Mr. Parker Thaler
State Water Resources Control Board
Division of Water Rights
Water Quality Certification Program
parker.thaler@waterboards.ca.gov
Via e-mail

January 29, 2016

RE: Scoping Comments on Application for Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act for the Relicensing of the Klamath Hydroelectric Project (FERC No. 2082)

Dear Mr. Thaler:

The California Water Impact Network (C-WIN), Save the Klamath-Trinity Salmon, the California Sportfishing Protection Alliance (CSPA), AquAlliance, the North Coast Environmental Center, and Safe Alternatives for our Forest Environment (SAFE) respectfully submit these comments on scoping for the Environmental Impact Report (EIR) for the issuance of a Water Quality Certification for the Relicensing of the Klamath Hydroelectric Project (FERC No. 2082).

We incorporate by reference the comments, and attached studies, of the Pacific Coast Federation of Fishermen's Associations (PCFFA), Institute for Fisheries Resources, Klamath Tribal Water Quality Consortium the Klamath Riverkeeper, the Hoopa Valley, Karuk and Yurok Tribes and the Quartz Valley Indian Reservation, and Dr. Josh Strange except where they conflict with the present comments. We recommend that the following documents be entered into the record for the proceeding: all reports related to the Klamath Basin Agreements Secretarial Determination; the Total Maximum Daily Loads for the Klamath and Lost Rivers in Oregon and California and associated studies in Oregon and California; studies on water quality and dam removal within the FERC docket P-2082; monitoring reports and studies related to the "Interim Reservoir

Management" that has been ongoing since the completion of the Klamath Hydropower Settlement Agreement in 2010; all documents from the record of Section 18 fish passage prescriptions and biological opinions issued by National Marine Fisheries Service (NMFS), and all reports on water quality cited and linked in these comments.

These comments are organized as follows. We start with a general statement of position, followed by recommendations for appropriate CEQA alternatives. We next describe issues that must be analyzed in the EIR, in particular issues that are not adequately addressed in PacifiCorp's Application for Certification (*Application for Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act for the Relicensing of the Klamath Hydroelectric Project (FERC No. 2082)*; hereinafter, Application). Thereafter, we discuss specific issues relating to water quality in the Klamath River watershed. Finally, we summarize our conclusions.

Summary of Position

The EIR should include an alternative that analyzes the removal of Iron Gate, Copco I, Copco II and J.C. Boyle dams and reservoirs. We believe that analysis will prove that these dams cannot be operated without violating state and federal law. The Board should also analyze whether the removal, or changes to the operation of, the Keno Dam and reservoir is also necessary to achieve Basin Plan compliance.

The EIR should analyze issues of pollution that originates in dams located in Oregon. It should analyze TMDL compliance, mandatory fish ladders, cumulative impacts, protective flows, Iron Gate hatchery pollution, economic impacts from dams, and ramping and bypass flows. These issues are not addressed in the Application.

The Board should reject PacifiCorp's proposed Reservoir Management Plan as a mitigation measure, as the proposed plan relies on hypothetical actions, on proven ineffective measures, and on more studies and planning in violation of CEQA requirements.

Ultimately, the EIR should support an action by the Board that either denies certification or that issues a certification that requires removal of at least Iron Gate, Copco I, Copco II and J.C. Boyle dams and reservoirs.

To the degree possible, the State Water Resources Control Board (State Board or Board) should coordinate its process with the Certification process of the Oregon Department of Environmental Quality.

The California sections of the Klamath River are listed as impaired for Microcystin, Organic Enrichment, Dissolved Oxygen, Temperature, Nutrients, and PH. PacifiCorp's Klamath River dams greatly add to these impairments and are considered a source of pollution, and have been assigned TMDL loads allocations for the majority of these impairments. These dams' discharges and reservoirs are violating water quality standards for the following objectives: Taste and Odor, Dissolved Oxygen, Temperature, Color, Floating Material, Biostimulatory Substances, and Toxicity. PaciCorp fails to acknowledge that majority of these violations and TMDL load allocations in its Application.

The beneficial uses of water contact recreations, cold freshwater habitat, commercial and sports fishing, Spawning, Reproduction, and/or Early development (SPWN), Native American Cultural Uses, Estuary Habitat, and non-contact water recreation are all impacted by project dams. However, in its Application PacifiCorp actually claims that the dams benefit the majority of these beneficial uses. This assertion is disproven in all other analyses and scientific findings related to the Klamath Dam relicensing process and Klamath River TMDLs.

The project reservoirs are a major cause of the decline of salmon species, create vectors for fish disease downstream of Iron Gate dam, and block passage to hundreds of miles of cold water habitat above the dams. During most years the dams exceed standards under the Basin Plan, Porter–Cologne Act, the Clean Water Act, and TMDL load allocations. They also create conditions of take of endangered species. Some of the impairments caused by PacifiCorp's impoundments are severe enough to impact all of the beneficial uses of the Klamath River in California and render the river unusable for at least several weeks a year.

The discharges from the dams are a point source of pollution, but the state is generally preempted under the Federal Power Act from enforcing water quality standards under state law. However, the federally mandated authority of the State Board under the Clean Water Act provides the Board with a once in a lifetime opportunity to correct the egregious water quality degradation of the Klamath Dams. In *Karuk Tribe v. California Regional Water Quality Control Board* (2010) 183 Cal. App 4th 330 at 360, the Court described both the limitation and the opportunity:

> A determination of federal preemption does not automatically mean that state input is categorically prohibited and state opinion of no consequence. The Clean Water Act gives states what appears to be a very substantial role by requiring that an applicant for any federal license comply with state water quality procedures. (See fns. 17, ante; S.D. Warren, supra, 547 U.S. 370, 386; PUD No. 1, supra, 511 U.S. 700, 707, 713.) But the crucial points are (1) that it is Congress that determines what is the extent of state input, and (2) that input takes place within the context of FERC licensing procedures as specified in the FPA. It is only when states attempt to act outside of this federal context and this federal statutory scheme under authority of independent state law that such collateral assertions of state power are nullified.

FERC licenses hydropower projects once every 30 to 50 years. Therefore, for procedural as well as substantive reasons, it is vitally important that the State Board get this right.

The number of feasible alternatives that the EIR can analyze is limited.

The Notice of Preparation states on p. 11: "Any feasible alternative must demonstrate the ability to meet California water quality standards."

Under CEQA, the Board is required to analyze a No Project Alternative. In the context of the requirement to meet water quality standards, the EIR should be clear in defining the meaning of No Project. The only feasible No Project alternative is denial of Certification.
The Board should analyze an alternative in which Certification is issued that allows the continued operation of the Fall Creek Development while requiring removal of Iron Gate, Copco I, Copco II and J.C. Boyle dams and reservoirs.

