an average annual 500,000 fall-run Chinook. Today (as seen from ATTACHMENT B) fisheries managers are hard pressed to assure that the Pacific Fishery Management Council's (PFMC) fall-run Chinook escapement "minimum spawner floor" of 40,700 natural spawners can be met. Suddenly subtracting all hatchery production from the system would simply increase the pressure on the already extremely weakened natural stocks, at least in the short term, from natural predation and other natural mortality factors as well as fishing pressures.

It is argued in the DEIR that:

> "The impact of a reduction in the number of hatchery returning fish is not equivalent to a reduction in the natural-origin population, from a population perspective..... As discussed in detail in Section 3.3.2.3 Habitat Attributed Expected to be Affected by the Proposed Project [Fish Hatcheries], hatchery returning adults can have substantial detrimental effects on native populations. As such, a reduction in hatchery returns under this alternative would be a benefit for fall-run Chinook salmon over the long term. [DEIR 4-307]

However, since our industry is highly dependent on the health of Klamath River fish production generally (both naturally and hatchery generated), and is also highly dependent on hatchery stocks generally, it is our strong preference that the Iron Gate/Fall Creek hatchery complex phase down its production only as natural spawner production increases in areas now

blocked by dams. In other words, some proportionality should be maintained between recolonization success with recovery of natural production and reduced hatchery production. This recolonization process may take more than 8 years to complete, and it should be acknowledged that the original 8-year estimate was at most merely an educated guess.

In short, river conditions and real-time salmon recolonization success rates should dictate the hatchery production phase-out time frame, not arbitrary deadlines. And since these factors are by their nature unknown in advance (only estimated), the Hatchery Management Plan (HMP) and CDFW should maintain some flexibility as to the termination dates and phase-out plans for the Iron Gate/Fall Creek hatchery program. Otherwise both our industry and the entire Klamath River salmon-based ecosystem could face abrupt fall-offs in Klamath spawner numbers that would require major adjustments in fisheries management by the Pacific Fisheries Management Council (PFMC) and could cause severe and unexpected disruptions in harvestable salmon availability, including potential coast-wide, at-sea salmon fishery closures that could devastate coastal fishing-dependent communities. The sudden and major loss of between 35% and 50% of all fall-run Chinook spawners from the river would also doubtless have cascading negative impacts on the river's natural salmon-based ecosystems as well.

One simple principle for decreasing the problem of negative hatchery-natural stock interactions, particularly with respect to the problems of hatchery fish interbreeding with and thus truncating or diluting the natural genetic diversity that fish evolved for survival, is noted in the DEIS as follows:

> "Although eight years of additional hatchery production under the Proposed Project is anticipated to achieve the production levels predicted by the EDRRA model sooner than without continued hatchery production, immediate closure of Iron Gate Hatchery and no production at Fall Creek Hatchery would eliminate most interbreeding of hatchery and natural-origin salmon by post-dam removal year 3, and would likely increase the rate at which Chinook salmon develop traits adapted to their new habitats upstream of Iron Gate Dam (Goodman et al. 2011). This could increase survival of natural-origin Chinook salmon at a faster rate than with continued hatchery operations under the Proposed Project. Goodman et al. (2011) note that this effect would depend, in part, on the degree to which local Chinook salmon stocks have been integrated into the hatchery brood stock and the degree to which the current mixed hatchery and natural-origin spawning population has maintained genetic potential for life history diversity to adapt to conditions upstream of Iron Gate Dam." [DEIR 4-307 – underline added for emphasis]

In short, the Hatchery Management Plan (HMP) for the Klamath mainstem post-dam hatchery system should continue the CDFW's mandate for utilizing only the native wild (natural) fish gene pool as the broodstock for its hatchery program, thus maximizing the gene pool and life history diversity of these salmonids (both natural and hatchery in origin) from all sources that evolved to face Klamath river conditions. Any incidental interbreeding would then simply spread the same genes more widely into the population, increasing – rather than decreasing – overall population resiliency and survival rates.

