APPENDIX 4

U.S. FISH AND WILDLIFE SERVICE CONCURRENCE

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2013-I-0368

August 2, 2013

Memorandum

To: Field Manager, Bishop Field Office, Bureau of Land Management, Bishop, California

/s/: Stephen P. Henry

From: Acting Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California

Subject: Casa Diablo IV Geothermal Development Project, Mono County, California (6841 CA-170.30 (P))

We have reviewed your memorandum, dated July 12, 2013, and received by our office via electronic mail on July 15, 2013, requesting initiation of informal consultation on the subject project. The proposed project would involve the construction, operation, maintenance, and decommissioning of a 33-net megawatt geothermal power generating facility and related infrastructure. The proposed project is located on U.S. Forest Service (Forest Service) land east of U.S. Highway 395 and approximately 0.5 mile to the northwest of 3 existing Casa Diablo geothermal power plants that are located approximately 2 miles east of the Town of Mammoth Lakes. The Forest Service manages the surface estate whereas the Bureau of Land Management (Bureau) manages the subsurface estate. The Bureau is the lead Federal agency for the proposed project and the Forest Service is a cooperating agency. Your biological assessment included a complete project description of the proposed action and two alternatives. In a letter, dated August 1, 2013, you clarified that Alternative 3 was the preferred alternative and, therefore, the proposed action for consultation under the Endangered Species Act. In regards to this consultation, we will only consider the effects of the proposed action or, in this case, Alternative 3. The Bureau has determined that the subject project is not likely to adversely affect the federally endangered Owens tui chub (*Gila bicolor snyderi*) and its critical habitat. Your request and our response are made pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended.

In 1988, the U.S. Fish and Wildlife Service (Service) issued a biological opinion to the Bureau regarding the potential effects of proposed geothermal activities at Casa Diablo Hot Springs (1-1-88-F-3) on the Owens tui chub and its critical habitat at Hot Creek headwaters (known as AB and CD springs). At the time, the agencies did not have sufficient information to determine the effects the proposed geothermal development activities would have on the subsurface flow of geothermal fluids toward the Hot Creek headwaters, including effects to the thermal component of that flow. The Service assumed the "worst-case scenario" could occur, which was based on the Lateral Flow Model. This model was one of two developed to explain how geological

processes in this area may affect subsurface movement of geothermal fluids. This model assumed that the Casa Diablo geothermal reservoir was the principle source of surface hydrothermal activity in the surrounding area and that geothermal production could inhibit the lateral movement of the geothermal fluid and result in pressure and temperature declines. The primary concern about the project was the potential reduction in temperature at the Hot Creek headwaters, which contained two of three to four populations of the Owens tui chub. The Service determined that this project, which included nine stipulations to avoid potential temperature changes at the Hot Creek headwaters, was not likely to jeopardize the continued existence of the Owens tui chub or adversely modify its critical habitat at the Hot Creek headwaters.

Since the early 1980s, the U.S. Geological Survey has conducted hydrologic monitoring in and around the project area. The Long Valley Hydrologic Advisory Committee was formed to advise participants (e.g., the Bureau; Forest Service, U.S. Geological Survey; California Department of Oil, Gas and Geothermal Resources; California Department of Fish and Wildlife; and County of Mono) on how to manage the Long Valley geothermal resources. Monitoring data collected by the U.S. Geological Survey indicate that precipitation, snow melt, groundwater recharge, and magmatic activity affect temperature and flow rate of surficial geothermal features to a greater extent than pressure reductions in the geothermal reservoir.

Within the action area for this consultation, the Owens tui chub occurs at AB and CD springs and Little Hot Creek Pond. AB and CD springs are designated critical habitat for this species. The primary constituent elements of critical habitat for the Owens tui chub are high quality, cool water with adequate cover in the form of rocks, undercut banks, or aquatic vegetation and a sufficient insect food base (50 Federal Register 31592, August 5, 1985). The proposed project is located approximately 2 miles from Owens tui chub critical habitat at AB and CD springs and 5 miles from Little Hot Creek Pond; therefore, the proposed action will not directly affect the Owens tui chub or it critical habitat. However, the Bureau acknowledges that the proposed project could indirectly affect the Owens tui chub and critical habitat by potentially altering the rate of flow, temperature, or chemistry of the water that reaches the springs that supply AB and CD springs and Little Hot Creek Pond.