The Board should also analyze an alternative in which Certification is issued that allows the continued operation of the Fall Creek Development while requiring removal of Iron Gate, Copco I, Copco II, J.C. Boyle and also Keno dams and reservoirs.

The Klamath dams and reservoirs block gravel and sediment recruitment, absorb solar radiation and thus create stagnation in the reservoirs, create thermal lag, heat and deoxygenate reservoir water, create toxic algae, and discharge water that greatly amplifies the occurrence of fish disease. These conditions overwhelm the prospective benefit of the reservoirs acting as a "nutrient sink" for phosphorous, an alleged benefit that PacifiCorp argues in its application is determinative. (Application for Certification, Chapter 4) In the Klamath River TMDL, the North Coast Regional Water Quality Control Board (Regional Board) questions the benefits of any nutrient retention when natural conditions would flush out much of this pollution [Staff Report for the Klamath River TMDLs, the Klamath River Site Specific Dissolved Oxygen
Objective, and the Klamath and Lost River Implementation Plans pg. 4-26]. Removal of the dams would allow cold water tributaries to dilute nutrient rich water and would combat attached algae blooms and polychaete growth. Therefore, dam removal would solve many of the issues in the lower river that are attributed to nutrient pollution. Moreover, free flowing water is oxygenated and colder, and therefore does not allow for the growth of toxic algae which threaten nearly every beneficial use of the river downstream of the dams.

"Dam removal is expected to result in significant temperature, dissolved oxygen and cyanobacteria improvements; and nutrients and organic matter reduction." Therefore, "In the Klamath Hydroelectric Project (KHP) reach, dam removal would produce significant and rapid improvements – particularly during the "critical period" - for temperature, algal biomass, microcystin, and DO." (*Assessment of Long Term Water Quality Changes for the Klamath River Basin Resulting from KHSA, KBRA, and TMDL and NPS Reduction Programs*, August 2011 pg. 2http://klamathrestoration.gov/sites/klamathrestoration.gov/files/Final%20Klamath%20WQ%20Changes%20Analysis%20Approach_08_18_2011.pdf)

The FERC FEIS for the Klamath Project relicensing confirms that the Klamath Hydroelectric Project contributes to water quality impairment in the Klamath River and suggests that the only way to fully mitigate the Project's impacts on water quality is through dam removal. (*See* FERC FEIS, p. 3-166). According to the FEIS, dam removal will significantly improve water quality in the Klamath. Dam removal would result in reduced ammonia and pH fluctuations, and reduce the risk of algae and microscystin blooms. *Id*. Temperature, DO, and nutrient impacts would be reduced. *Id.* Disease impacts will also be mitigated.

FERC suggests that water quality objectives will not be met absent dam removal. The FEIS states: (1) "the project [without dam removal] would continue to adversely affect water quality conditions downstream of Iron Gate Dam, which has the potential to adversely affect [ESA-listed] juvenile coho salmon" (FEIS, p. 3-426); (2) "the project, as proposed, would continue to affect temperatures in the Klamath River;" (3) "even with implementation of best management practices that may be developed as part of a project-wide water quality management plan, it is likely that algal blooms would continue to occur in project reservoirs;" and (4) "some degree of project related nutrient enrichment would occur in the Klamath River downstream of Iron Gate Dam."

The Board may not have the power to deny a permit for the J.C. Boyle and Keno dams. However,

the Board has the responsibility to analyze a full dam removal alternative. PacifiCorp's dams impact over sixty miles of the Klamath River in two states. They are operated such that every dam's operation influences the next one downstream. The Klamath Hydroelectric Project is one project with one FERC license. If dam removal of the Oregon dams is not analyzed, the cumulative impacts of the project cannot fully be addressed, and the Oregon Certification will be unable to build on the California process. There are numerous analyses of dam removal on a federal level. Dam removal of J.C. Boyle or of both J.C. Boyle and Keno is reasonably foreseeable. The removal of one or both of these Oregon dams would provide the greatest substantial benefits to water quality in California. There are also many issues that would arise from removal of the three dams in California without removal of J.C. Boyle dam, because J.C. Boyle is a peaking facility that would present a danger to fisheries and humans if left in after the other dams were removed.

An MOU was used to coordinate the TMDL actions between Oregon and California because of the importance of Oregon's pollution to receiving waters in California. (http://www3.epa.gov/region9/water/watershed/pdf/Klamath-Implementation-MOA-090630.pdf) This coordinated method should be replicated in the EIR. In addition, this 401 Certification process should also be consistent with the Regional Board's TMDL analytical methodologies, so that this process can take advantage of the extensive prior Regional Board work already done, including its water quality models, and so that the standards used in this certification process will also be consistent with the TMDL.

PacifiCorp's Application for Certification is incomplete and inaccurate.

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The Application inadequately considers the cumulative effects of PacifiCorp's actions.

The Application does not address required fish passage or analyze how water quality impairments will impact fish once fish passage is provided for. Fish passage is not only reasonably foreseeable, it is required under the mandatory FPA Section 18 conditions of a new FERC license.

The Application does not address PacifiCorp's load allocations under the Klamath River TMDL. These impoundments are listed as major sources of water quality impairments and are assigned load allocations in the Klamath River TMDL. The Application also incorrectly states that Oregon needs to address water quality issues in Oregon despite state line TMDL load allocations, and ignores the extreme pollution in the Keno reservoir simply because PacifiCorp no longer wants this dam.

There is a wealth of studies and reports regarding the impacts of PacifiCorp's dams on dissolved oxygen nutrient production, temperature, fish diseases and toxic algae production and Ph. Instead of addressing these issues and their TMDL load allocations, PacifiCorp instead argues their reservoirs are a beneficial nutrient sink, that they aid fisheries, and that unspecified and unproven reservoir management plans can deal with reservoir related pollution

PacifiCorp proposes a Reservoir Management Plan that largely relies on unproven, ineffective actions, and studies, and on assessments of possible actions instead of actual mitigation.

PacifiCorp's Application does not include an analysis of dam removal, despite the fact PacifiCorp has publicly supported dam removal. Many of the NEPA documents related to the FERC relicensing, on which this application will in part rely, include analysis of dam removal.

We contend that the Application as written proposes a project that will not comply with the legal requirements of CEQA, the Clean Water Act, Porter Cologne, the Basin Plan, Klamath TMDL's, and the Endangered Species Act. The application omits, or dismisses without cause, current science literature and studies, related water quality assessments and processes and scientific controversy, as well as Section 18 fish passage prescriptions and biological opinions issued by National Marine Fisheries Service (NMFS).

The geographic extent of the cumulative effects analysis should extend from Link River Dam to the Pacific Ocean 200 miles from the mouth of the Klamath River, and should include affected fisheries in the Trinity River.

