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Subject: Data Response, Set 1B-6, Quarter 2
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, Quarter 2.

This data response set is being filed electronically. Please call me if you have any questions.

Sincerely,

CH2M HILL

A handwritten signature in blue ink, reading "John L. Carrier".

John L. Carrier, J.D.
Program Manager

Encl.

c: POS List
Project file

California Energy Commission

DOCKETED
11-AFC-2

TN # 66476

AUG 03 2012

Data Response Set 1B-6, Quarter 2

Hidden Hills

Solar Electric Generating System

(11-AFC-2)



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

August 2012

With Technical Assistance from



Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

**Data Response, Set 1B-6, Quarter 2
(Response to Data Request 56)**

Submitted to the
California Energy Commission

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

August 3, 2012

With Assistance from
CH2MHILL
2485 Natomas Park Drive
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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 Request 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. This report summarizes the second quarter of AnaBat™ monitoring results.

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."

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 the 2012 First Quarter AnaBat™ monitoring results submitted April 17, 2012. It adds results for the period of April 1, 2012 to June 22, 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

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).

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) (Titley 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 detectors (D) and the number of nights of data collection (N) multiplied by 100 ($IA = M/D/N \times 100$). 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 second quarter reporting period (83 data collection nights), a total of 3,612 files were collected, of which 286 files were identified as containing bat activity. These 286 files represent a total of 279 minutes of recorded bat activity for the reporting period (Table DR56-1).

During the entire sampling effort to date (181 data collection nights), a total of 8,591 files were collected, of which 334 files were identified as containing bat activity. These 334 files represent a total of 325 minutes of recorded bat activity for the reporting period (Table DR56-1).

The calls were analyzed by mammalogist, Dr. Michael O'Farrell, who identified eight species of bat. Data for the entire sampling effort are summarized in Table DR56-1.

TABLE DR56-1.

AnaBat™ Acoustic Data in Minutes of Activity Recorded between December 21, 2011 and June 22, 2012 and Calculated Indices of Activity (IA).

Nights of Survey		Dec	Jan	Feb	Mar	Apr	May	Jun	Total
		7	31	29	31	30	31	22	181
Minutes of Activity Recorded									
Scientific Name	Common Name	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Pallid Bat ^{1,2}	<i>Antrozous pallidus</i>	0	0	0	1	1	0	0	2
Big Brown Bat	<i>Eptesicus fuscus</i>	0	0	3	1	0	0	2	6
Hoary Bat	<i>Lasiurus cinereus</i>	0	0	0	0	7	2	0	9
California Myotis	<i>Myotis californicus</i>	0	0	1	9	4	16	28	58
Western Small-footed Myotis ²	<i>Myotis ciliolabrum</i>	0	0	0	0	1	4	0	5

TABLE DR56-1.

AnaBat™ Acoustic Data in Minutes of Activity Recorded between December 21, 2011 and June 22, 2012 and Calculated Indices of Activity (IA).

Yuma Myotis ²	<i>Myotis yumanensis</i>	0	0	0	0	4	19	13	36
Western Pipistrelle	<i>Parastrellus hesperus</i>	0	0	1	8	38	44	77	168
Mexican Free-tailed Bat ¹	<i>Tadarida brasiliensis</i>	0	0	3	19	8	6	5	41
Indices of Activity (IA)³		Dec	Jan	Feb	Mar	Apr	May	Jun	All⁵
Pallid Bat ^{1,2}	<i>Antrozous pallidus</i>	0	0	0	3	3	0	0	1
Big Brown Bat	<i>Eptesicus fuscus</i>	0	0	10	3	0	0	9	3
Hoary Bat	<i>Lasiurus cinereus</i>	0	0	0	0	23	6	0	5
California Myotis	<i>Myotis californicus</i>	0	0	3	29	13	52	127	32
Western Small-footed Myotis ²	<i>Myotis ciliolabrum</i>	0	0	0	0	3	13	0	3
Yuma Myotis ²	<i>Myotis yumanensis</i>	0	0	0	0	13	61	59	20
Western Pipistrelle	<i>Parastrellus hesperus</i>	0	0	3	26	127	142	350	93
Mexican Free-tailed Bat	<i>Tadarida brasiliensis</i>	0	0	10	61	27	19	23	23
All Species Combined ⁴		0	0	28	123	210	294	568	180

¹ CSC = California Department of Fish and Game "Species of Special Concern." This is an administrative designation and carries no formal legal status.

² BLM SS = BLM Sensitive Species

³ 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.

