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April 20, 2012

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Subject: Data Response, Set 1B-6
Hidden Hills Solar Electric Generating System (11-AFC-2)

Dear Mr. Monasmith:

On behalf of Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC, please find attached electronic copies of Data Response, Set 1B-6.

This data response set is being filed electronically and will be followed up with hard copies. Please call me if you have any questions.

Sincerely,

CH2M HILL

A handwritten signature in blue ink that reads "John L. Carrier".

John L. Carrier, J.D.
Program Manager

Encl.

c: POS List
Project file

DOCKET	
11-AFC-2	
DATE	<u>APR 20 2012</u>
RECD.	<u>APR 20 2012</u>

Data Response Set 1B-6

Hidden Hills

Solar Electric Generating System

(11-AFC-2)



Application for Certification
Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

April 20, 2012

With Technical Assistance from



Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

**Data Response, Set 1B-6
(Response to Data Request 56)**

Submitted to the
California Energy Commission

Submitted by
**Hidden Hills Solar I, LLC; and
Hidden Hills Solar II, LLC**

April 20, 2012

With Assistance from
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Introduction

Attached is Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC (collectively, “Applicant”) additional response to the California Energy Commission (“CEC”) Staff’s data requests number 56 for the Hidden Hills Solar Electric Generating System project (“HHSEGS” or “project”) (11-AFC-2). The CEC Staff served these data requests on November 4, 2011.

Biological Resources (56)

EFFECTS OF POWER TOWERS ON BAT AND BIRD SPECIES

BACKGROUND: In the AFC and two supplements, the applicant addresses the potential for occurrence and project impacts to four bat species, two of which are BLM Sensitive and California Species of Concern, the pallid bat and Townsend's big-eared bat. The applicant identifies the site as supporting potentially suitable night-time foraging habitat for these species, but indicates the likelihood for use of the site for foraging is low due to distance of the project site from roost site occurrences being greater than their known foraging distances. The applicant states that bats or their sign were not observed during field surveys and the site does not provide suitable bat roost habitat, but does not describe the types of bat surveys conducted or how the determination was made that roost habitat does not occur on the project site.

The applicant relied primarily on CDFG's California Natural Diversity DataBase (CNDDDB) occurrence information although that bat occurrence information may not be very complete since bat survey information is not commonly reported to the CNDDDB. Four other special-status bat species identified as occurring within the Northern Eastern Mojave (NEMO) plan area were not addressed by the applicant as potentially occurring and include the occult little brown bat, western mastiff bat, spotted bat, and California leaf-nosed bat which are also identified as California Species of Concern.

Staff needs to analyze the potential for project impacts to roosting and foraging habitat of special-status bats. The applicant has indicated due to lack of roost habitat and low likelihood to forage onsite, impacts are expected to be less than significant and no mitigation would be necessary for special-status bat species. Based on a reconnaissance-level site visit performed by staff in March 2011 and review of aerial photography, staff believes the orchard trees and abandoned home structures located along the southern portion of the project may provide potential bat roost habitat. Based on a conference call between staff and other resource agencies on October 20, 2011, BLM field staff recommends two years of acoustic collection data to provide baseline data for projects on bat species occurrence and habitat use within the project area. Staff believes the site and surrounding area may provide bat roost and foraging habitat and a more in-depth field surveys and data are needed to determine an environmental baseline for determining the project's potential for impacts to special-status bats. While 2 years of data are requested, this will not impact the timeline of the staff's assessment documents. As mentioned previously, the USFWS Regional Migratory Bird Program has indicated there is concern about the effects of large power tower projects to birds, bats, and eagles due to the potential for direct take from the super-heated air surrounding the tower and indirect take due to loss of foraging habitat. The USFWS Region 8 has issued interim guidelines¹ on the development of Avian and Bat Protection Plans and indicate "...of concern are the cumulative effects of renewable energy projects in initiating or contributing to the decline of some bird and bat populations, as well as other affected species."

¹ USFWS, Region 8, Interim Guidelines for the Development of a Project-specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS Region 8 September 2010).