The "Project Area" for purposes of cumulative impacts analysis should be the entire area from the headwater of the Klamath River tributaries, downstream to the estuary, and should also include all other areas that suffer impacts from salmon population and fisheries losses and declines that can be causally linked to the Klamath Hydropower Project. These impacts occur within the Trinity River and also in the Pacific Ocean areas of the Klamath Management Zone ("KMZ") – an area extending from the shores of California and Oregon offshore out to 200 miles, north to at least Humbug Mountain, Oregon and south to at least Horse Mountain near Shelter Cove, California.

The DEIR should acknowledge that management measures for Klamath River fall Chinook salmon currently constrain fishing on other salmon stocks, from central Oregon to central California. (FERC FEIS pg. 3-4)

The EIR should not adopt PacifiCorp's Reservoir Management Plan, because it is insufficient as mitigation.

PacifiCorp recommends its Reservoir Management Plan for use as mitigation whenever it acknowledges in its Application that its project has an impact on water quality. However, the Application includes no discussion of the feasibility of this plan's actions, past results of related past actions, or associated costs of the actions in the plan. In many sections of its Application, PacifiCorp proposes to defer that specifics of some of the most important actions needed to meet water quality standards and improve beneficial uses until after a license is issued. Such deferral will not create enforceable conditions or assure protection of beneficial uses.

Under Interim Measure 11 of the KBRA, PacifiCorp has tested many of the mitigations proposed in its Reservoir Management Plan over the last eight years. Studies of these measures and the reports thus generated demonstrate that they have been largely ineffective. Many of the interim reservoir management studies and plans were vague and theoretical; with only incomplete or small scale studies to rely on, PacifiCorp now proposes still more studies as part of its Reservoir Management Plan, instead of actual concrete mitigations that include cost analysis and analysis of probability for success. This violates the intent of CEQA and of Section 401 of the Clean Water Act.

CEQA calls for a detailed analysis of both impacts and mitigation measures. As demonstrated in *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296 deferred mitigation is not legal

under CEQA. This was recently held up in *Madera Oversight Coalition, Inc. v. County of Madera* (2011) 199 Cal.App.4th 48 where the court found "the plain, unambiguous language" of the mitigation measure violated CEQA, and, "The post certification verification procedure [is contrary to law and] allows for an environmental decision to be made outside an arena where public officials are accountable."

The Board should use the CEQA process to protect beneficial uses by analyzing the potential effectiveness of concrete and effective reservoir management mitigations that would incorporate TMDL and applicable Basin Plan limitations and water quality measures. The Board should evaluate the ability of such measures to protect salmon and other fisheries. If water quality cannot otherwise be legally protected, then the Board must order a dam removal alternative and include it as a condition of the Certification or else deny Certification altogether.

The EIR must analyze cumulative impacts

CEQA requires the identification of significant impacts and the development of alternatives to avoid, reduce, or mitigate the impacts. This includes an analysis of cumulative impacts.

The cumulative impacts analysis must contain:

(1) either (a) a list of past, present, and reasonably anticipated future projects, including those projects outside the agency's control, which produce related or cumulative impacts or (b) a summary of such projections contained in an adopted general plan or related planning document which evaluates regional or area wide conditions, (2) a summary of environmental effects expected to be produced by those projects, and (3) a reasonable analysis of the cumulative effects of the relevant projects and the options for mitigating or avoiding each of the significant cumulative (http://www.ucop.edu/ceqa-handbook/chapter_03/3.3.html)

PacifiCorp's Application does not address the cumulative impacts of the project's reservoirs and operations, let alone impacts with past, present and reasonably anticipated projects. There is a rare mention that TMDL actions will help alleviate algal blooms, but these are not specified or quantified, though they are counted on to improve water quality. PacifiCorp leaves its most polluted reservoir, Keno Reservoir, out of the analysis. The EIR need to address these issues.

The Klamath River could be described as an upside-down type river system, one of the few rivers where water quality improves as water goes down river. In its application, PacifiCorp repeatedly blames upriver water quality conditions for its reservoirs' pollution, without admitting that these reservoirs control much of the management of the watershed or that they impound many springs and creeks that would otherwise allow for this water quality recovery through cold water inputs and dilution. The reservoirs impound many of the point source and non-point pollution that absent the reservoirs would be diluted and assimilated. Without the dams, dilution, water quality recovery, and algae composition changes would begin to occur sixty miles upstream from where they now occur, in contrast with the current situation in which polluted and cold water inputs are impounded and become stagnant.

The EIR must consider all significant impacts of its proposed project, regardless of whether those impacts occur offsite, and regardless of whether those activities would be attributable solely to the permitted activity or to that activity in combination with other circumstances including but not

necessarily limited to other past, present, and reasonably expect[ed] future activities in the relevant area. Under CEQA, an EIR must make at least a preliminary search for potential environmental effects, and if any such effect is perceived, must make at least a preliminary assessment of its significance. If the lead agency determines that there are one or more significant potential cumulative effects, then it must to carefully consider those effects in determining whether, and on what terms, to condition the proposed project. Even though this is not included in the application, it must be considered in the EIR. The administrative record must demonstrate the requisite consideration.

Instead of adhering to this standard in its Application, PacifiCorp fails to address actions that were analyzed as part of the FERC process, and in some cases actions specifically required in the process. These include the requirements for fish ladders and screening; the prior analyses of dam removal; Biological Opinions for fisheries; and the dams' impacts and the Klamath TMDLs for Microcystin, Organic Enrichment, Dissolved Oxygen, Temperature, Nutrients, and pH in Oregon and California. In addition to correcting these deficiencies, the EIR must also analyze related actions such as the historical and current removal and draining of wetlands; the management of wildlife refuges including pesticide use, draining and flooding; on and off Klamath Project Irrigation and tailwater returns; point and nonpoint source agriculture drains; water transfers; feedlot pollution; logging operations on private and public lands; industrial pollution; construction, use, maintenance and failure of roads in the watershed; water diversions throughout the basin; groundwater removal and pumping; chemical use; grazing; and water treatment plants.

Because the project involves "take" and take permits for endangered sucker fish and Coho salmon, this take should be analyzed in conjunction with other "take" throughout the basin. The EIR should analyze how all of these activities impact beneficial uses and Tribal Trust uses and resources.

The EIR should address foreseeable actions and influences such as population growth, climate change, logging, and other land use activities. In analyzing potential future impacts, agencies must do their best: "[d]rafting an EIR ... involves some degree of forecasting. While foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can." [See *Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners*] The agency's finding(s) as to whether impacts are reasonably foreseeable must be based on evidence in the record.

The EIR must analyze water pollution in Oregon.