On no account should non-native stocks be used for hatchery broodstocks. Assuming this policy remains in place, there is no particular advantage to a "no hatchery alternative" so far as avoiding natural-hatchery interbreeding is concerned, and the Proposed Action is clearly better

insofar as it will hasten the achievement of full recolonization of those released habitat areas above the dams in line with the EDRRA model. Additional salmon habitat restoration efforts also linked to dam removal mitigation mandates would also be expected to increase river carrying capacity for salmonids generally, thus to reduce inter-fish competition as well as to encourage faster recolonization of currently blocked areas.

As to the potential for the reduction of fish diseases (particularly *C. shasta*) within the river system, the Proposed Alternative and the No Hatchery Alternative are likely to be equally effective, as both will be accompanied by dam removals which will then not only restore spawning gravel to gravel-deprived areas, but would restore natural annual "flushing flows" considered necessary to mobilize and scour out and thus greatly reduce in-river habitat for the *C. shasta* polychete worm that is its primary disease vector.

FURTHER EXPLICATION OF FISHERIES BENEFITS

We concur with the DEIR finding (Sec. 5.4.1.1) of both severe economic impacts on the coastal ocean salmon fisheries and the communities those fisheries support as a result of the Klamath dams' impacts on river salmon productivity, and the conclusion of the DEIR that the Proposed Project (i.e., 4-dam removal) will greatly benefit these salmon fishing-dependent communities, as for instance these summaries:

- "Coastal ocean fishing-dependent communities have suffered severe economic impacts due to decreases in fish numbers and related harvest limitations. USBR (2012) identified that the removal of four dams and facilities would result in notable positive regional economic benefits to commercial troll fishing of SONCC coho and Klamath River fall- and spring-run Chinook salmon." [DEIR 5-5,6]
- "… dam removal would advance the long-term restoration of natural fish populations in the Klamath Basin, including having a significant beneficial effect on commercial fisheries and an associated significant beneficial economic impact on the coastal commercial fishing industry." [DEIR 5-7]

As an indication about just how dire decades of Klamath-driven declines and closures have become for the economies of once-prosperous Klamath Management Zone (KMZ) fishing ports, refer to ATTACHMENT C -- Declines in KMZ Port Salmon Landings Between 1976-2017. As compared to historic landings for the average of the years 1976-1980 vs. the average of the years 2010-2017, the Port of Eureka has suffered a 96% long-term decline and the Port of Crescent City has suffered a staggering 98% long-term decline in salmon landings.

The primary driver of these declines has been the persistent trend of decreasing salmon productivity in the Klamath Basin (see ATTACHMENT B), which in turn has been strongly driven by the enormously negative impacts of the Klamath Dams on salmonid production generally.[22]

[22]As documented in the Draft DEIR, Klamath dam adverse impacts on salmonids have included, but not been limited to: (1) cutting off access to an estimated 420+ stream-miles of originally fully occupied salmonid spawning

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We believe that there is overwhelming evidence in the record that the Proposed Project four-dam removal and the restoration of salmonids in the Klamath River back into their historic habitat will result in far more benefits and improvements in overall water quality of the river, as well as restoring the beneficial uses of restored fisheries and wildlife, than any other option. Furthermore, the short-term (mostly 2-years) of disturbance in the system will be well worth the much greater and long-term benefits, particularly since the adverse effects of those short-term impacts can and will be considerably mitigated. We are in agreement with the DEIR support the issuance of the 401 Certification with the current reasonable conditions proposed, and as proposed to be amended by the KRRC comments and our comments herein.

This concludes our supplemental written comments at this time. Thanks for the opportunity for public input, and please make this letter part of the record.

