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DOCKET

09-AFC-8

DATE JUN 25 2010

RECD. JUN 25 2010

California Energy Commission Attn Docket No. 09-AFC-8 1516 Ninth Street, MS-4 Sacramento, CA 95814-5512

Re: Genesis Solar Energy Project; 09-AFC-8

Dear Docket Clerk:

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Enclosed are an original and one copy of **REBUTTAL TESTIMONY OF ERIC D. HENDRIX ON BEHALF OF THE CALIFORNIA UNIONS FOR RELIABLE ENERGY ON SOIL AND WATER RESOURCES FOR THE GENESIS SOLAR ENERGY PROJECT**. Please docket the original, conform the copy and return the copy in the envelope provided.

Thank you for your assistance.

Sincerely,

/S/

Rachael E. Koss

REK:bh Enclosures

2364-089a

STATE OF CALIFORNIA

Energy Resources Conservation and Development Commission

In the Matter of:

The Application for Certification for the GENESIS SOLAR ENERGY PROJECT

Docket No. 09-AFC-8

REBUTTAL TESTIMONY OF ERIC D. HENDRIX ON BEHALF OF THE CALIFORNIA UNIONS FOR RELIABLE ENERGY ON SOIL AND WATER RESOURCES OF THE GENESIS SOLAR ENERGY PROJECT

June 25, 2010

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I. INTRODUCTION

I have been working for the California Unions for Reliable Energy ("CURE") as a consultant on the Application for Certification ("AFC") for the Genesis Solar Energy Project ("Project" or "GSEP") since the data adequacy phase. I have reviewed numerous documents and have conducted my own investigations and analyses regarding the Project's potential impacts on water resources. My testimony is based on the activities described above and the knowledge and experience I have acquired during more than 24 years of working on hydrogeology and engineering geology issues.

The Revised Opening Testimony by Genesis Solar, LLC ("Genesis" or "Applicant") regarding soil and water resources contains proposed Project approval criteria which are contrary to and inconsistent with the technical discussions and statements presented within the Applicant's Opening Testimony dated May 20, 2010. Also the Revised Opening Testimony attempts to counter Staff's proposed mitigation outlined in the Staff Assessment/Draft Environmental Impact Statement ("SA/DEIS") and Revised Staff Assessment ("RSA"), specifically with respect to Conditions of Certification Soil & Water 15 and Soil & Water 19, regarding impacts of Project groundwater pumping on water within the Lower Colorado River and contiguous groundwater basins ("River Aquifer"). Genesis also contradicts and avoids the modified groundwater modeling approach verbally agreed upon by Genesis representatives and their consultants and CEC Staff during a conference call amongst these parties on April 10, 2010. Finally, the Applicant's Revised Opening Testimony misinterprets and misapplies the intent and results of hydraulic modeling by the U.S. Geological Survey regarding Lower Colorado River management "accounting surface" water levels (Wiele, Leake et al, 2008). The Applicant has clearly done this in an effort to avoid implementation of Staffrecommended measures Soil & Water 15 and 19, concerning Project impacts upon the Colorado River.

II. STATEMENT

With respect to Staff-recommended mitigation measures within Soil & Water 15, the Applicant misstates conclusions of the USGS aquifer-depletion modeling effort for the Lower Colorado River Accounting Surface (Wiele, Leake et al, 2008), incorrectly claiming that "...this study shows that most of the CVGB, including the [project] site, is located outside of the area where pumping would deplete the Colorado River, even if pumping were to continue for 100 years." In truth, Figure 6 in Wiele, Leake et al (2008) clearly illustrates that the USGS modeling produces an accounting surface elevation of 238 to 240 feet above mean sea level (msl) across the Palo Verde Mesa Groundwater Basin ("PVMGB") as far west as the flow boundary ("narrows") between the Chuckwalla Valley Groundwater Basin ("CVGB") and the PVMGB. This elevation is only slightly deeper (e.g., from zero to 10 feet) than the

recently-measured water levels within existing wells in the PVMGB (Figure CDR-7-1, Galati & Blek 2010b/Genesis Supplemental filing: Response to CURE Water Resources Data Requests 1-9).

Wiele, Leake et al (2008) opted for the sake of brevity not to illustrate their accounting surface model results beyond the CVGB-PVMGB boundary, but clear evidence exists that this surface reasonably extends beyond the boundary. Given that the CVGB well water levels nearest to PVMGB wells were generally 30 to 40 feet higher in elevation than PVMGB well water levels, and given that Genesis' own consultant acknowledges hydraulic continuity and groundwater flows of 988 AFY across this boundary into the PVMGB (Fig CDR-7-1, Worley-Parsons 2010b; Genesis Responses to CURE Soil & Water Data Requests 1 -9, Item 6), it is reasonable to conclude that the Colorado River accounting surface also extends across this boundary into the CVGB. Genesis' own consultant clearly makes the statement that "...comparison of water levels in similar well pairs suggest relatively consistent underflow from late 1966 to 2000 [between the CVGB and PVMGB]...." (Genesis Responses to CURE Soil & Water Data Requests 1-9, Item 7), and their "gravimetric cross section line H" (Figure CDR-6-2, Genesis Responses to CURE Soil & Water Data Requests 1 -9, Item 6) clearly depicts continuity of the same saturated aguifer units (shallow alluvium and deep Bouse Formation) across the narrows boundary.

The Wiele, Leake et al (2008) study simulates the accounting surface elevations assuming that the Colorado River is flowing under "normal operating conditions," which is defined as the condition when releases by the US Bureau of Reclamation ("USBR") from reservoirs along the Lower River (Mead, Mohave, Havasu) are being made to accommodate downstream requirements where each Lower-Basin State (CA, AZ, NV) is using its full Federal apportionment, plus the 1944 treaty-specified allotment for Mexico. This model "boundary condition" is not presently the case, nor has it been the case for 9 out of the past 10 years due to continuous drought in both the Lower Basin and Upper Basin watersheds.