The applicant claims that since the power plant would operate during the day, the potential for impacts to bat species foraging at night over the site is low. Staff needs to analyze the potential for direct and indirect impacts to special-status bats (and migratory bird species) from the project's two 750-foot tall power towers and the heat that will be emitted from the towers; however, the applicant has not provided temperature data expected to be emitted by the towers and over the mirror field.

DATA REQUESTS

56. Please conduct one year of acoustic bat surveys within the site beginning in November 2011. Please coordinate with the resource agencies on the appropriate placement of acoustic unit(s) within the site; report quarterly findings to staff and copy the BLM, CDFG, and UFWS with the information. Once quarterly results of the first year's acoustic survey data becomes available, staff may subsequently request additional seasonal data.

Response: This quarterly report supplements the response to Data Request 55 previously submitted by Applicant on March 5, 2012, and summarizes results for the period of December 25, 2011 to March 31, 2012 ("reporting period"). Bat acoustic surveys are currently ongoing at the HHSEGS site and are scheduled to continue through the end of 2012. The total level of bat activity in this reporting period is very low (Kunz et al, 2007).

Methods

Baseline bat activity in HHSEGS is currently being collected through remote passive monitoring using an AnaBat™ SD1 stationary bat detector. Baseline data collection began on December 21, 2011 and will continue to December 31, 2012. One monitoring station containing a microphone and "bat hat" were posted on the existing HHSEGS met tower at approximately 8 meters above ground. The AnaBat SD1 and associated equipment is protected by a waterproof case. Initially, data was collected on a compact flash memory card. However, on January 24, a remote download system was installed and confirmed as operational. Data gathered on the compact flash memory card and by the remote download system were accessed by a bat specialist.

A mammalogist from O'Farrell Biological Consulting analyzed the AnaBat™ data in 1-minute increments to determine presence or absence of bat species. The mammalogist identified bat species calls based on frequency characteristics, call shape, and comparison with a library of vocal signatures. AnaBat detectors recorded bat echolocation calls with a broadband microphone. The echolocation sounds were translated into frequencies audible to humans by dividing the frequencies by a predetermined ratio. Bat echolocation detectors also detected other ultrasonic sounds, such as those sounds made by insects, raindrops hitting vegetation, and other sources. Analysis of the data files distinguished between files of ambient sounds and bat sounds.

The detection range of AnaBat detectors depends on a number of factors (for example, echolocation call characteristics, microphone sensitivity, habitat structure, orientation of the bat, and atmospheric conditions) (Limpens and McCracken, 2004). Many bats are easily detected over 30 meters (98 feet) under typical conditions, while some species that call at low frequencies may be detectable from as far as 100 meters (328 feet) (Tilley Scientific, 2011). Some bats have louder calls and are more easily recorded. The number of bats

cannot be determined because individual bats cannot be differentiated by their calls. Also, simultaneous bat calls may be recorded as a single pass.

Data analysis uses an Index of Activity (IA) because bat use is not measured directly by AnaBat devices for the reasons described above. The IA is calculated to compare relative levels of activity. It is defined for this report as the number of minutes of bat activity (M) divided by the number of nights of data collection (N) multiplied by 100 ($IA = M/N \times 100$). The quotient is multiplied by 100 to standardize data collected over periods of different lengths. Consequently, minutes of bat activity represent duration of bat activity rather than the numbers of individuals present.

Interim Results

During the reporting period (98 data collection nights), a total of 4,979 files were collected, of which 48 files were identified as containing bat activity. These 48 files represent a total of 46 minutes of recorded bat activity for the reporting period (Table DR56-1). There was no bat activity recorded during the last part of December 2011, or January 2012. Eight minutes of bat activity were recorded in February 2012, and 38 minutes were recorded in March 2012. The calls were analyzed by mammalogist, Dr. Michael O'Farrell, who identified five species of bat. Data are summarized in Table DR56-1.

TABLE DR56-1.

AnaBat™ Acoustic Data in Minutes of Activity Recorded between December 25, 2011 and March 31, 2012 and Calculated Indices of Activity.