Sincerely,
Glen H. Spain
Glen H. Spain
NW Regional Director
PCFFA and IFR

PCFFA-CommentsCA401(02-26-19)

ATTACHMENT A – US EPA letter on Klamath sediments 4 November 2015
ATTACHMENT B – Klamath Fall-Chinook Escapements (1998-2012)
ATTACHMENT C – Declines in KMZ Port Salmon Landings Between 1976-2017

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and rearing habitat in the Upper Basin; (2) starving the lower river of recruitment of spawning and rearing gravel as far as 50 miles downriver from the lowest dam at Iron Gate; (3) major adverse impacts on water quality, including temperatures, pH, ammonia and dissolved oxygen (DO) levels; (4) creating ideal conditions in nutrient-filled, warmed reservoirs behind the dams for toxic algae blooms; (5) curtailing the ability to provide normal winter "flushing flows" sufficient to reduce infection levels from *C. shasta* and other diseases. Other factors leading to currently restricted coastal ocean commercial salmon harvests within the KMZ include the 1990 restructuring of harvest seasons, in the face of these declines, away from ocean fisheries within the KMZ in order to assure Tribal harvest quotas can be met, and general "weak stock management" constraints on all intermingling fisheries in which Klamath stocks have to be specially protected. But it is clear that, once more fish are once again produced by the Klamath River, that a number of these scarcity-imposed management constraints can also be reduced, allowing greater total numbers of fish to be landed within the KMZ.

ATTACHMENT A – US EPA letter on Klamath sediments 4 November 2015

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

4 November 2015

Dennis Lynch
Associate Regional Director
Northwest Region
U.S. Geological Survey
11412 NW 8th Court
Vancouver, WA 98685

Subject: Overview of EPA's Evaluation of Sediment Quality Related to Possible Removal of Four Klamath River Dams

Dear Mr. Lynch –

This letter is in response to your request that the Environmental Protection Agency (EPA) summarize our involvement in the analysis of sediments in the Klamath River in Oregon and California, as those sediments relate to the potential removal of four hydropower dams currently operating on the Klamath River.

Although EPA Regions 9 and 10 have been actively involved in evaluating and addressing water quality problems in the Klamath Basin for many years, our level of participation increased substantially as your program performed its evaluation of the feasibility of dam removal as a part of the "Secretarial Determination" process laid out in the Klamath Hydropower Settlement Agreement and Klamath Basin Restoration Agreement (KHSA and KBRA).

With EPA Region 9 as lead, EPA staff provided substantial input to the design of the sampling plan for sediments behind the PacifiCorp's Klamath dams. We also participated directly in the evaluation of the resulting data. Ultimately, we determined that sufficient physical, chemical, and biological sediment quality information had been amassed to support a positive Secretarial Determination on removal of the dams[1]. More specifically, we concluded

1 While strongly supporting dam removal, our comment letter on the Draft EIS for Klamath Facilities Removal noted that some additional data collection may be needed for subsequent site-specific permit-level decisions by individual agencies.

overall that:

- the sediments behind the dams are relatively homogeneous, and levels of chemical contaminants in sediment largely fell below screening threshholds used to assess sediment disposition;
- the sediments likely to be released during dam removal are not likely to have significant contaminant-related effects on downstream fish, wildlife, or human receptors especially after mixing and dilution; and
- fish, wildlife, and human exposures to sediment contaminants would actually be reduced overall compared to the with-dams scenario (the No Action Alternative).

EPA's conclusions are consistent with the discussions presented in detail in the Sediment Evaluation Report[2], and in Section 4.4.9 (Chemicals in Reservoir Sediments) of the Secretarial Determination Findings of Technical Studies[3] (Secretarial Determination). Note especially the discussion and data included in the Sediment Evaluation Report in Chapter 3, Table 2 and Appendix A in the former, and the data included in Tables 4.4.9-1 and 4.4.9-2 in the latter, which summarize the findings of the investigation and which data formed the basis of EPA's comments.

The Klamath Dams sediment quality evaluation was based on a robust data set. Starting from the results of initial screening level investigations performed in 2006 by Gathard Engineering Consulting and Shannon & Wilson, Inc., under contract to the California Coastal Conservancy, EPA helped develop the more comprehensive sediment testing program that the Department of Interior performed under the Klamath Secretarial Determination process in 2009 – 2011. This program ultimately comprised 75 reservoir sediment samples and two Klamath River estuary sediment samples. This sediment sampling program considered multiple potential "chemical exposure pathways," and was designed to be representative of the sediments most likely to be released if the dams were removed, as well as to provide information about thinner "bench deposits" that may remain in place or be deposited along banks downstream.