The following discussion focuses on changes to temperature and water quality, which are primary constituent elements of the species' critical habitat. Using historical temperature and pressure monitoring data, a numerical model was developed to evaluate future impacts to the hydrologic and geothermal resources from the cumulative geothermal production activities. The model predicted that the thermal outflow to the Hatchery Springs (includes AB and CD springs) could be reduced by approximately 17 percent, which would reduce the temperature up to 1.5 degrees Celsius over a 30-year period. However, the thermal outflow to Hatchery Springs is less than 5 percent of the total flow; therefore, the combined cold and thermal discharge at the springs would be reduced by 0.85 percent. The predicted reduction in the mean temperature at AB and CD springs would occur within the normal range of variation experienced by the Owens tui chub. The Bureau did not determine the extent to which the thermal outflow to Little Hot Creek Pond would decrease; however, because the distance between Little Hot Creek Pond and

the geothermal wellfield is greater than that between AB and CD springs and the wellfield, the Bureau concluded that the decrease in thermal outflow at the pond would be less than that at the springs (i.e., less than 0.85 percent). In regards to water quality, the historical monitoring data indicate no significant changes in water chemistry have occurred and the model predicts a minor (i.e., less than 1 percent) change.

In addition to the monitoring conducted by the U.S. Geological Survey, the Bureau has proposed a habitat and population monitoring plan that would include surveys of the Owens tui chub, benthic macroinvertebrates, and aquatic and riparian vegetation at AB and CD springs and Little Hot Creek Pond. The data collected from these surveys will be analyzed in conjunction with water quality data. Additionally, the Remedial Action Program, which was completed in 1990 and provides detailed methods to meet the requirements of the 1988 biological opinion, would be amended to include specific measures to address any changes in Owens tui chub populations and the primary constituent elements of its critical habitat that may be caused by the proposed project. The amended Remedial Action Program would be developed in coordination with the Bureau; the California Department of Fish and Wildlife and Service would be invited to participate.

The remaining primary constituent elements of critical habitat of the Owens tui chub are adequate cover in the form of rocks, undercut banks, or aquatic vegetation, and a sufficient insect food base. The potential small changes in water temperature and quality that the Bureau anticipates from the proposed project would not affect rocks or undercut banks that provide cover for the Owens tui chub; the Bureau does not anticipate changes in the quantity of water that would be required to alter these components of the primary constituent elements. The predicted temperature declines would occur within the natural variations experienced by aquatic vegetation and insects, which serve as cover and a food source for the Owens tui chub. A temperature decrease of the predicted magnitude would not result in increasing prey-capture rates for rainbow trout (*Oncorhynchus mykiss*), which compete with the Owens tui chub for prey and are predators of their fry and eggs.

We concur with your determination that the proposed project is not likely to adversely affect the Owens tui chub or its critical habitat. We have reached this conclusion because the proposed action will not directly affect either the Owens tui chub or its critical habitat. Indirect effects to the Owens tui chub would only occur through changes to the primary constituent elements of its critical habitat at AB and CD springs or to these same features at Little Hot Creek Pond. We anticipate that the potential changes to the primary constituent elements of critical habitat would be insignificant; that is, we expect that the changes would be so minor that we could not meaningfully measure, detect, or evaluate any change in the function of the primary constituent elements. Because it is farther from the geothermal wellfield than AB and CD springs, the indirect effects at Little Hot Creek Pond would also be unlikely to adversely affect the Owens tui chub indirectly.

Consequently, further consultation, pursuant to section 7(a)(2) of the Endangered Species Act, is not required. If the proposed action changes in any manner that could result in adverse effects

that you have not anticipated or the habitat and population monitoring program indicates the potential for adverse effects to the species or its critical habitat, you should contact us immediately to determine whether additional consultation would be appropriate.

If you have any questions regarding this matter, please contact Erin Nordin of my staff at (760) 872-5020.

cc:
Sarah Tomsky, Deputy District Ranger, Inyo National Forest
Lisa Sims, Fisheries Biologist, Inyo National Forest