



September 2, 2015

Mammoth Community Water District Board of Directors
Mr. Tom Smith, President, and Distinguished Directors
1315 Meridian Blvd.
PO Box 597
Mammoth Lakes, CA 93546

Dear President Smith and Directors:

My name is Randal Peterson, Director of Project Development for Ormat Nevada Inc. (Ormat), developers of the Casa Diablo IV (CD-IV) geothermal power project near Mammoth Lakes, California. This letter provides clarifications to recent statements made by Mammoth Community Water District (MCWD) General Manager, Patrick Hayes, related to discussions aimed at finalizing the Groundwater Monitoring and Response Plan (MRP) for the CD-IV project.

As background, in Section 5.0 of its August 12, 2013 Record of Decision (ROD) approving the CD-IV project, the Bureau of Land Management Bishop Field Manager imposed a condition of approval upon CD-IV that will "...require the development and implementation of a cooperative shallow groundwater monitoring plan focused on detecting any direct or indirect effects on the municipal water supply that may occur from geothermal production and injection in coordination with the Long Valley Hydrologic Advisory Committee." The ROD goes on to invite MCWD to participate in the development and implementation of the cooperative shallow groundwater monitoring plan. It is to this end which MCWD has participated with Ormat, BLM, the United States Geologic Survey (USGS), The United States Forest Service (USFS), and their various consultants in an effort to develop and implement the MRP. It is worth noting that despite the self-imposed challenges encountered in negotiating this MRP, the condition does not require a response plan; only a monitoring plan. The challenges by the MCWD to the ROD and certification of the EIR by the Air Pollution Control Officer (APCDO) have been rejected by both the Interior Board of Land Appeals and Mono County Superior Court, both finding that the analysis of potential impacts to groundwater is adequate in the joint Environmental Impact Statement/Environmental Impact Report. Interestingly, if further appeals were to eventually overturn this ROD or the decision by the APCO, the ultimate outcome could be the necessity to develop an MRP similar to the one we are currently negotiating.

In a series of working meeting among some or all of the parties listed above, the framework of the MRP has been developed. Starting with an Ormat draft MRP in October 2014, Ormat, MCWD and their consultants have commented on and exchanged several draft MRPs. A point of disagreement between MCWD management and Ormat is the need for "deep geothermal" monitoring wells in locations starting at Ormat's Basalt Canyon wellfield and stepping toward the MCWD groundwater wellfield. MCWD proposes a deep geothermal well south of Shady Rest Park, near the recently drilled 28-25A dual-completion monitoring well. MCWD also requests a deep geothermal well at a location behind the Courthouse on USFS land, a location referred to as Project Area 3. In their version of the MRP, MCWD management also suggests that another deep geothermal monitoring well may be required in Ormat's Basalt Canyon wellfield.

The CD-IV Final EIS/EIR finds that "... currently available data indicate that the shallow Mammoth Groundwater Basin is physically isolated from the deeper geothermal system and therefore the project is

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unlikely to affect the quality or availability of shallow groundwater resources.” This opinion was echoed by MCWD’s hydrological consultant, Mark Wildermuth, in his 2009 report to MCWD. During May and June of this year, Ormat performed a scheduled outage of our three existing Mammoth Pacific Limited Partnership (MPLP) geothermal facilities at Casa Diablo. This outage included the shut-down of the two existing Basalt Canyon geothermal production wells and was used, in cooperation with the MCWD, to evaluate well data over a focused time frame. In line with previous data, this test failed to find correlation between pressure changes in Ormat’s Basalt Canyon wellfield and the MCWD production wellfield. It is with this absence of demonstrated need that Ormat approaches the question of deep geothermal monitoring wells.

Nevertheless, Ormat has been consistent in saying that in light of a demonstrated need, and as part of a comprehensive MRP, it will consider drilling deep geothermal monitoring wells. Mr. Bob Sullivan, Ormat’s Executive Vice President, stated as much in a March 4, 2015 meeting held at Wildermuth Environmental, Inc. offices. Charlene Wardlow, Ormat’s Director of Business Development overseeing environmental permitting of the CD-IV project, is quoted in the minutes of the March 25, 2015 conference call stating that “Ormat had agreed to one deep geothermal well.” In our July 7, 2015 meeting at MCWD offices I read a carefully prepared statement, saying: “We will consider one deep geothermal well as part of a comprehensive monitoring and response plan that includes clear indications that it is needed, i.e., groundwater monitoring wells indicate that there is a reason to believe that a groundwater response is noted during the stress test, or other testing. We will not drill them in the absence of evidence that they are actually needed. No fishing expedition; not because it would be nice to know; not because of the absence of information.” Further, since that time, Ormat has returned to the MRP negotiating parties its response to MCWD’s May 13, 2015 MRP revisions. Included in Ormat’s response is the recommendation to drill one deep geothermal monitoring well south of Shady Rest Park next to the recently completed 28-25A groundwater monitoring well.