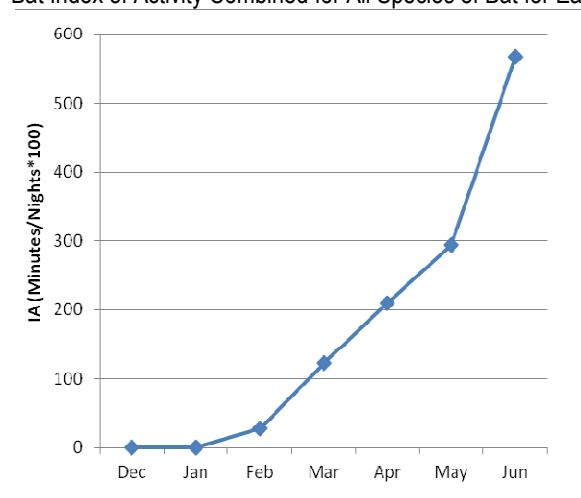
⁴ The combined IA is calculated directly from data and is not the sum of species-specific indices. Example from All Species Combined for All Nights: 325 minutes/181 recording nights x 100 = 179.558, rounded to 180.

⁵ The IAs in this column are cumulative for the entire sampling period, December through June. Pallid bat, for example is calculated (1+1)/1recorder/181 nights*100 = (0.1111*100) ≈ 1 (rounded).

The monthly combined (i.e., cumulative) bat IA increased from 0 in December and January to 568 in June (Figure DR56-1). The IA for all species combined for the duration of the monitoring effort to date is 180.

FIGURE DR56-1.

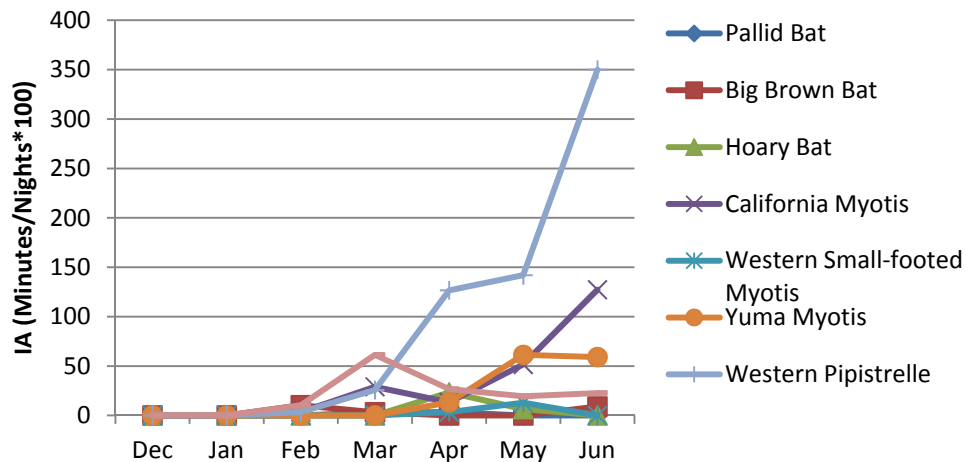
Bat Index of Activity Combined for All Species of Bat for Each Month



As bat activity increased approaching the spring season, the IA of each species diverged from the others. The most frequently recorded species in the first quarter was the Mexican free-tailed bat (*Tadarida brasiliensis*) and the least frequently recorded species was the pallid bat (*Antrozous pallidus*) (see Table DR56-1).

All species recorded in the first quarter were also recorded in the second quarter. However, three species were detected in the second quarter, which were not recorded in the first quarter. They were hoary bat (*Lasiurus cinereus*), western small-footed myotis (*Myotis ciliolabrum*) and Yuma myotis (*Myotis yumanensis*). The IA of some species peaked over the two quarters, and decreased toward the end of the second quarter. They were pallid bat, big brown bat (*Eptesicus fuscus*), hoary bat, Mexican free-tailed bat and western small-footed myotis. Species that had an increasing trend through the second quarter were California myotis (*Myotis californicus*), Yuma myotis and western pipistrelle (*Parastrellus hesperus*). Over the two quarters, the least recorded species was pallid bat and the most recorded species was western pipistrelle (see Table DR56-1).

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).

The increased IA values beginning in February probably reflect a seasonal increasing trend in activity level as bats leave hibernacula. The species recorded in the first quarter 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). 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, 1988). Mexican free-tailed bat in California makes local movements to and from hibernacula or short migrations between altitudes in the winter (Harris, 1988).

Bat species recorded for the first time in the second quarter (hoary bat, western small-footed myotis and Yuma myotis) migrate after hibernation. Hoary bat migrates seasonally (Cryan, 2003; Shump and Shump, 1982), which explains the peak in recordings. Western small-footed myotis is active well into autumn and emerges as early as March (Jones et al., 1983). It is thought that Yuma myotis hibernates and makes short migrations to hibernacula, many migrating to higher elevations for the summer. The Yuma myotis may be found feeding and roosting with other bat species, such as Mexican free-tailed bat and pallid bat (Harris, 1988).

