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ARCHITECTURE

March 21, 2015

Peter Barnes
Engineering Geologist
State Water Resources Control Board
Division of Water Rights, Water Quality Certification Program
P.O. Box 2000
Sacramento CA 95812-2000

Re: Comments on Draft Environmental Impact Report (EIR): Upper North Fork Feather River Hydroelectric Project, FERC #2105

Dear Mr. Barnes:

Our family has owned property on the East Shore of Lake Almanor since 1951. During this time we have had ample opportunity to observe environmental conditions at the lake and throughout the North Fork of the Feather River Basin. I am aware of the interrelationship of power generation, water quality and stewardship of the land at Lake Almanor. In that spirit I reviewed the above referenced Draft EIR which proposes the construction of two thermal curtains (Alternatives 1 & 2) at Lake Almanor and the Caribou Intake at Butt Valley Reservoir. The purpose of these curtains would be to transfer cold water from the lakes into the Belden Reach of the Feather River system during the summer months in an attempt to lower downstream summer flow water temperatures.

The Draft EIR states installation of the thermal curtains would have a less than significant environmental impact on Lake Almanor. While I understand the ambitions of the project I believe the alternatives proposed in the Draft EIR require substantial further study. The Draft EIR has not identified all the potential impacts associated with the alternatives and does not have sufficient data to reach a less than significant impact conclusion. My comments on the Draft EIR include the following.

The Proposed Thermal Curtain is an Untested Ecological Experiment: The proposed thermal curtain is an untested ecological experiment being placed at the environmentally sensitive most upstream source of the North Fork of the Feather River. Precedent studies for similar thermal curtain systems located in environments the same as Lake Almanor and the Belden Reach have not been studied or presented for comparative analysis. Will predicted water temperature reductions actually be sustained in Belden Reach if colder Almanor water is introduced? What if the predicted temperatures do not achieve required objectives? Will the answer be to drain more cold water from Lake Almanor? Engineering models often fail to predict long term performance or identify the unintended consequences of actions in complex fluid dynamic systems. The proposed thermal curtain approach maybe a long shot. Lake Almanor is a unique

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natural resource not the subject of an environmental fix seemingly engineered to resolve longstanding water policy and power generation issues. Long term operational studies of other similar installations and locations should be assessed prior to recommending this approach for Lake Almanor.

The Project Alternatives Section Does not Address a Failure of the Thermal Curtain

Alternative: The Project Alternatives section assumes success. It neglects to address a Failure of the Thermal Curtain Concept Alternative. Should the thermal curtain experiment not work i.e. the Belden Reach water temperatures do not adequately decrease due to causes unrelated to the Lake Almanor cold water injection, or result in unintended negative ecological or water quality consequences in Lake Almanor, how will the process be reversed or rectified? *None of the proposed mitigation measures require PG&E to remove the thermal curtains should the experiment fail.* The Project Alternatives Section of the document should address this potential eventuality.

Extended Periods of Severe Drought Needs to be Modeled: The Draft EIR does not study the cumulative impacts on water quality, water temperature and dissolved oxygen (DO) levels in Lake Almanor or Belden Reach based on nonstandard weather models such as extended periods of severe drought. The impacts of global warming is obvious in Northern California including larger and more numerous forest fires, forest cover die off by bug kills, and increased levels of erosion and sedimentation due to reduced forest cover. The continued existence of drought may be the new normal and significantly alter the predicted effects on water quality in Lake Almanor and Belden Reach potentially exacerbated by the proposed thermal curtain installation.

More Detailed Limnology Studies Necessary: Global warming induced average daily temperatures gains within the Belden Reach may also increase the temperature of the underlying geology and associated overlying river flow there in spite of the addition of colder waters from Lake Almanor. Lake Almanor in this case will sacrifice its coldwater reserves for naught. The proposed draw down of cold water from the base of Canyon Dam will require replacement water from elsewhere in the lake. This is a fluid and thermodynamic situation. Has the science been studied on this issue? Will the nearby shallower shoreline areas of the lake be negatively affected? Substantial further study is needed.

Mitigation Measure WQ 1 is Incomplete and Lacks Accountability: Water quality mitigation measure WQ 1 proposes monitoring and fish restocking only if lake conditions change due to the thermal curtain program. This mitigation measure requires further definition and teeth including but not limited to identifying the objectives of the monitoring program, the scientific criteria upon which it will be based and the resulting actions to be taken if water quality thresholds are exceeded. Stocking hatchery trout may not be enough. Conditions and action requirements should be placed on PG&E should environmental changes manifest in: lake water quality, DO levels, fish populations, shallow water habitat, fresh water vegetation growth and for other potential environmental and habitat impacts as detected by the monitoring program. A fail safe mechanism is required. As mentioned earlier how will this program be reversed if it fails?

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Implementation of the Alternatives May Include other Potential Impacts that Require Substantial Further Study: Both Alternatives 1 & 2 requires the placement of 7,000 cubic yards of fill material acquired from a local source in the lake. The potential traffic and air quality impacts of quarrying, transporting and placing this fill has not been identified. Assuming each transfer truck and trailer load equals 20 cubic yards it will likely generate 700 round trips of heavy truck travel (to the quarry and return) to complete the work. Considering the fill will be placed in a drinking water source has the quality of the fill material been tested or specified to avoid naturally occurring toxic minerals or other agents being placed in California's water?

The thermal curtain concept also poses recreation and quality of life issues at Lake Almanor. A larger portion of the lake will be off limits to boaters, navigation lights on the curtain booms will be required in a lake area currently dark at night contributing to light pollution and changing the aesthetic tone and context of the area and the impact on coldwater fisheries remains unknown.

Based on the above I am concerned about the merits of the alternatives and urge the State Water Resources Control Board to require substantial further study of the thermal curtain proposal.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael B. Ross". The signature is fluid and cursive, with a prominent initial "M" and a long, sweeping underline.

Michael B. Ross, AIA, NCARB

Principal

RossDrulisCusenbery, Architecture Inc.