A report from the North Coast Regional Water Quality Control Board states:

> "Achieving compliance with the Klamath River TMDLs in both California and Oregon requires a coordinated approach that involves state and federal agencies as well as responsible parties in both states. The Regional Water Board, Oregon Department of Environmental Quality (ODEQ), and USEPA Regions 9 and 10 have signed a Memorandum of Agreement (MOA) for implementing the Klamath River basin TMDLs." *(Action Plan for the Klamath River Total Maximum Daily Loads April,* 2010, hereinafter TMDL Action Plan. Available at: http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/100927/03_BasinPlanLanugage_Klamath_Lost.pdf)

Under the Clean Water Act, upstream states must ensure that their permitting or certification decision will not result in violations of water quality standards in affected downstream states. *See Arkansas v. Oklahoma*, 503 U.S. 91 (1992). This is true even if the standards imposed by the downstream state or, in this case, EPA-approved Indian tribe are more restrictive than those in the upstream state.

Both of the project dams in Oregon create slack, warm-water reservoirs that expose the Klamath River to sunlight for longer periods of time and with less shade over a broader area then natural river conditions, thus raising water temperature. This warmed water flows downstream before it is cooled by spring inflows. J.C. Boyle and Keno reservoirs both trap and hold natural sediments that would otherwise contribute to spawning and rearing gravel below them, thus impoverishing instream spawning and rearing habitat in what would otherwise have been prime spawning and rearing areas for resident rainbow and redband trout, and, after fish passage is restored, for salmon, suckers, lamprey and steelhead. J.C. Boyle and Keno trap sediments and concentrate nutrients that are the food sources for the growth of various algae species that thrive in warm-water reservoirs, including the highly toxic blue-green algae species. They also are responsible for killing Short Nose Sucker, an endangered species.

> Problems with high water temperatures at Keno and J.C. Boyle reservoirs result, as a consequence, in lowered dissolved oxygen (DO) levels. Additional sudden DO concentration dips can be caused by algae bloom die-offs. As these algae mats die off, their natural decay process also leads to elevated ammonia levels and various changes in pH from normal baseline conditions. These pervasive water quality problems all begin at Keno Dam and its warm-water reservoir, are continued downstream into J.C. Boyles Dam and reservoir, where they get more widespread and extreme, and then move downstream into California, where they then exacerbate all the water quality problems of the river below, making it harder to meet TMDL and other California water quality standards. (*Upper Klamath and Lost River Subbasins Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP) December 2010*. Available at: http://www.deq.state.or.us/wq/tmdls/docs/klamathbasin/uklost/KlamathLostTMDLWQMP.pdf)

CEQA requires that *all portions* of the same project be analyzed for their environmental impacts. In spite of the artificial divisions of a state line, the Klamath Hydroelectric Project is one single project, under one single FERC license, and all parts of the project are designed to interact in various ways. Analyzing California pollution and operations without a discussion of J.C. Boyle and Keno would lead to an incomplete analysis. This could possibly also impact Oregon's application or help to create a situation where only the California dams come down because no single analysis of dams' interactions on the receiving reservoirs' existed. See *Calif. Farm Bureau Federation v. California Wildlife Conservation Board (App. 3 Dist. 2006, 49 Cal.Rptr.3d 169, 143 Cal.App.4th 173 (*"Improper for an agency to divide a project into separate parts to avoid CEQA analysis"*), and San Joaquin Raptor Rescue Center vs. County of Merced (App. 5 Dist. 2007), 57 Cal.Rptr.3d 663, 149 Cal.App.4th 654, as modified* ("The entirety of a project must be described in an EIR, and not some smaller portion of it.").

Section 401 of the Clean Water Act is clear on this issue. It states that to the extent that a state

certifying agency proposes to certify a project under Section 401 that would cause or contribute to violations of a downstream state (or Tribe's) water quality standards, the Clean Water Act provides a mechanism to resolve such disputes. 33 U.S.C. § 1341(a)(2); 33 U.S.C. § 1377(e); 40 C.F.R. §§ 121.11-121.16; 40 C.F.R. § 131.7; *see also Wisconsin v. EPA*, 266 F.3d 741, 748-49 (7th Cir. 2001).

CEQA also stipulates that in a situation where a project includes many facilities working together, they have to be analyzed as one. There is no mention of a state line exemption in any of California Clean Water laws, or Porter Cologne.

A thorough discussion on pollution stemming from dams and reservoirs in the state of Oregon, and impacts to California from polluted receiving water, is included in the TMDL's for the Klamath and Lost Rivers in Oregon and California, cited above.

The EIR must analyze pollution in Keno Reservoir

One of the biggest pollution sources in Oregon that impacts California's receiving water is the Keno Reservoir. PacifiCorp seems to believe that it does not have to address pollution stemming from Keno reservoir because PacifiCorp has decided it does not want to relicense the dam. There is, however, no plan for decommissioning the Keno Reservoir. Keno flows currently control J.C. Boyle operations. The Keno facilities are wholly owned by PacifiCorp.

Keno Reservoir is known to have the worst dissolved oxygen levels in the Klamath River. It is also a heat sink that exacerbates many temperature issues. It has a profound impact on the Klamath River nutrient and algal levels. Keno Reservoir impounds and stagnates return flows from major tailwater drains and also the majority of the river's point source and non-point pollution. (*Upper Klamath and Lost River Subbasins Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WPMP) December 2010*). Keno also greatly changes the nutrient dynamics in the Klamath River. The cumulative impacts to water quality in this part of the river can not be overstated. Keno reservoir is a significant pollution source to the state of California and therefore should be part of this analysis. If Keno dam removal is found to not be prudent, then specific operational changes should be analyzed so it's discharges meet California water quality standards and state line TMDL's.

The EIR must analyze project impacts on fish species that are currently present and that would be present if the project were relicensed with mandatory fish passage prescriptions.

The reaches of the Klamath River between Keno Reservoir and Iron Gate Reservoir have some of the most adverse water quality conditions in the river, but they also have important cold water refugia that are impacted by dam operations. Past analysis and findings show the resident trout have been negatively impacted by water quality conditions, flows and ramping within these river reaches. In addition to taking into account this existing information, the EIR must address how these conditions may affect anadromous fish species, including sucker and lamprey species.

One of the biggest deficiencies in PacifiCorp's Application for Certification, beyond the omission of dam removal, is the Application's failure to acknowledge fish passage prescriptions whose implementation will be required if the project is relicensed, and to evaluate project effects on fish that would pass project facilities as a result of those prescriptions. The National Marine Fisheries

Service (NMFS) issued fish passage prescriptions pursuant to its authority under Section 18 of the Federal Power Act. If the project is relicensed, these prescriptions are not optional. They are mandatory.

