

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET
SACRAMENTO, CA 95814-5512

March 9, 2012

Clay Jensen, Senior Director
BrightSource Energy, Inc.
1999 Harrison Street, Ste. 2150
Oakland, CA 94612

DOCKET	
11-AFC-2	
DATE	MAR 09 2012
RECD.	MAR 09 2012

RE: HIDDEN HILLS SOLAR ELECTRIC GENERATING SYSTEM (11-AFC-2), DATA REQUESTS, SET 2D (#'s 156-176)

Mr. Jensen:

Pursuant to Title 20, California Code of Regulations, Section 1716, the California Energy Commission staff seeks the information specified in the enclosed data requests. The information requested is necessary to: 1) more fully understand the project, 2) assess whether the facility will be constructed and operated in compliance with applicable regulations, and 3) assess whether the project will result in significant environmental impacts.

This set of data requests (Set 2D, #'s 156-176) is being made in the area of Biological Resources. Written responses to the enclosed data requests are due to the Energy Commission staff on or before April 9, 2012.

If you are unable to provide the information requested, need additional time, or object to providing the requested information, you must send a written notice to both the Committee and me within 20 days of receipt of this notice. The notification must contain the reasons for not providing the information, the need for additional time, and the grounds for any objections (see Title 20, California Code of Regulations, Sec.1716 (f)). If you have any questions, please call me at (916) 654-4894 or email me at mike.monasmith@energy.state.ca.us.

Sincerely,

Mike Monasmith
Project Manager

cc: Docket (11-AFC-2)
Proof of Service List

PROOF OF SERVICE (REVISED 2/1/12) FILED WITH
ORIGINAL MAILED FROM SACRAMENTO ON 3/9/12
EKS

Technical Area: Biological Resources

Authors: Edward Brady, Carol Watson

BACKGROUND -- Effects of Solar Power Tower Technology on Avian Species

Various factors will affect solar flux across the project site, including the height of the heliostats. AFC Section 2.2 states that heliostats are approximately 12 feet high, and would be mounted on a pylon. No reference is made to the height of the pylon, the depth to which pylons will be buried, or the expected ground clearance of installed heliostats. The AFC further explains that certain areas of the solar fields would be more efficient than others due to incidence and reflection angles. Staff needs additional information to evaluate reflectance across the solar fields, and how this could potentially impact avian species as they fly across the project site.

DATA REQUESTS

156. Please provide a description of the height and mounting techniques proposed to be used for installing heliostats.
157. Provide a description of the final “as-built” clearance of the heliostats to the ground. The discussion should include proposed measures for placement of heliostats in washes or other areas where soil characteristics would dictate special installation practices that might affect the final height of the installed heliostat.

BACKGROUND

AFC section 2.2.1.2 states that a computer-programmed aiming control system will individually direct each heliostat to proper orientation relative to the sun. Staff understands that during the course of a typical day’s operations, the heliostats are maintained in one of three primary positions: sleep position, during which the plant is not operating and heliostats are in a position that affords safety from the elements; stand-by position, in which one or more heliostats are oriented to reflect on a single point some unknown distance into the sky; and operational, during which heliostats are actively tracking the sun and focusing solar reflection on the solar receiver steam generator (SRSG). Heliostat position is known to be influential in bird flight paths, occasionally appearing as a body of water, and inviting mass landings of migrating birds. In evaluating potential effects of solar reflectance on avian species, staff requests the following information on the operating profile of the proposed project.

DATA REQUESTS

158. Please provide a discussion of the operating profile on a seasonal and daily basis. Information provided should detail:
 - a. the amount of time spent in each of the three operating positions for both daily and seasonal operation;