Minutes of Activity Recorded		2011		2012		Total
		Dec	Jan	Feb	Mar	
Pallid Bat ¹	<i>Antrozous pallidus</i>	0	0	0	1	1
Big Brown Bat	<i>Eptesicus fuscus</i>	0	0	3	1	4
California Myotis	<i>Myotis californicus</i>	0	0	1	9	10
Western Pipistrelle	<i>Parastrellus hesperus</i>	0	0	1	8	9
Mexican free-tailed bat	<i>Tadarida brasiliensis</i>	0	0	3	19	22
Total		0	0	8	38	46
Number of Nights		7	31	29	31	98
Indices of Activity (IA) ²		Dec	Jan	Feb	Mar	All Nights
Pallid Bat ¹	<i>Antrozous pallidus</i>	0	0	0	3	1
Big Brown Bat	<i>Eptesicus fuscus</i>	0	0	10	3	4
California Myotis	<i>Myotis californicus</i>	0	0	3	29	10
Western Pipistrelle	<i>Parastrellus hesperus</i>	0	0	3	26	9
Mexican free-tailed bat	<i>Tadarida brasiliensis</i>	0	0	10	61	22
All Species Combined ³		0	0	28	123	47

¹ CSC, BLM SS.

CSC = California Department of Fish and Game "Species of Special Concern." This is an administrative designation and carries no formal legal status.

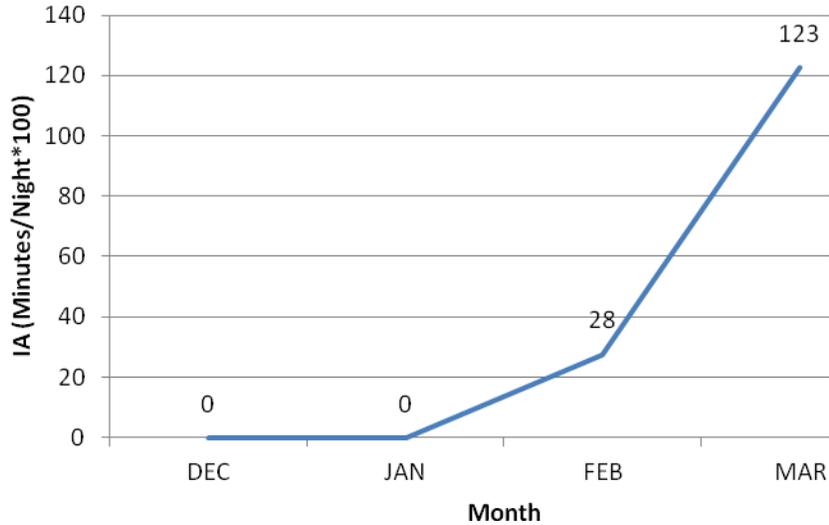
BLM SS = BLM Sensitive Species.

² IA is the Index of Activity (number of minutes of bat activity/number of nights of data collection x 100), which allows a valid comparison of activity across periods of unequal length and/or collection sites.

³ The combined IA is calculated directly from data and is not the sum of species-specific indices. Example from All Species Combined for All Nights: 46 minutes/96 recording nights x 100 = 46.94, rounded to 47.

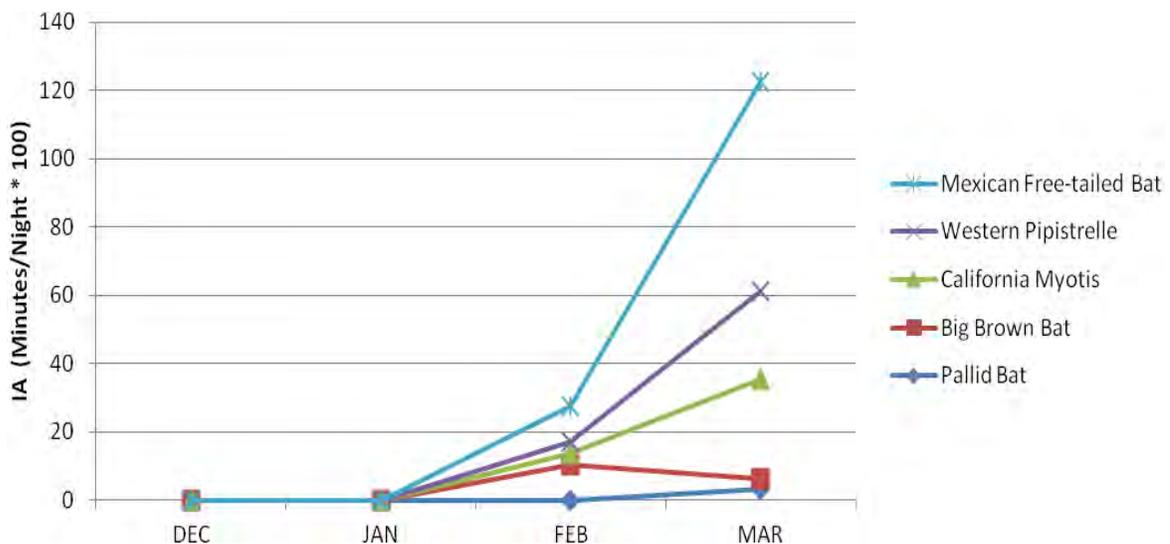
The total bat IA increased from 0 in December and January to 28 in February to 123 in March (Figure DR56-1).

