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Ms. Kimberly D. Bose, Secretary
FEDERAL ENERGY REGULATORY COMMISSION 888 —
1st Street, N.E. Washington, D.C. 20426-0001**Subject: Upper North Fork Feather River Hydroelectric Project, FERC Project No. 2105; California SWRCB proposed Certification and Water Quality Conditions**

Your honorable Kimberly D. Bose,

This letter is in response to the plan to use water from Lake Almanor to cool water in downstream sections of the Upper North Fork of the Feather River (UNFFR). The State Water Resource Control Board (SWRCB) proposed three alternatives to complying with Condition 6 – Water Temperature Management - of the water quality certification in order to approve licensing of FERC Project No. 2105. Each of the alternatives is intended to add cold water to the UNFFR with the goal of improving cold freshwater habitat (i.e., rainbow trout habitat) by reducing river water temperatures to below 20°C.

Alternative 1 is to release supplemental results of up to 250 cfs from Canyon Dam from June 16 through September 15 and the installation of thermal curtains at the Prattville intake and the Butt Valley Reservoir. Alternative 2 is to install thermal curtains without supplemental releases from Canyon Dam. Alternative 3 consists of stand-alone releases from Canyon Dam of 250 cfs from June 16 through September 15. One of the main problems with these proposals is that there is very little scientific evidence indicating that achieving that goal will achieve any improvement to the rainbow trout habitat, or the health of the cold water species in the river.

It is far better to fix the things that are causing the problem of insufficient cold freshwater habitat (primarily rainbow trout) in the river rather than change things that are not causing the problem. Wasted resources spent in an attempt to slightly modify the river temperature could much better be used to improve the habitat in the tributaries and river basin. The regulations require “reasonable” accommodations to reduce negative environmental impacts of actions. The “action” under consideration is the re-licensing of an existing project. Spending a lot of money, and putting a healthy lake at risk, is not a “reasonable” because it is unlikely to have a significant positive impact on an unknown problem.

After studying the various documents provided by the SWRCB I conclude that there are several major problems with the modeling and hence the development of the three alternatives. In addition, according to top scientists in the field, issues with the rainbow trout populations in the river (if any

issues exist) are far more likely to be the result of problems in the tributaries and the river basin itself than the slightly elevated average river temperature during a couple of months in the summer.

The following discussions summarize a few important concerns with the proposed alternatives imposed by the SWRCB as conditions for re-licensing project 2015:

- 1) It is not at all clear that reducing the water temperature in the river by approximately 1 or 2 degrees during the summer months will significantly improve fish habitat for fish or other organisms. The stated goal is to improve cold water fish habitat (represented by Rainbow trout) in the UNFFR enough to cause a "rebound" in fish populations as might have existed prior to the installation of the dams and associated power plants on the river. (The population size is a conjecture; there is no substantiated evidence of what those populations might have been.)
- 2) Studies have shown that the optimal temperature environment to achieve maximum growth and vigor for rainbow trout isn't one that is constantly below 20°C but rather one with daily fluctuations between approximately 17°C and approximately 24°C. Spending some time in "warm" water (up to approximately 24°C) appears to be beneficial to trout. A single cutoff temperature, such as 20°C has very little value for determining the best environment. (The single value appears to have come from an old source that was very likely based more upon a "hunch" than solid scientific studies.)
- 3) The health and abundance of rainbow trout in the UNFFR is determined to a large extent by the habitat within the many tributaries to the river. These tributaries are the locations where spawning occurs and where fish grow to adult size. Once fish grow sufficiently, they enter the river proper, but spend much of their time congregating around the many underwater streams providing "pools" of cold, fresh water.

The key to improving rainbow trout habitat is to focus on the many tributaries that act as nurseries for the fish. Once the trout are mature enough to enter the river proper they are capable of finding "micro-environments" suitable to their needs. Changing the average temperature of the river by a degree or degree and a half is unlikely to have any significant impact up the suitability of the river for cold water fish, including rainbow trout.

- 4) The target temperature of less than 20°C does not appear to be based upon any consideration of the habitat, the fish or the environment. The target appears to be based upon meeting a requirement in a regulation. There is no evidence that the fish population is stressed, endangered or smaller than it should be to maintain a healthy balance within the river system.
- 5) The studies cited in the EIR don't indicate that there is a degraded or damage fish population, but do indicate that if there is such a degradation that it could be caused by a number of causes including lack of adequate gravel beds for spawning, the introduction of non-native predatory fish, the lack of sufficient shading opportunities, warm water, etc. There is no evidence

provided concerning whether or not any of these possible issues exist, or if they actually degrade the fish environment. The only evidence provided is that the average water temperature is higher than the regulation for a few weeks a year.