The testing program was primarily structured in accordance with the state-federal sediment testing guidance manual for the Pacific Northwest, called the Sediment Evaluation Framework (SEF). This framework uses a stepwise process to sequentially identify, and focus increasing attention on, the contaminants and contaminant exposure pathways of most concern.

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2 CDM 2011e. Screening-Level Evaluation of Contaminants in Sediments from Three Reservoirs and the Estuary of the Klamath River, 2009-2011. Prepared for U.S. Department of the Interior Klamath Dam Removal Water Quality Sub Team Klamath River Secretarial Determination. CDM, Sacramento, CA, 155 p + Appendixes.

3 Department of Interior. 2012. Klamath Dam Removal Overview Report for the Secretary of the Interior, An Assessment of Science and Technical Information. US Department of Interior, US Department of Commerce, and National Marine Fisheries Service. Available online at https://klamathrestoration.gov/

As described in the Secretarial Determination, multiple evaluation steps were undertaken per the SEF:

- **Level 1:** Assessment of existing information, including the Stillwater data set, and development of the comprehensive follow-up sediment sampling plan.
- **Level 2A**: Chemistry assessment for ecological and human health, comparing past and recently collected sediment chemistry data to a broad range of marine and freshwater sediment screening guidelines used in various programs around the country, including both dredged material management programs and remediation programs.
- **Level 2B**: Biological assessment, comparing laboratory toxicity and bioaccumulation testing results to a range of appropriate ecological and human health screening levels.

The testing done for the Klamath Dams sediment actually went well beyond the standard testing called for in the SEF. For example, the Klamath Dams sediment testing included many more potential contaminants than are typically evaluated, including many for which chemical screening levels are not provided in the SEF. The Klamath Dams sediment testing also gathered extra information concerning existing reservoir fish tissue contamination, a potential sediment-related contaminant exposure pathway associated with the No Action scenario of leaving the Dams in place.

Based on all these investigations, and EPA's experience evaluating and managing both highly contaminated and relatively un-contaminated sediments nationwide, we reached the overall conclusions listed above and strongly supported removal of the Klamath Dams. We continue to support the concept of removing these dams, and look forward to participating, as appropriate, in any detailed permit-level reviews that may be necessary as this project progresses.

You have also asked how the proposed dam removal project would be analyzed under the federal Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. Section 9601, et seq. (Superfund). EPA has not conducted any formal Superfund evaluations of the proposed dam removal project, and nothing in this letter should be considered to be a waiver or release of liability under the Superfund program for any party. However, we are attaching for your information in Appendix A to this letter the most current MacDonald Consensus Probable Effects Concentrations (PEC) and Threshold Effect Concentrations (TEC) (MacDonald et al., 2000 or readily searchable at http://rais.ornl.gov/tools/eco_search.php). PEC values are intended to identify contaminant concentrations above which harmful effects are expected whereas TEC values identify concentrations below which harmful effects are not expected. Reservoir sediments with contaminant concentrations exceeding the PEC values would likely only present a risk to downstream receptors if the mobilized sediments were so highly contaminated as to cause water column concentrations violations of the state's water quality objectives or if downstream depositional areas were likely to become contaminated above the PEC values. Only then would the original reservoir sediments likely present an unacceptable risk upon mobilization and transport following dam removal.