FIGURE DR56-1.
Bat Index of Activity for All species of Bat for Each Month



As bat activity increased approaching the spring season, the IA of each species diverged from the others. The most frequently recorded species was the Mexican free-tailed bat and the least frequently recorded species was the pallid bat (see Figure DR56-2). The IA for only one species, Big Brown Bat, decreased from February to March. However, with so few recorded minutes of activity, this difference may reflect a sampling error and not reflect a trend.

FIGURE DR56-2.
Index of Activity by Month for Each Species



Discussion

The IA does not reflect the number of bats present for a number of reasons. A single bat can make multiple passes. Some species are louder and more easily recorded. Simultaneous calls may be recorded. Consequently, the data is an index for comparison only. The IAs of future data sets will be calculated for comparisons of the relative levels of bat activity at the site over time and will allow valid comparisons of IAs from other sites collected in various seasons (See Table DR56-2 and Figure DR56-3).

The increased IAs in February and March probably reflect a seasonal increase in activity level as bats leave hibernacula. The species recorded to date do not migrate over long distances. Pallid bats and big brown bats do not appear to migrate far as the seasons change. They break into smaller groups and hibernate deep in canyon wall crevices, in buildings, or deep in caves where the temperature is less variable (Harris, 1988). The California myotis may be active at any time of year, although activity is greatly reduced in winter when most individuals hibernate, emerging on warm days to forage (Harris, 1988). Western pipistrelle does not migrate or hibernate but is much less active in winter months (Harris, 1986). Mexican free-tailed bat in California makes local movements to and from hibernacula or short migrations between altitudes in the winter (Harris, 1998).

FIGURE DR56-3.
Comparison of Indices of Activity (IAs) from Disparate Habitats



TABLE DR56-2
Comparison of Bat Activity Indices from other Areas

Study Area	Dates of Study	Bat Activity ²	Total Detector Nights	Source
Mountaineer, WV	8/31 to 9/11/2004	820	33	E. B. Arnett, Bat Conservation International, unpublished data
Buffalo Mountain, TN	9/1/2000 to 9/30/2003	2370	149	Fiedler 2004
Top of Iowa, IA	3/15 to 12/15/2003, 2004	3490	42	Jain 2005
Buffalo Ridge, MN	3/15 to 11/15/2001, 2002	210	216	Johnson et al. 2004
Foot Creek Rim, WY	11/1/1998 to 12/31/2000	220	39	Gruver 2002
Hidden Hills SEGS, CA	12/25/2011 to 3/31/2012	123	98	

¹ Based on Table 5 in Kunz et al. 2007.

² (no./detector/night)*100

Conclusion

The total level of bat activity in this reporting period is very low but includes a part of the winter period of low activity. Bat activity for one bat species designated as a California Species of Concern, the pallid bat, was recorded on one night out of the total 98 data collection nights in the reporting period. Because there was only one recorded instance of bat activity for the pallid bat, it appears that pallid bat does not roost onsite or along the southern portion of the project, and there is a very low likelihood that pallid bat forages onsite. The low level of pallid bat activity recorded may reflect a transit of the site rather than foraging over the site, which would be more prolonged.