Despite these prescriptions PacifiCorp does not address fish passage in its Application for Certification. For instance, PacifiCorp states:

> Notwithstanding the Section 18 fishway prescriptions by the Secretaries of Commerce and Interior, PacifiCorp generally agrees with FERC's FEIS analysis that recommends a trap-and-haul based adaptive management approach to reintroduction before making the substantial investment in volitional fishways at the various Project facilities that would be required by the Section 18 prescriptions. PacifiCorp nevertheless recognizes that the Section 18 prescriptions need to be addressed by FERC licensing of the Project. (Application, p. 5-27)

PacifiCorp challenged the basis of NMFS's Section 18 prescriptions in 2006 in "trial-type hearings" allowed by the Energy Policy Act of 2005. (An explanation of these hearings is available at: http://www.fws.gov/yreka/hydrofaqs.html). Presiding Administrative Law Judge Parlen McKenna made extensive findings-of-fact as a result of these hearings. (The findings are available at http://resighinirancheria.com/Documents/McKenna_Administrative_Law_Judge_Decision%20on%20Klamath%20River%20Dams%20-%20Docket%20Number%202006-NMFS-0001_09_27_2006.pdf).

We reproduce here some of the relevant findings here.

"Flow fluctuations from peaking operations increase energetic demands on salmonids, decreasing energy available for overall health, growth, and reproduction." (ALJ Finding of Fact 16-21)

"Project peaking operations kill, through stranding, large numbers of young fish and aquatic invertebrates that are the primary prey food for trout." (ALJ Finding of Fact 16-9)

"Flow fluctuations from peaking operations increase energetic demands on salmonids, decreasing energy available for overall health, growth, and reproduction." (ALJ Finding of Fact 16-21.)

In summary Judge McKenna found that increased flows, combined with limited peaking and more restrictive ramping requirements would increase available habitat (*Findings 16-1 through 16-6*), reduce impacts from stranding (*Findings 16-7 through 16-15*), reduce flushing of juvenile salmonids downstream (*Findings 16-16 through 16-20*), reduce energetic demands on fish (*Findings 16-21 through 16-23*), and increase macroinvertebrate production and food availability.

The Copco Two bypass reach has many issues with flows. Currently only 10 cfs is released at Copco 2 Dam. The Department of the Interior has stated: "of all river reaches impacted by the Project, the Copco 2 Bypassed Reach is the most strongly affected." (*Department of Interior 10(j) Recommendations,* p. D-24). Alt*ernative Fishway Prescription,* p. 3. This analysis should have a discussion of flows in this reach, and should recommend flows that would be protective of water quality and cold water fisheries beneficial uses.

Bypass operation below J.C. Boyle and Copco Dams deprives the diverted water from a turbulent

journey down the river that would help break down organic matter and phytoplankton. Nitrogen and phosphorus are more easily removed in downstream reaches when they are in inorganic form (ammonia and nitrate for nitrogen; orthophosphorus for phosphorus) than when they are bound up in organic matter. The longer it takes for the organic matter to become mineralized into inorganic nutrients, the further downstream those nutrients will travel before being removed from the water column. Thus, the bypass operations delay the natural improvements in water quality that occur as the Klamath River flows downstream from Keno Dam. Instead of disclosing and addressing these facts, PacifiCorp claims that the project improves water quality, which is actually a result of many cold water springs in this reach. The dilutive and cooling impact from these springs and cold water tributaries in the J.C. Boyle to Copco reaches would have a more significant positive effect with dam removal.

The EIR must analyze how climate change will affect water quality conditions, energy production and project operations and economics.

Recent studies published in the journal *Nature* discussed the fact that climate change is already taking a toll on energy production through lower flows and lesser cooling ability. (See http://www.nature.com/nclimate/journal/v2/n9/full/nclimate1546.html).Other recent studies demonstrate that dams impact climate change through the production of methane. Methane production is an issue in the Klamath reservoirs. Low flow and water warming in the Klamath River also appear to be a direct result of climate change. The EIR should analyze how the need to meet water quality standards will affect energy production in a warming environment. The EIR and the Certification must account for whether or how a relicensed project would meet water quality standards and the standards outlined in Basin Plan in a warmer world. The EIR must also account for the likely reduction in project energy production under climate change.

The EIR must account for, analyze and support the Thermal Refugia Protection Policy of the Klamath River TMDL.

The reaches of the Klamath River that are within the project area take in many springs and creeks that could provide vital refugia for migrating salmon and other anadromous fish species if the dams were not in place. These refugia could also provide needed cold water for migrating fish if fish ladders are put in with the dams remaining in place. The EIR should analyze the impacts of the dams to these potential refugia, how these refugia would benefit fish if dams were removed, and how the Thermal Refugia Protection Policy of the Klamath River TMDL applies to these potential refugia.

"The Thermal Refugia Protection Policy provides enhanced protection of thermal refugia along the mainstem Klamath River and in the lower Scott River. Thermal refugia are typically identified as areas of cool water created by inflowing tributaries, springs, seeps, upwelling hyporheic flow, and/or groundwater in an otherwise warm stream channel offering refuge habitat to cold-water fish and other cold water aquatic species." (*Action Plan for the Klamath River Total Maximum Daily Loads, April, 2010 pg. 4-9* Hereinafter, TMDL Action Plan)

"Regional Water Board staff shall place heightened scrutiny on permits and 401 water quality certifications for activities that have the potential to impact the function of thermal refugia". *(Ibid.pg.4-11***)**

The EIR needs to analyze the water temperature increases caused by discharges from the Iron Gate Hatchery and the resulting impacts to salmon

The TMDL Action Plan states: "The Iron Gate Fish Hatchery is the one point-source heat load in the Klamath River watershed. The interstate water quality objective for temperature prohibits the discharge of thermal waste to the Klamath River, and therefore the waste load allocation for Iron Gate Hatchery is set to zero, as monthly average temperatures." (*TMDL Action Plan, p4-3*)

The same document further describes how the cold water pool in the Iron Gate reservoir is needed to support the Iron Gate hatchery. This support reduces the cold water that is available to manage water temperature in the Klamath River downstream of Iron Gate Dam. The EIR needs to disclose and evaluate thermal loading of water as it passes through the hatchery, as well as the impact of the hatchery on cold water fisheries and fish disease dynamics. The EIR should also address thermal benefits of the hatchery going offline if dams are removed.

The EIR must disclose and analyze the effects of the project on spring-run Chinook salmon and on fish species composition in the Klamath River.

The EIR should analyze how dam operations, including hatchery operations, have impacted spring-run Chinook salmon and salmon composition in the Klamath River, and how effective dam removal and other alternatives would be in reducing or eliminating these impacts.

In its Application, PacifiCorp rarely mentions impacts to fish species composition from the dams and associated water quality conditions, hatchery operations and blockage of fish passage. No species has been more impacted by the dams' operations then spring-run Chinook: the operation of the dams has reduced their habitat and numbers substantially. Changes in species composition of fish in the river, especially the reduced numbers of spring-run Chinook, have greatly impacted beneficial uses. Hatchery production has not fulfilled promises to replace impacted populations. Dam removal is the best option to recover this species.