High water temperatures during the months of July and August are identified as possible contributing factors, but no evidence is provided to indicate which of the possible factors are most important or which factors should be improved for the most cost effective, and environmentally sound, solution.

- 6) It is well known that the biggest impact upon the health and success of rainbow trout in the UNFFR depends upon the conditions of the many small tributaries. Several simple, relatively low cost solutions have been proposed by the American Indians native to that area. PG&E has offered financial (five million dollars) and other support to assist them in implementing those proposed solutions. However, the State Water Board (SWRCB) turned those solutions down, apparently because they are not in the SWRCB's jurisdiction. The SWRCB appears to only be interested in solutions that they can mandate and control, not necessarily solutions that improve the ecosystems, fish habitat or the fisheries of the river.
- 7) The temperature studies of the impacts of removing large volumes of cold water from Lake Almanor were almost exclusively focused on the impacts to the cold water rainbow trout habitat in the lake. The proposed "solution" to the predicted large scale rainbow trout kills is to periodically stock the lake with hatchery raised, "catchable" rainbow trout. The studies did not address impacts upon other organisms requiring a consistent cold water habitat. Based upon available documentation, it seems that no comprehensive studies were performed concerning the changes to the warm water portion of the lake.

A significant concern is the potential for increased water temperatures resulting in a significant growth of algae. The existence of algae blooms would in turn change the albedo of the water, making the water darker and therefore absorbing more solar radiation – resulting in a feedback loop of further warming the water, thereby increasing the algae... This type of feedback loop has the potential to result in yet another lake becoming a giant green pond (similar to what has happened to Clear Lake in Clear Lake County).

- 8) The studies and modeling described in the EIR used to determine the impacts for the various alternatives were performed almost 20 years ago, based upon weather history up to that time. Apparently no attempt was made to forecast future climate conditions caused by global warming. The highly optimistic proposals were based upon an assumption that each of the three alternatives could potentially lower the river temperatures to below 20°C (an approximately 1.5°C reduction in temperature). It is my understanding that new models based upon the projected "global warming" weather regime have predicted a much lower reduction in temperature, closer to 0.25°C – which is insufficient to move the river temperatures into the "safe" zone. If the newer projections are true, then there is little to be gained by either of the

three proposed alternatives for removing cold water from Lake Almanor – none of the alternatives are worth the taking the unknown risks introduced to the Lake Almanor hydrologic system.

SUMMARY and CONCLUSIONS:

It is unlikely that decreasing the average temperature of small sections of the North Fork of the Feather River (UNFFR) by a degree or two will result in any measureable improvements to the fish habitat in those sections or in the entirety of the river. However, there is a very real and significant risk to Lake Amanor associated with changing the thermal characteristics of the lake. Until much better, up-to-date modeling of the broader potential impacts of the proposed changes “prove” that the risks to the lake are less than the benefits to the river, then it is not appropriate to “experiment” on a functioning system. The potential for a minor improvement to the river environment do not justify the risks associated with removing the cold water from Lake Almanor, especially in light of the possibility that decreasing river water temperatures might actually result in a poorer environment for the fish.

New information indicates that the new weather conditions associated with global warming will result in less than a 0.25°C reduction in river water at the critical locations on the UNFFR. This is not enough to result in a significant improvement to the fish in the river, but will certainly result in significant degradation of fish habitat in Lake Almanor. The correct approach from an environmental point of view is to focus on the habitat on the UNFFR rather than focusing on an attempt to lower the temperature of the river beyond what is feasible, reasonable or practical given the forecast global changes to weather conditions. The lake should not be put at risk in an experiment that perhaps a slight drop in water temperatures at a few locations on the river will result in a significant (or measureable) improvement to the fish.

As a minimum, the studies supporting the EIR should be repeated based upon new estimates of future weather conditions, using newer more accurate models. The modeling needs to be expanded in scope to include all of the impacts to the lake environment, including impacts on the warm water environment and impacts on cold water species beyond rainbow trout. The potential impacts upon the river cold water species should be further investigated to better determine the overall anticipated improvements due to changes in water temperature caused by the three alternatives. In addition, additional habitat improvement alternatives (such as those proposed by the local Native American tribe) should be investigated to determine impact, cost and feasibility.

Respectively,



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