- b. a description of the location of heliostats expected to be in each position (for example in the eastern region of solar field 1), represented by sample maps (for both daily and seasonal operations); and,
 - c. the number of heliostats projected to be in each position (both daily and seasonal operation).
- 159. Please describe the height of focused reflectance by heliostats during stand-by position and factors used in determining the position of the stand-by positions.
- 160. Describe the operating parameters in altering the number, location, or duration of heliostats in stand-by position relative to the likely seasonality of use of stand-by position. Staff believes that reduced solar insolation during winter and spring may coincide with avian migration, and understands that the stand-by position is utilized more often during periods of diminished solar insolation. Please describe the feasibility of implementing an adaptive management approach to minimize potential adverse affects to birds from solar energy, and the measures that might be employed as part of an adaptive management program.
- 161. Please provide four diagrams in profile view of reflected solar flux, each should be modeled at 100% of project output. The diagrams must depict clearly, in kw/m^2 , solar flux from power tower to heliostats. Please provide a diagram for reflected solar flux from heliostats at the following four locations: closest to power tower 1, furthest from power tower 1 (approximately 7,700 feet), closest to power tower 2, and furthest from power tower 2 (approximately 6,500 feet). Please also clearly indicate linear distance encompassed by each zone of flux, in meters.
- 162. The plan view of the flux map prepared for the proposed Rio Mesa Solar Project (BrightSource Energy presentation at January 6 2012 staff workshop, tn 63357, page 26), specifies a flux pattern at a certain wind condition, e.g., 7 m/sec (15 mph). Shape indicates that wind effect acts to compress the area of influence. Conversely, still air conditions would extend the area of influence. Please confirm that the plan and elevation views represent the same wind conditions and provide the respective profiles for still air. Please indicate if these profiles represent conditions consistent with Applicant's attachments DR57-2, DR57-3 and DR-4 (provided as part of applicant's response to Data Request #57) discussed below.

163. Please discuss the possibility of preventing bird collisions with heliostats by randomizing the angle of heliostats during sleep position. Discuss any glint/glare effects this operational approach might have on other sensitive human or wildlife receptors, and whether (and how) identified impacts could be mitigated or minimized, and in what fashion.

BACKGROUND

Data Request Set 1B requested data on ambient temperatures at the solar tower, as projected by modeling. Applicant's response to Data Request #57 included Attachment DR57-4, "Expected Temperature Drop of the SRSG Panels After Shutdown (at 30°C ambient)". Staff requests clarification of Attachment DR57-4 as follows.

DATA REQUESTS

164. Please provide the name of the model used to generate data outlined in Data Response #57 (part of Applicant's Data Responses, Set 1B, tn 63056, filed on 12/5/2011).
165. Please confirm the accuracy of the data presented in Attachment DR57-4. Please also provide a description of assumptions used in creating this data, and explain the X axis variables, "Eva panels" and "SH panels". The steam cycle in AFC Figure No: 2-4-1 specifies a requirement for generating steam to a superheat of 585°C (1,085°F) and Figure DR57-4 shows a surface temperature of 425°C (887°F) at the SH panels and 325°C (617°F) at the Eva panels.

Recognizing that the saturated steam temperature at 100 bar (1,460 psia) is 311°C (592°F), please demonstrate how heat transfer up to the superheated condition is attained. Please consider performing a heat balance on the solar cycle similar to the conventional steam cycle heat balance. Include absorbance, transmittance and reflectance factors for the heliostats and tower receiver, effective collector and receiver areas, and design basis solar insolation and intensities that deliver 270 MW to the steam generator.

166. Please provide a description of the projected percentage power output of the plant on a seasonal basis.

BACKGROUND

Section 5.2.7.6.3 of the AFC discusses potential project impacts to migratory and resident birds. The discussion outlines impacts from project construction and project demolition, and states that collisions with vehicles and equipment, noise impacts, and loss of habitat are potential impacts of construction of the project. However, the

discussion does not include potential operational impacts of solar reflectance on avian species. Staff has concerns regarding potential injury or even death of birds resulting from singeing, burning, or eye damage from moving through solar reflectance. Staff is currently unable to analyze potential impacts of solar flux on avian species due to lack of data. Staff needs to understand the tolerance of solar flux by avian species, potential avian tolerance thresholds of species expected to be at the site, and determine whether operation of the project will adversely impact avian species. If impacts are identified, staff will then need to analyze mitigation and conservation measures appropriate to the impact and applicable laws, ordinances, regulations, and standards (LORS).