The EIR should disclose and analyze the economic impacts of project on commercial and recreational salmon fisheries and on recreational steelhead fisheries, and evaluate the economic benefits of fisheries restoration.

The EIR should disclose and analyze the economic impacts of the project in diminishing fisheries in the Klamath River. It should also disclose and analyze project impacts on commercial salmon fishing in the Klamath Management Zone in the ocean and on from lost recreational fishing opportunities in the Klamath and Trinity rivers. These analyses should consider loss of species abundance, changes in run timing, and lost opportunities due to nuisance toxic algae blooms.

The economic analysis in the FERC FEIS mainly focuses on energy production and is therefore not applicable for this analysis. There is a wealth of studies on this issue that were produced during the FERC and KBRA settlement process. These documents need to be used in the analysis and weighed against power production for a true economic analysis of the Public Trust. We incorporate by reference the comments of the Pacific Coast Federation of Fishermen's Association on economic impacts.

The EIR should disclose and analyze Klamath River water quality and project impacts on water quality (overview).

PacifiCorp's reservoirs in the Klamath River become stagnant and warm, creating temperature, dissolved oxygen, toxic algae and fish disease problems that cannot be mitigated if the dams are left in place. The reservoirs also greatly impact the flow regime of the river by reducing flow and by ramping. The reservoirs block vital sediment recruitment and fish passage for salmon.

Rather than directly disclose and analyze these issues and possible mitigations, PacifiCorp's Application denies impacts and repeatedly blames conditions of Upper Klamath Lake for the water quality impairments in the river. PacifiCorp also takes credit for natural cooling and oxygenating processes that the dams actually partially impede, such as cold water spring input in the J.C. Boyle reach of the river. The SWRCB should fully disclose and analyze these impacts, and require mitigation.

Upper Klamath Lake has major water quality issues. However, impounding this water and every tributary for an additional 64 miles downstream makes water quality conditions much worse and slows the natural recovery of water quality. PacifiCorp states the reservoirs act as nutrient sinks. However water quality is actually the most improved in the free flowing sections of river and where cold water tributaries enter the system unimpeded.

Water quality data and the TMDL analysis that are not included in PacifiCorp's Application show that dissolved oxygen concentrations are regularly too low to comply with Basin Plan dissolved oxygen objectives. (See more detailed discussion below). Water temperature conditions regularly exceed temperature thresholds protective of salmonids. Thermal lag slows cooling in the river so that these conditions have a much greater impact on salmon in the fall. Low dissolved oxygen concentrations and elevated water temperatures in the Klamath River, its tributaries, Copco1 and Copco 2, and Iron Gate Reservoirs, and seasonal algae blooms have resulted in degraded water quality conditions that impair designated beneficial uses. An analysis of these impairments and how beneficial users are impacted under all alternatives and mitigations should be included under all proposed alternatives.

The project impairs the following designated beneficial uses: cold freshwater habitat (COLD); rare, threatened, and endangered species (RARE); migration of aquatic organisms (MIGR); spawning, reproduction, and/or early development of fish (SPWN); commercial and sport fishing (COMM); Native American cultural use (CUL); subsistence fishing (FISH); and contact and non-contact water recreation (REC-1 and REC-2).

The designated beneficial uses associated with the cold freshwater salmonid fishery (COMM, COLD, RARE, MIGR, and SPWN) and Native American cultural use and subsistence fishing (CUL and FISH) are interrelated and are the designated beneficial uses most sensitive to the water quality impairments of the Klamath River. Important species in the Klamath River watershed include Coho and Chinook salmon, trout, green sturgeon, eulachon, and Pacific lamprey. (*TMDL Action Plan, pgs. 4-1 and 4-2*)

The EIR should disclose and analyze the impacts of project reservoirs on water temperature.

The TMDL Action Plan states:

> The Klamath River Temperature TMDL for California relies on an implicit margin of safety. The intrastate water quality objective for temperature allows for temperature increases of up to 5°F if beneficial uses of water are not adversely affected. For much of the year the instream temperature of the Klamath River is too hot to accommodate more heat loading without beneficial uses of water being adversely affected. There are periods in the winter and spring months, however, when temperature increases of up to 5°F may occur without beneficial uses of water being adversely affected. The timing of those periods changes from year to year and is difficult to predict. Therefore, this TMDL takes a conservative approach, allocating no temperature increases year-round. This conservative approach constitutes an implicit margin of safety. (*TMDL Action Plan, p. 4-4*)

Temperature is a major issue in the Certification process and in the related Klamath River Temperature TMDL. PacifiCorp inaccurately states in its Application that there are no temperature violations from its reservoirs because the Basin Plan allows for a 5°F increase over background, and it considers background to be the current degraded conditions.

Any temperature increases are a violation of the Klamath River TMDL, and the TMDL and FERC analysis both establish that background conditions are pre-dam conditions. The Application also has no evaluation of the cumulative impacts of extreme drought conditions when coupled with project operations. The EIR must evaluate TMDL compliance under all the alternatives.

Temperature is also a major issue in the reintroduction process for fisheries above the Iron Gate Dam, along with current conditions for salmon: both should be analyzed in the EIR. Temperature impacts or benefits should be analyzed for all alternatives. PacifiCorp's Application denies or ignores project impacts on the Klamath River water temperature. For instance, though the Application discloses the fact that the reservoirs cause significant thermal lag, it proposes no mitigation to address this issue and suggests that the condition does not impact fish. Other temperature impacts are not even mentioned, though five out of seven of heat loads described in the Klamath TMDL are directly related to, or exacerbated by, the presence of these dams. These loads include:

1. Conditions of Klamath River water crossing the Oregon-California border (Stateline) (Keno reservoir, in Oregon especially is a major factor in this source)
2. Thermal discharges from Copco 2 and Iron Gate Reservoirs,
3. The impoundment of water in the Copco 1, Copco 2, and Iron Gate Reservoirs,
4. Temperature effects of Iron Gate Hatchery, and
5. Excess solar radiation.

The TMDL allocations for temperature increases for the Klamath impoundments, and for receiving water at the state line, both which are subject to this application, is zero. However, PacifiCorp's Application continually relies on a standard that allows up to a 5° Fahrenheit (2.8° Celsius) increase above background. Even with that incorrect assumption, project operations still violate temperature standards. The Application states: "During occasional brief periods in the fall from about mid-September to mid-November, the temperature can exceed the objective by about 0.1 to 1.5°C." (p. 5-83) Using the correct standard (TMDL allocation of zero), the exceedance is 2.9°C to 4.3°C.

Thermal lag and stratification impacts from reservoir releases of warm and polluted water are harmful to fish. Temperature increases from the reservoirs impact the river over many more river miles during dry times of year than the Application discloses. The EIR should analyze how thermal lag and stratification impact temperatures and salmon.