Ormat’s sensitivity to arbitrarily imposed monitoring or response requirements is that they could impose worst-case-scenario responses to potentially unrelated events. If the MCWD plan had been adopted earlier this year, Ormat would already have been required to mitigate dwindling water resources even though it is obviously the current drought, and not the unbuilt CD-IV project, that is the cause. For this reason, Ormat argues for an adaptive MRP, administered by the Long Valley Hydrologic Advisory Committee (LVHAC), to complement the long-standing hydrologic monitoring program implemented for the existing geothermal facilities at Casa Diablo. The LVHAC is made up of the agencies that regulate Ormat’s geothermal operations and who have regulatory authority to require mitigation in response to unforeseen impacts to groundwater; a concept well understood by these agencies and by Ormat.

In the July 16, 2015 General Manager’s Report to the MCWD, Mr. Hayes reports, “A meeting of the USGS, BLM, USFS, Ormat, and the District and respective consultants occurred on July 7 at MCWD. At this meeting, Ormat’s representative Randal Peterson stated that Ormat was not going to do anything but the two shallow groundwater wells. This is contrary to and effectively reversed all of the progress made over the last seven months. It is a complete renegeing by Ormat on all agreement achieved to that point.” Ormat calls into question Mr. Hayes’ assertions, recalling the statement I read on July 7, 2015.

To conclude the CD-IV section of his July 16 report, Mr. Hayes restates the District’s firm insistence that at least two deep geothermal wells to, among other reasons, “...replace the well they (Ormat) previously destroyed. These data would then be used to attempt to calibrate the geothermal reservoir model.” Through his word selection, Mr. Hayes seemingly attempts to convince the reader that: a) Ormat intentionally destroyed an otherwise perfectly good monitoring well; b) currently there are no wells capable of providing a reference for the effects of pumping; and c) Ormat’s geothermal reservoir model has not been calibrated.

To comment on the first of these statements I must first assume that Mr. Hayes refers to well RDO8, drilled by the Sandia Laboratories in May 1986. The well was drilled as a research well, but due to poor completion



the well was plugged and abandoned in October 2007, according to BLM standards, to mitigate the potential health risks presented by hydrogen sulfide emitted from the well.

Next, referring to wells capable of providing a reference for the effects of pumping in Basalt Canyon, one need only look back to the May 25 to June 6, 2015 reservoir response data review that was facilitated by the shutdown and later restart of existing Basalt Canyon production wells 57-25 and 66-25, mentioned earlier in this letter. During this outage, Ormat and MCWD collected data from their respective well fields. Interestingly, Ormat's deep geothermal monitoring well 12-31, located in Basalt Canyon and measuring pressures in the Bishop Tuff, produced a clear pressure change signal closely tracking the stop and start of the geothermal production wells showing clearly that 12-31 is a suitable deep geothermal monitoring well.

Finally, in response to Mr. Hayes' seeming implication that Ormat's geothermal reservoir model was not calibrated, one must only look as far as the Long Valley Caldera/Casa Diablo Geothermal Reservoir Simulation Model: Peer Review, produced by Dr. Sabodh Garg of Science Applications International Corporation (SAIC), who was retained by the BLM. This peer review was introduced into evidence as part of MCWD's appeal of the EIS/EIR, an appeal subsequently denied in Mono County Superior Court. To quote Dr. Garg's findings on the history match (calibration) of Ormat's numerical model: "To summarize, the numerical model provides an adequate match to the natural state temperatures, pressure history in observation wells, and average temperature history for the produced fluids. Therefore, the model provides a sufficient basis for predicting the response of the geothermal reservoir to future production and injection scenarios."

As you can see, the parties are actually not that far apart on key matters designed to monitor and protect MCWD's water supply while allowing the development of another renewable energy project designed to help reduce global climate change through reduction of greenhouse gas emissions. Ormat is eager to return to the negotiating table to finalize the MRP as conceived and required by BLM's ROD and by Great Basin Unified Air Pollution Control Officer's requirements. I hope that your negotiating team will join us there soon. Please feel free to contact me if you have questions, concerns, or if you want to discuss further.

Sincerely,

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