DATA REQUESTS

167. Please identify the solar flux tolerance thresholds where birds may be injured or singed in any capacity (vision, skin, plumage damage, or other impact).
168. Provide a discussion of predicted fatality rates for each species or species group over the life of the project, based on determined tolerance thresholds. Provide predicted fatality rates for each special status species potentially occurring in the area, as well as for passerines and raptors. Describe how flight speed, surface area-to-volume ratio, and plumage color would affect avian species known to occur and/or migrate over the site, as well as any other variables that could affect fatality rates. Please also describe the predicted rates of non-fatal injuries for each special status species potentially occurring in the area, as well as for passerines and raptors.
169. Provide a discussion of how seasonal variation and weather conditions might affect fatality rates. Discuss how seasonal variations and weather conditions could affect these non-fatal injury rates.
170. Provide a discussion of fatality rates compared between breeding and non-breeding seasons, and discuss the degree of accuracy in the predicted fatality rates. Please also provide a discussion of how non-fatal injury rates would be expected to compare between breeding and non-breeding seasons, and discuss the degree of accuracy in the predicted non-fatal injury rates.
171. Please describe the project's conformance with the Federal Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Fish and Game Code (Sections 355 – 356, 3513, 3511, 4700, 5050, and 5515) relative to the project's projected non-fatal and fatal injury rates. Please describe measures that applicant would implement to insure impacts are mitigated to less than significant and the project complies with LORS.

Technical Area: Biological Resources

Author: Carolyn Chainey-Davis

BACKGROUND – Ephemeral Wash Habitat

The Jurisdictional Delineation Report (Application for Certification [AFC] (tn: 61756), Volume 2, Appendix 5-2E) erroneously reported mesquite thickets occurring within the proposed project boundary. In Supplemental Data Responses, Set 1A, DR# BR-2 (tn: 63259), the applicant confirmed that no mesquite thickets occur onsite, and staff concurs, based on an aerial photo review. However, staff is still unclear what kind of habitat occurs on the washes, and in what way it is distinct from the surrounding upland; no description of the wash vegetation was provided in the Jurisdictional Delineation Report. Aerial photos of the project site indicate that the vegetation on the washes is distinct. Staff lacks the information needed to determine whether the project would impact desert wash scrub, a sensitive natural community and potential jurisdictional Waters of the State.

DATA REQUEST

172. Please submit a detailed description of the vegetation that occurs along the ephemeral washes, and is distinct – at least in aerial photo signature – from the surrounding upland, including wash features that were not delineated. The description should include a list of dominant species in each layer. If the habitat does not differ in species composition, please indicate if it has a higher density or percent cover, or in some other way is distinct structurally. If the field notes are insufficient to fulfill this request, please collect this information during the spring 2012 botanical surveys and provide the description and at least one photo of the representative habitat (per habitat type, if there is more than one) in a separate report.

BACKGROUND – Offsite Special-Status Plants

The vegetation map of the one-mile buffer surrounding the proposed project site (tn 61756: AFC Volume 1, Section 5.2, Figure 5.2-3) indicates the presence of mesquite thickets associated with the springs east of the project boundary, as well as Mojave desert scrub, shadscale scrub, and a small area of disturbed (unvegetated) habitat. Area figures were provided for the vegetation and other cover types that occur within the project boundary, but not outside the project within the one-mile buffer. Staff needs this information to adequately assess the project's potential indirect impacts to adjacent habitat.

DATA REQUEST

173. Please provide acreages for the four cover types that occur within the one-mile buffer depicted in Figure 5.2-3 of the AFC, Section 5.2 (Biological Resources).

BACKGROUND – Off-site Surveys

During the public workshop on February 22, 2012, the applicant volunteered to conduct additional off-site surveys for the 10 special-status plant species found on the project site during the spring 2011 botanical surveys within the proposed project site (tn 63262: Data Response Set 1B-2, Attachment Data Request #63-1A, filed 12/30/2011).

Additional off-site occurrences, if found, could improve staff's understanding of the broader range of these rare species in California, and allow staff to understand where additional occurrences are located which could possibly lessen the likelihood of significant impacts for some of the rarest species. Additional information on the size and integrity of the off-site occurrences, ownership, and management opportunities would allow staff to consider a full range of mitigation options. Given the timing of these additional field surveys, the results of these additional surveys will not necessarily be available for the Preliminary Staff Assessment, however, they will be fully considered in staff's Final Staff Assessment.