During the summer, the majority of the water coming into the Klamath River is from reservoir releases until cold water tributaries begin to enter the river near Happy Camp. Tributaries between the reservoirs and Happy Camp, such as the Shasta and Scott River, have very low flows during dry times of year. Therefore, during critical times of year, temperature impacts from Iron Gate Reservoir have an even larger negative effect on cold water fisheries in the reach between Iron Gate Dam and Clear Creek than the Application suggests. The EIR should carefully analyze the project's thermal impacts in this reach.

The impoundment and warming of the cold water tributaries between Keno Reservoir and Iron Gate dam also has a major impact on water quality. This area of river transitions between snowmelt-dependent and spring-fed tributaries, and would have a much more significant cooling effect on the river absent the dams.

The EIR should disclose and analyze the impacts of project reservoirs on dissolved oxygen, and should evaluate the effects of oxygen impairment both in reservoirs and in the Klamath River.

The TMDL Action Plan states:

> "Achievement of the nutrient and organic matter allocations at Stateline and the tributary nutrient and organic matter allocations will not result in compliance with the DO and temperature load allocations within Copco 1, Copco 2, and Iron Gate Reservoirs during periods of thermal stratification. Therefore, additional dissolved oxygen load allocations are assigned to the reservoirs for the period of May through October to ensure compliance with the SSOs for DO and temperature objectives within the reservoirs, and ensure support of the cold freshwater habitat (COLD) beneficial use." (*TMDL Action Plan, p. 4-5*)

The Application incorrectly relies on upriver TMDL nutrient actions and unspecified mitigations in the Reservoir Management Plan to combat in-reservoir dissolved oxygen (DO) impairments. Keno Reservoir, the Copco reservoirs, Iron Gate Reservoir, and Iron Gate Hatchery are all listed as dissolved oxygen impairment sources in the Klamath River TMDL's. The reservoirs and hatchery are the only source of dissolved oxygen impairment in the mainstem Klamath located in California. Dissolved oxygen levels are near saturation when they enter the Copco reservoir reach. The EIR should compare each alternative to evaluate how well it will meet TMDL loads and other water quality standards and objectives related to DO. DO has a significant impact on migrating salmonids throughout the Klamath system. The Application addresses DO only in Iron Gate Reservoir, not the other dams. Moreover, the Application proposes dissolved oxygen mitigation measures as part of the Reservoir Management Plan that are largely untested and theoretical, and that do not include an analysis of cost.

The Application states:

> From mid-summer through mid-fall, the dissolved oxygen levels in the releases to the river

> from Iron Gate reservoir are typically more variable, ranging both above and below saturation, with minimum values in late September to early October (Figure 5.2-5). The more variable and lower dissolved oxygen conditions in the August-October period reflect: (1) the production and respiration effects from algae blooms at this time; and (2) the increase in subsaturated conditions that occur in deeper waters of Iron Gate reservoir during this period that can at times be entrained into the powerhouse intake. (Application, p. 5-59)

While there is some seasonal impairment in the Klamath River downstream of Iron Gate Dam due to the release of reservoir water with low dissolved oxygen levels, it is likely that the greatest impact of DO impairment in both reservoir and river stems from development of toxic algae in conditions of dissolved oxygen impairment. The EIR should pay particular attention to this phenomenon, as discussed further below.

Dissolved oxygen mitigation measures as proposed as part of the Reservoir Management Plan are largely untested and theoretical, and do not include an analysis of cost. The EIR needs to include actual proven and concrete mitigation measures that will meet TMDL loads and water quality standards for DO throughout the year.

The EIR should disclose and analyze the impacts of project reservoirs and operations on fish pathogens and disease.

The FERC FEIS states:

> The Klamath Hydroelectric Project has likely contributed to conditions that foster disease losses in the lower Klamath River by (1) increasing the density of spawning adult fall Chinook salmon downstream of Iron Gate Dam; (2) promoting the development of attached algae beds that provide favorable habitat for the polychaete alternate host for *C. shasta* and *P. minibicornis*; and (3) contributing to water quality conditions that increase the stress level of juvenile and adult migrants and increase their susceptibility to disease. (FERC FEIS, p. 3.309)

The EIR should analyze how each alternative will affect water quality conditions that increase the stress level of juvenile and adult migrants and increase their susceptibility to disease, and how they impact the attached algae that provide for polychaete worms. We believe this analysis will show that dam removal alternatives would combat juvenile fish disease issues and also greatly reduce adult fish disease issues in the Klamath River.

Elevated water temperatures in the Klamath River not only encourage algae blooms, but also encourage warm-water parasites like *Ceratomyxa shasta* and *Parvicapsula minibicornis*, which are fatal to many juvenile salmon, resulting in the mortality equivalent of a major fish kill nearly every year. Currently these diseases result in high rates of juvenile salmonid mortality. In years of extreme drought such as 2015, up to 90% of juvenile salmon have contracted the *C. shasta* virus.

Ceratomyxa shasta and *Parvicapsula minibicornis* are both virulent warm-water parasites that are simply more active in the warmer river waters that now occur every summer for longer periods than historically occurred. Juvenile fish are especially vulnerable to these virulent pathogens. When juvenile salmonids contract either of these virulent fish diseases, it is frequently fatal, even more so when juvenile fish (as is all too common) contract both.

Rapidly moving gravel naturally cleans the river bed of algae, and thus reduces the growth and prevalence of the algal species that harbor (and are the major food sources) for the polychaete worm *Manayunkia speciosa* that is the disease vector for *Ceratomyxa shasta.* The *P. minibicornis* pathogen has a similar complex lifecycle.

Warm water and low dissolved oxygen are also major factors that cause fish diseases in the adult run of salmon. Adult fish disease issues have been rampant in the Klamath River in the majority of the last ten years due to low flows and warm water. This has led to many emergency actions such as the release of cold water from the Trinity River. Studies prove that water quality conditions are the most important factor in avoiding fish diseases in adult salmon.

We incorporate by reference the technical comments on fish diseases of the Klamath Tribal Water Quality Consortium, Dr. Joshua Strange and the Yurok Tribe.

The EIR should disclose and analyze the impacts of project reservoirs and operations on toxic algae.

Microcystin is a 303(d) listed impairment for the Klamath River. This toxin is dangerous not only for humans but all for all wildlife, stock animals and pets that utilize the Klamath River. The Iron Gate and Copco reservoirs create this algae and release *Microcystis aeruginos,* and its associated toxin *Microcystin* from Iron Gate Dam, which in turn pollutes the entire river, including the estuary, for several weeks a year. This has a huge economic, subsistence and cultural impact on the people that live on, or rely on, the Klamath River. This should be disclosed and addressed as part of the EIR. Despite numerous studies and ten years of data showing toxic algae levels are the highest in the world, PacifiCorp still calls the impairment common, and its Application dismisses its part in causing this nuisance. Even without studies, the people on the reservoirs and rivers can see that the foul-smelling bright green water is a dangerous nuisance.