TABLE DR56-2.
Comparison of Bat Activity Indices from other Areas¹

Study Area	Dates of Study	Bat Activity ²	Total Detector Nights	Source
Hidden Hills SEGS, CA	12/21/2011 to 6/22/2012	180	181	
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	May, Aug and Sept 2004	3490	42	Jain, 2005
Buffalo Ridge, MN	6/15 to 9/15/2001 & 2002	210	216	Johnson et al., 2004
Foot Creek Rim, WY	Jun to Aug, 2000 & 2001	220	39	Gruver, 2002

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

² (minutes of activity/detectors/nights of recording)*100

Conclusion

All recorded bat activity is very low in comparison to other areas. Activity in the second quarter increased as the weather warmed and bats emerged from hibernation and migrations began. The level of activity for all species in the first quarter was very low. It included part of the winter period of low activity and the late hibernation period. Bat activity included two bat species designated as California Species of Concern, the pallid bat and the Mexican free-tailed bat. Three additional species were identified in the second quarter. They were hoary bat, western small-footed myotis and Yuma myotis. The two Myotis species are designated BLM sensitive species.

Pallid bat was recorded on one night out of the total 98 data collection nights in the first quarter. In the second quarter, pallid bat activity was recorded in three one-minute files in

April but no activity was recorded in May or June. Because there were few recorded instances of bat activity for the pallid bat, it appears that it does not roost onsite or along the southern portion of the project, and there is a very low likelihood that pallid bat forages onsite. Males are excluded from nursery colonies. Females give birth in late May or June (AGFD, 2002). No recordings of activity were made during this period. The low level of pallid bat activity recorded may reflect a few transits of the site rather than foraging over the site, which would show more activity.

Mexican free-tailed bat activity was first recorded in February and peaked in April, then declined to approximately one third of the peak level and continued through the second quarter. This pattern agrees with expected behavior patterns of the species. In California, Mexican free-tailed bat makes local movements to and from hibernacula or short migrations altitudinally. Bats on the east side of the Sierra Nevada migrate north in spring and south in fall (Harris, 2005). This is a highly vagile mammal that is characterized by extremely large population sizes (Russell and McCracken, 2006). Males and females have different seasonal patterns of movement. Migratory females typically move long distances to maternity colonies while many males appear to engage in local movements in the vicinity of their winter roosts (Davis et al., 1962; Villa and Cockrum, 1962). The pattern of activity recorded is consistent with emergence from hibernation and migration through the area then declining to a small population.

Yuma myotis was first recorded at very low levels in April and at slightly increased levels in May and at a lower level in June. It is known to hibernate but winter habits are poorly known. This species is common and widespread in California and presumed to be a resident species. In the Mojave Desert and Colorado Desert regions it is uncommon except in the mountain ranges bordering the Colorado River Valley. Optimal habitats are open forests and woodlands with sources of water over which to feed, many migrating to higher elevations for the summer (Harris, 1988). The activity level recorded in April and May is consistent with emergence from hibernation and a small population.

Western small-footed myotis activity was recorded once in April and only four times in May. It fell to zero events in June. In California, this species is most common in desert scrub and pinyon-juniper forest (Szewczak et al., 1998). This species emerges from hibernation as early as March and is active into autumn (Jones et al., 1983). It prefers open stands in forests and woodlands or brushy habitats. It drinks and feeds near fresh water sources like springs, streams and ponds or stock tanks. The activity level recorded in April and May is consistent with emergence from hibernation and migration of a few individuals through the site to more favorable habitats.

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.

The only special status bat species detected at the project site are pallid bat, western small-footed myotis and Yuma myotis (see Table DR56-1)². Pallid bat activity was very low, reflecting a few transits of the site rather than foraging activity, which would have resulted in a larger number of Pallid bat detections. Western small-footed myotis activity was also very low, and was consistent with the emergence from hibernation and migration of a few individuals through the site to more favorable habitats, rather than use of the site for forage. Therefore, because neither species utilizes the project site for forage, the potential for impacts to these species is very low.

Yuma myotis activity was also detected at low levels. In May and June, it averaged approximately 1 minute every 2 nights, which is not consistent with active foraging over the site. This species is uncommon in this region except in the mountain ranges bordering the Colorado River Valley. It prefers open forests and woodlands with sources of water over which to feed. Many migrate to higher elevations for the summer. The low level of recorded Yuma myotis activity is consistent with a few transits by migrants, rather than usage of the area for either roosting or foraging. The potential for impacts to this species are very low and less than significant.

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² Data Request 56 appears to suggest that Townsend's big-eared bat was detected during the surveys or was otherwise recorded in the survey area. This species has not been detected during any of the AnaBat™ or other surveys within the site.

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**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
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**APPLICATION FOR CERTIFICATION
FOR THE *HIDDEN HILLS SOLAR ELECTRIC
GENERATING SYSTEM***

DOCKET NO. 11-AFC-02

PROOF OF SERVICE
(Revised 6/18/2012)

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DECLARATION OF SERVICE

I, Mary Finn, declare that on August 3, 2012, I served and filed copies of the attached Data Response, Set 1B-6, dated August 3, 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-02
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.ca.gov

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
1516 Ninth Street MS-14
Sacramento, CA 95814
michael.levy@energy.ca.gov

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