Furthermore, the potential for impacts to bat species foraging at night over the site is low. The potential for bat strikes against facility structures is extremely low because bats have echolocation abilities that enable them to precisely locate and capture insects in flight. They easily locate and avoid large stationary structures. Unlike wind projects, there are no moving objects associated with the facility that could defeat the echolocation abilities of bats resulting in injury. In addition, given their habit of nocturnal activity, there is no potential for heat impacts to bats, given the strictly daytime concentration of solar flux by the heliostat field. These conclusions are supported by the lack of bat mortality reports at solar power tower facilities. Consequently, the low levels of bat activity recorded at the site to date support the conclusion that the project has extremely low potential for significant impacts to bats.

References

- Fiedler, J. K. 2004. Assessment of bat mortality and activity at Buffalo Mountain Wind Farm, Eastern Tennessee. Thesis, University of Tennessee, Knoxville, USA. (Cited in Kunz 2007)
- Gruver, J. C. 2002. Assessment of bat community structure and roosting habitat preferences for the hoary bat (*Lasiurus cinereus*) near Foote Creek Rim, Wyoming. Thesis, University of Wyoming, Laramie, USA. (Cited in Kunz 2007)
- Harris, J. 1988. In: Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Department of Fish and Game, Sacramento, California.
- Jain, A. 2005. Bird and bat behavior and mortality at a northern Iowa windfarm. Thesis, Iowa State University, Ames, USA. (Cited in Kunz 2007)
- Johnson, G. D., M. K. Perlik, W. P. Erickson, and M. D. Strickland. 2004. Bat activity, composition, and collision mortality at a large wind plant in Minnesota. *Wildlife Society Bulletin* 32:1278–1288. (Cited in Kunz 2007)
- Kunz, Thomas H., Edward B. Arnett, Brian M. Cooper, Wallace P. Erickson, Ronald P. Larkin, Todd Mabee, Michael L. Morrison, M. Dale Strickland and Joseph M. Szewczak. 2007. Assessing Impacts of Wind-Energy Development on Nocturnally Active Birds and Bats: A Guidance Document. *Journal of Wildlife Management* 71(8):2449–2486.
- Limpens, H.J.G.A., and G.F. McCracken. 2004. Choosing a bat detector: Theoretical and practical aspects. Pp. 28-37 in *Bat Echolocation Research: Tools, Techniques, and Analysis*, R.M. Brigham, E.K.V. Kalko, G. Jones, S. Parsons, and H.J.G.A. Limpens, eds. Austin, TX: Bat Conservation International.
- Thomas H. Kunz, Edward B. Arnett, Brian M. Cooper, Wallace P. Erickson, Ronald P. Larkin, Todd Mabee, Michael L. Morrison, M. Dale Strickland and Joseph M. Szewczak. 2007. Assessing Impacts of Wind-Energy Development on Nocturnally Active Birds and Bats: A Guidance Document. *Journal of Wildlife Management* 71(8):2449–2486.
- Titley Scientific. 2011. Frequently Asked Questions. Available on-line at: <http://www.titley-scientific.com/us/index.php/faqs#faq-2> Accessed April 5, 2012.



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**APPLICATION FOR CERTIFICATION
FOR THE *HIDDEN HILLS SOLAR ELECTRIC
GENERATING SYSTEM***

DOCKET NO. 11-AFC-2
PROOF OF SERVICE
(Revised 3/22/2012)

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DECLARATION OF SERVICE

I, Mary Finn, declare that on April 20, 2012, I served and filed copies of the attached Hidden Hills SEGS Data Response, Set 1B-6, dated April 20, 2012. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: www.energy.ca.gov/sitingcases/hiddenhills/index.html.

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(Check all that Apply)

For service to all other parties:

- Served electronically to all e-mail addresses on the Proof of Service list;
- Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses **NOT** marked "e-mail preferred."

AND

For filing with the Docket Unit at the Energy Commission:

- by sending an electronic copy to the e-mail address below (preferred method); **OR**
- by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 11-AFC-2
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

- Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
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Sacramento, CA 95814
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I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.



Mary Finn
CH2M Hill