Documents from numerous sources are emphatic about the prevalence of *microcystis* and other toxic algae in the Klamath system. These documents point out the central role of project reservoirs in promoting the presence of these organisms, and the severity of their impacts.

For example, a North Coast RWQCB staff report for the Klamath River TMDL found:

> The primary impact of the reservoirs as a source area (aside from temperature impacts already described) is their role in creating biostimulatory conditions leading to high levels of chlorophyll-a and blue-green algae (including microcystin), and the oxygen deficits found in the hypolimnion during the summer months." (North Coast RWQCB March 2010 4-26 Staff Report for the Klamath River TMDLs, the Klamath River Site Specific Dissolved Oxygen Objective, and the Klamath and Lost River Implementation Plans, . pgs. 4-26 and 4-27Available at: http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/100927/staff_report/05_Ch4_Pollutant_Source_Analysis.pdf)

The same report notes:

> Chlorophyll-a and blue-green algal related targets are achieved above the reservoirs but not within the reservoirs, thus the slower and warmer waters in the reservoir reaches are the

> cause of these impairments. These conditions are demonstrated previously in Section 2.4 of this document. (*Ibid*, p. 4-26)

The previously cited 2011 Klamath Water Quality Assessment found:

> Of the many factors that may influence these blooms, the removal of the lacustrine (reservoir) environments behind the dams is likely to have the most pronounced influence. Removal of the reservoirs would eliminate optimal habitats for the growth and proliferation of toxigenic nuisance algal species such as *Microcystis aeruginosa*. (*Assessment of Long Term Water Quality Changes for the Klamath River Basin Resulting from KHSA, KBRA, and TMDL and NPS Reduction Programs*, August 2011, p. 13).

Still another independent report found:

> The results of the 2005-2008 sampling program demonstrated widespread and high abundance of toxigenic MSAE blooms in Copco and Iron Gate reservoirs and in the Klamath River downstream, exceeding World Health Organization Moderate Probability of Adverse Health Effect Levels (WHO MPHAEL) for both cell density and toxin by 10 to over 1000 times. Although both cell density and toxin data indicated that MSAE cells and microcystin were either not detectable or detected at very low levels in the Klamath River directly above the reservoirs, levels of both parameters increased directly below the reservoirs in all years. In addition, bioaccumulation studies undertaken in 2007 and 2008 showed accumulation of microcystin toxin in muscle and/or liver tissues of yellow perch, hatchery salmon, and freshwater mussels (Mekebri et al. 2009; Kann 2008; Kanz 2008). Microcystin levels in biota exceeded public health threshold values for safe consumption (Kann 2008; OEHHA 2008)" (*2009 Toxic Cyanobacteria Summary June 2010 Aquatic Ecosystem Sciences LLC*, p. 5. Available at: http://www.klamathwaterquality.com/documents/kann_et_al_2010_Karuk_Public_Health_Cyano_2009_Report_6-30-10.pdf)

The same report noted: "These blooms were associated with high levels of microcystin, a potent hepatotoxin capable of causing chronic liver damage and acting as a tumor promoter." (*Ibid*, p. 5)

This report concludes:

> "Overall MSAE and microcystin levels increased from July through September with a decline occurring in mid August (Figure 3). On 9/28 CRCC had a microcystin concentration of 36,000 µg/L and CRMC had a microcystin concentration of 73,000 µg/L, both exceeding the public health TDI by 10,000x (Figure 3). The 73,000 µg/L microcystin level is the highest observed for these systems to date, and represents maximum world-wide observations." (*Ibid*, p. 12)

PacifiCorp blames upriver water quality impacts for this impairment, and claims that it does not diminish recreation (Application Page 5-6). As mitigations for these water quality violations PacifiCorp proposes the Reservoir Management Plan, which includes no concrete actions and instead proposes more studies and planning. This plan relies on actions that have proven ineffective over the past eight years of interim measures and on potentially dangerous actions such as use of

algaecides, which could actually add to the problem by releasing algal toxins.

The EIR should diligently review available information, and carefully analyze all alternatives and their impacts in producing toxic algae. The EIR must find any proposed mitigations for reservoir management meant to mitigate for toxic algal production to be proven effective. The EIR should also include an economic analysis both of the costs of mitigation and the costs of the unmitigated impairment. If toxic algae impacts can not be mitigated a final permit should require dam removal.

The EIR should disclose and analyze the impacts of project reservoirs and operations on nutrient loading.

The EIR should evaluate the claim that project reservoirs are aiding water quality by retaining nutrients. As stated above, while it is may be true that the Klamath reservoirs do retain some nutrients, analysis will likely show that this nutrient retention does not actually aid the river in the way that natural conditions would through dilution, scour, and impacts on periphyton growth and thus fish disease. The dams actually change nutrient dynamics in way the is harmful to beneficial uses within the Klamath. Furthermore, nutrients can be transferred from sediment on the bottom of reservoirs and releases in water column under high wind conditions, or times of high Ph values, and blue green algae can release high nitrogen releases.

Klamath River TMDL's identifies several ways other ways in which the nutrient capture dynamic impact the Klamath River. These are:

- The effect of retaining the nutrients within the reservoirs with respect to contributions to the nuisance algal conditions in the reservoirs.
- The net retention of nutrients within the reservoirs can be substantial -rich conditions downstream of Iron Gate Dam.
- It is clear that the reservoirs spread out event-driven spikes of nutrient loads. However, this is not necessarily a good thing in regard to algal response in the lower river. Without the impoundments, some of the nutrient load would move in event-driven pulses, and a good portion of such loads would flush through the system without elevating concentrations for long enough or at an appropriate time of year to promote elevated periphyton growth."

(*North Coast RWQCB March 2010 4-26 Staff Report for the Klamath River TMDLs, the Klamath River Site Specific Dissolved Oxygen Objective, and the Klamath and Lost River Implementation Plans*, *ibid*, p. 4-26)

Conclusion

In summary, we request that the EIR include the issues we have discussed in these comments, and that it meet our requests for disclosure and analysis.

Overall, we request the draft EIR for this project include alternatives that evaluate the removal of four or five dams as the preferred alternative, that the Reservoir Management Plan be deemed as insufficient mitigation, and that unless the final Certification includes such includes dam removal, that Certification be denied.

Thank you for the opportunity to comment on scoping for the Environmental Impact Report (EIR) for the issuance of a Water Quality Certification for the Relicensing of the Klamath Hydroelectric Project (FERC No. 2082).

Respectfully submitted,

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