DATA REQUEST

174. Please submit a brief status report or memo on the spring 2012 surveys for the following 10 special status plant species: pink funnel-lily (*Androstephium breviflorum*), gravel milk-vetch (*Astragalus sabulonum*), Preuss' milk-vetch (*Astragalus preussii* var. *preussii*), Tidestrom's milk-vetch (*Astragalus tidestromii*), Wheeler's skeletonweed (*Chaetadelpa wheeleri*), purplenerve spring parsley (*Cymopterus multinervatus*), Pahump Valley buckwheat (*Eriogonum bifurcatum*), Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*), desert wing-fruit (*Selinocarpus nevadensis*), and Nye milk-vetch (*Astragalus nyensis*). The status report shall include a table of all new occurrences, copies of completed California Natural Diversity Database (CNDDDB) field forms for each special-status plant occurrence, and the new GPS data (and metadata). The status report shall be submitted no later than May 15th, 2012. A final spring 2012 Botanical Survey Report shall be submitted no later than June 15th, 2012. The final report shall include a brief discussion of the survey methods, maps of all occurrences at a scale identical to that used in the spring 2011 Botanical Resource Survey (1" = 2,400 feet), a table of new occurrences that includes information on the occurrence size and site quality, ownership, and management or restoration opportunities. Please include all GPS data (and metadata). If any new species are found, please provide species accounts and status codes.

BACKGROUND – Special Status Plants

During staff's review of the spring 2011 Offsite Surveys for Special-Status Plants (tn: 63486: AFC Supplement B; Data Response Set 1B-3, Attachment DR63-2, and Appendix Table C-1 of that Attachment, dated 1/31/2012: Plant Species Observed

within the HHSEGS 1-mile Buffer in 2010 and 2011), staff noticed that the rare Torrey's joint-fir (*Ephedra torreyana*), a California Native Plant Society (CNPS) List 2.1 species, was observed within the one-mile buffer, as well as other common joint-fir species. Staff understands that this taxon was only recently added to the Online CNPS Inventory of Rare and Endangered Plants [8th ed.] on February 8, 2012 (CNPS 2012)¹. Staff understands that because this rare species was not listed at the time of special-status plant surveys, field crew members would not have been directed to examine all joint-fir encountered to determine if the rare Torrey's joint-fir was present, and would have been over-looked. Staff must assess impacts to all special-status plant species potentially occurring on-site, as well as the potential for indirect effects to species occurring adjacent to the project site.

In the on-site survey report list of plants observed, staff noted three additional species that require further investigation or clarification: spiny menodora (*Menodora spinescens*); an unconfirmed blazing star (*Mentzelia* "cf." *albicaulis*); and an unidentified aliciella (*Aliciella* sp.), informally named "Marta Beckett's tutu". Because there are two rare *Aliciella* species and several rare *Mentzelia* species known from the project vicinity, staff is concerned that additional rare species may have been overlooked. In the case of the menodora, a new rare variety (*Menodora spinescens* var. *mohavensis*) was recently found in California and recently added to the Inventory of Rare and Endangered Species as a CNPS List 1B.2 species (CNPS 2012).

DATA REQUESTS

175. Please provide the results of off-site and on-site spring 2012 special-status plant surveys for Torrey's joint-fir, as described above (in Data Response Set 1B-3, Attachment DR63-2), and include the results of the Torrey's joint-fir surveys in the spring 2012 Botanical Survey Report.
176. Please also provide clarification on the identification of the previously unidentified *Mentzelia* and *Aliciella* and the variety of *Menodora* observed on-site. If identification cannot be confirmed, please revisit these occurrences in the field to identify the plants to species or to a level necessary to detect rare species, if present. If any of these previously unidentified plants are determined to be a rare California species, then please provide field survey information and maps for these additional species in the requested spring 2012 Botanical Survey Report.

¹ California Native Plant Society (CNPS). 2012. *Inventory of Rare and Endangered Plants* (online edition, v8). California Native Plant Society. Sacramento, CA. Accessed on February 28, 2012 from <http://www.cnps.org/inventory>



**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV**

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

**DOCKET NO. 11-AFC-2
PROOF OF SERVICE
(Revised 2/1/2012)**

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DECLARATION OF SERVICE

I, Elizabeth Stewart, declare that on March 9, 2012, I served and filed copies of the attached Data Request #2D for the Hidden Hills Solar Electric Generating System (11-AFC-2) dated March 9, 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:

- X Served electronically to all e-mail addresses on the Proof of Service list;
- X 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:

- X 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
1516 Ninth Street MS-14
Sacramento, CA 95814
mlevy@energy.state.ca.us

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.

Originally signed by
Elizabeth Stewart