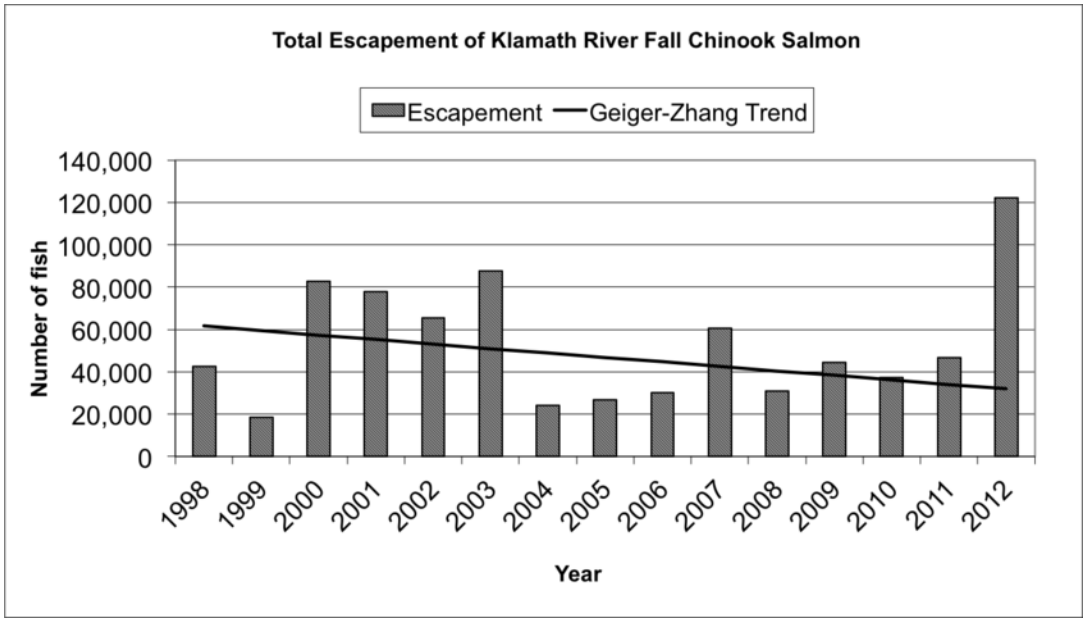
We appreciate that your project is ambitious in scope and potentially has significant benefits for protecting aquatic resources and water quality in the Klamath Basin. Please feel free to contact me directly at (415) 972-3409, or Brian Ross at (415) 972-3475 if you have any questions about EPA's review of the sediment quality information collected to date for the Klamath Dams.

Sincerely,

Janet Hashimoto

for Nancy Woo
Associate Director
Water Division, R9

ATTACHMENT B – Klamath Fall-Chinook Escapements (1998-2012)



ATTACHMENT C -- Declines in KMZ Port Salmon Landings Between 1976-2017

Pounds of Salmon Landed by the Commercial Troll Ocean Fishery For Major Klamath Management Zone (KMZ) Port Areas[23]

Year or Average of years	Eureka (CA)	Crescent City (CA)
Salmon Landings (nearest thousands of dressed pounds)[24]		
Av. of 1976-1980	1,403	393
Av. of 1981-1985	428	350
Av. of 1986-1990	405	155
Av. of 1991-1995	25	2
Av. of 1996-2000	35	2
Av. of 2001-2005	64	86
2006	0	0
2007	81	34
2008	0	0
2009	0	0
2010	4	0
2011	53	8
2012	78	5
2013	200	24
2014	110	27
2015	48	6
2016	6	*
2017[25]	3	0
Av. of 2010-2017 ==	62.8	8.8

* = Fewer than 500 pounds

SALMON FISHERY LOSSES BY PORT AREA
(Average of Years 1976-1980 as compared to Average of 2010-2017 landings)

Port Area		**Decline (%) of Fishery**
Eureka (CA)	=	**96% LOSS**
Crescent City (CA)	=	**98% LOSS**

[23] The port areas listed include landings in the following ports: Crescent City includes only Crescent City; Eureka also includes Trinidad and Humboldt Bay locations.
[24] Data from Pacific Fishery Management Council (PFMC), *Review of 2017 Ocean Salmon Fisheries (2/18),* Table IV-6. Available at: www.pcouncil.org.
[25] Preliminary 2017 numbers as of publication (2/18) may be slightly adjusted based on final figures.