This drought trend continues. Currently, Lake Mead water levels are at 1,090 feet elevation msl, 115 feet lower than the "normal" operating elevation of 1,205.4 feet assumed in the accounting surface model. Lake Mead is currently at only 42% of capacity, and USBR projects continued declining releases of water from Hoover Dam through at least August 2010, at 65% of long-term average (USBR web site, June 20, 2010). The California Department of Water Resources ("CDWR") reports that average statewide rainfall runoff is still well below (only 75% of) average through end of April 2010 (CDWR, California's Drought Update, May 28, 2010).

As these "boundary elevations" drop in the model due to prolonged drought, so does the River level and the "River Aquifer" level in PVMGB, quite reasonably and possibly below the model accounting surface. Should this occur, the groundwater

gradient across the CVGB-PVMGB boundary becomes steeper, and the groundwater flux out of CVGB could forseeably increase to greater than the 319 AFY simulated by Genesis' consultants as a result of long-term proposed Project wet-cooling operations, leaving less net water budget for the Genesis Project to pump in CVGB. If this occurs, even the *existing* groundwater pumpers in PVMGB could require special entitlements to continue to pump at their previous levels (Wiele, Leake et al, 2008). It should be noted that during drought conditions in the early 1990s, water levels in PVMGB fell below the USGS-USBR accounting surface level of 238 – 240 feet msl elevation (Genesis *Responses to CURE Soil & Water Data Requests 1-9*, Figure CDR-7-1). As a result, it is critical that Genesis evaluate reasonable drought scenarios and uncertainties as part of their mitigation efforts for long-term Project water supply.

In addition to the uncertainties associated with impacts and possible continuation of the present four-year drought, many experts in climate research predict changes in east pacific precipitation patterns due to global warming. Most climate models impacting the Colorado River predict a 5 to 25 percent decline in regional precipitation by year 2050 (McClurg, 2009). Genesis therefore needs to make an allowance in resulting possible and reasonable River Aquifer supply declines in their evaluation for the Project.

Genesis erroneously suggests that a "buried bedrock ridge" barrier exists at the CVGB-PVMGB boundary. As discussed above, continuity of saturated sediments and aquifers occurs across this "buried ridge" is well-established, and the groundwater flow is clearly from CVGB eastward towards PVMGB (Genesis Revised Opening Testimony, page 7, 1st paragraph), and thus into the Colorado "River Aquifer" as established and accepted by USBR and USGS (Owen-Joyce et al, 2000; Wiele, Leake et al, 2008).

Given this well-recognized continuity, the presence of the "bedrock ridge" at the narrows boundary is completely moot. As long as the CVGB recharges the PVMGB and the River, then any additional extractions within the CVGB have the potential to withdraw water from the River, and thus depress the River Aquifer accounting surface. Genesis' own cross-sections (e,g, sections H, I and j) and water level data in the WorleyParsons reports (2010a,b) and also Responses to CURE Data Requests 1-9 clearly depicts the Project pumped aquifer (Bouse Formation) as being in hydraulic continuity across this boundary.

Genesis' new argument regarding the "irrigation recharge mound" in Palo Verde Valley along the River falls short due to its reliance on circular logic. They allege that the mound, which originates due to PVID irrigation, will block any possible hydraulic continuity with CVGB groundwater extractions. There are two problems with the Applicant's argument. First, the irrigation water in the mound comes from pumping groundwater in physical continuity with River (surface) water. If the

River level continues to drop due to a prolonged drought (such as the current one), or long-term climate changes, there is less water available for irrigation and thus a much smaller or even non-existent "mound." Genesis has yet to address the (very likely) scenario where drought lowers both the River level and the groundwater with which it is in contact. Second, the "irrigation mound" occurs within the shallow alluvial ("water-table") aquifer. Genesis previously argued that the shallow aquifer is **not** in hydraulic continuity with the deeper (Bouse) aquifer from which the Project will pump. If this is true, why is a mound in the shallow aquifer even an issue? In contrast, the USBR and USGS treat these two aquifers in the River Aquifer as being in hydraulic continuity (Owen-Joyce at al, 2000). In this case, lowering of the river water surface lowers the water level in **both** aquifers during excessive drought, excessive pumping, or both.

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DECLARATION

I, Eric D. Hendrix, declare as follows:

I have reviewed the above testimony regarding the Genesis Solar Energy

Project. To the best of my knowledge, all of the facts in my testimony are true and
correct. To the extent that this testimony contains opinion, such opinion is my own.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief. This declaration is signed at _______, California.

Dated: 6/24/10

Signed:

PROOF OF SERVICE

I, Bonnie Heeley, declare that on June 25, 2010 I served and filed copies of the attached **REBUTTAL Testimony of Eric D. Hendrix on Behalf of the California Unions for Reliable Energy on Soil and Water Resources for the Genesis Solar Energy Project**. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at www.energy.ca.gov/sitingcases/genesis. The document has been sent to both the other parties in this proceeding as shown on the Proof of Service list and to the Commission's Docket Unit electronically to all email addresses on the Proof of Service list and by depositing in the U.S. Mail at South San Francisco, CA with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list to those addresses NOT marked "email preferred." I also sent a copy via email and an original and one copy via U.S. mail to the California Energy Commission Docket Office.

I declare under penalty of perjury that the foregoing is true and correct. Executed at South San Francisco, CA on June 25, 2010.

	/s/
Bonnie Heeley	

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