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STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of: **Application for Certification for the** **PALEN SOLAR ELECTRIC GENERATING SYSTEM**	**Docket No. 09-AFC-07C**

ENERGY COMMISSION STAFF OPENING BRIEF

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ENERGY COMMISSION STAFF OPENING BRIEF

I. INTRODUCTION

Palen Solar Holdings, LLC (PSH) has filed a Petition For Amendment of the Palen Solar Power Project (PSPP) which was approved by the Energy Commission on December 15, 2010 (Order No. 10-1215-19, the "Final Decision", 09-AFC-7). The Petition proposes to eliminate the use of solar parabolic trough technology and replace it with BrightSource's LPT solar power tower technology. The proposed amended project is referred to as the Palen Solar Electric Generating System (PSEGS).

The PSEGS project will require various modifications to the approved project. The most significant changes relevant to issues discussed in this Opening Brief include:

- the addition of 170,000 heliostats – elevated mirrors guided by a tracking system mounted on a pylon – which will be vibrated into the ground to a depth of approximately 8 to 12 feet;
- the addition of two 750 foot-tall power towers, each topped with a solar receiver steam generator (SRSG) which will glow brightly during the day when the heliostat mirrors are focusing reflected sunlight onto the SRSG;
- a revised project footprint. While the Energy Commission approved two alternative configurations of the PSPP, the proposed PSEGS project uses both of these alternative configurations to form a new footprint. (see Exh. 2000, Biological Resources – Figure 1, Palen Solar Electric Generating System – Boundary of Approved and Modified Projects.);
- elimination of the use of millions of gallons of Therminol, the Heat Transfer Fluid (HTF) utilized by the parabolic technology;
- a reduction in groundwater use, both during construction and operations; and
- a reduction in grading from a total of 4.5 million cubic yards of cut and fill to 0.2 million cubic yards of cut and fill.

Staff completed a thorough review and analysis of the PSEGS project. In order to ensure a thorough analysis, staff for each subject matter area reviewed the PSPP Revised Staff Assessment together with the conditions of certification contained in the Final Decision. Staff determined where the PSEGS project resulted in changes that would require new or further analysis and then completed a thorough analysis of those changes. Based on that analysis, Staff proposed new conditions of certification or changes to existing conditions of certifications where warranted.

Staff published a Preliminary Staff Assessment (PSA) on June 28, 2013 and published the Final Staff Assessment (FSA) in three parts: Part A on September 10, 2013, which included an analysis of all subject matter areas except Cultural Resources and Air Quality (Exh. 2000); Part B on September 23, 2013, which included the Cultural Resources analysis (Exh. 2001); and Part C on November 1, 2013, which included the

Air Quality analysis (Exh. 2013). Staff's analysis of the PSEGS project indicates that it would result in significant environmental impacts that cannot be mitigated for Visual Resources and Cultural Resources, like PSPP. Unlike PSPP, Staff has also determined that the PSEGS project would very likely result in significant and unmitigable impacts to Biological Resources, mainly due to the solar power tower technology's introduction of solar flux danger to avian species. The PSEGS project would satisfy all applicable laws, ordinances, regulations, and standards (LORS).

II. UNRESOLVED ISSUES BETWEEN STAFF AND PSH

Staff and PSH have been diligent in their efforts to address many issues during the seven public workshops, through written testimony, and at hearings. The limited issues that remain unresolved between Staff and PSH are discussed in detail under the applicable subject area heading.

1. CULTURAL RESOURCES

Staff has determined that the construction and operation of the PSEGS project would result in significant direct visual impacts to the Chuckwalla Valley portions of the Pacific to Rio Grande Trails Landscape (PRGTL) and the Ironwood Historic Mining District. (Exh. 2001, pp. 4.3-158 to 159.) Staff concluded that the direct visual effects of the PSEGS project on the PRGTL would be significant and unmitigable, and, further, that the cumulative visual effects to the landscape would be cumulatively considerable and unmitigable. (*Id.* at p. 4.3-166.) Staff also concluded that the PSEGS project's direct visual effects on the Ironwood Mining District would be significant, though mitigable. (*Id.* at p. 4.3-102.)

The cultural resources analysis of the originally licensed PSPP focused on cultural resources on the project site. The effects of a solar thermal power project on the onsite cultural resources were already adjudicated during that case. Staff reviewed the Final Decision and the prior staff analysis of the PSPP project, analyzed the proposed amended project, and determined that the proposed PSEGS project would not result in new impacts that would require revising the Final Decision regarding impacts to cultural resources on the project site. (*Id.* at p. 4.3-1.)

The focus of the cultural resources analysis for the PSEGS project was the effects that the construction and operation of the project would have on cultural resources outside of the project's footprint, within a 15-mile Project Area of Assessment (PAA). Staff determined that the 15-mile PAA was reasonable because this would constitute the geographic area across which the project may have the potential to cast significant visual effects on cultural resources. (Exh. 2001, pp. 4.3-42 to 43.)

a. Condition of Certification CUL-1. Treatment of the Chuckwalla Valley Portion of the Pacific to Rio Grande Trails Landscape (PRGTL)

The primary, though not exclusive, focus of Staff's cultural resources analysis for the PSEGS is the Chuckwalla Valley portion of the Pacific to Rio Grande Trail Landscape,

or the PRGTL. The PRGTL is a single, large cultural resource, the Chuckwalla Valley portion of which subsumes the proposed project site and the geographic area upon which the PSEGS project would visually intrude. (See Exh. 2001, pp. 4.3-134 to 156, 4.3-158 to 161.)

The Chuckwalla Valley portion of the PRGTL is a diverse array of cultural and natural elements bound by the land of the valley itself. The elements include trail segments, archaeological features and deposits, traditional cultural places, particular vegetation associations, and water and mineral resources. Staff identified eleven traditional cultural places, five mountain resource areas, two mesquite resource areas, and an extant BLM ACEC (Area of Critical Environmental Concern), that manifest the ancient structure of Native American cultural beliefs with which the subject portion of Chuckwalla Valley has long been imbued. (Exh. 2001, pp. 4.3-151 to 153.)

Staff has determined that the Chuckwalla Valley portion of the PRGTL is eligible for listing in the California Register of Historical Resources (CRHR). It is eligible for listing on the CRHR for its associative, artistic and information values (CRHR Criteria 1, 3 and 4, respectively). The resource's further traditional values (a type of associative value under CRHR Criterion 1) are also eligible for the CRHR. (Exh. 2001, pp. 4.3-153 to 156.)

The direct visual effects of the PSEGS project, contrary to PSH's contention, are markedly different from those of the licensed PSPP. The construction and operation of PSEGS would introduce two very tall (750 feet or approximately 75 stories) and intense light sources into the middle of the Chuckwalla Valley portion of PRGTL, whereas the licensed project would have introduced a much more dispersed array of reflected light organized on near-ground trough structures with a much lower visual profile. PSH's argument, in opening testimony and at the evidentiary hearings, that the PSEGS project has virtually the same visual presence as the licensed project, does not take into account the stark difference in visual intensity that the proposed vertical solar power towers would have relative to the solar troughs of the licensed project. The question of the difference in visual effects is not, as the project owner has framed it, a question of whether the licensed or amended facility is more or less spatially visible at ground level. The question of the difference in visual effects pertains to the difference in the magnitude of the height, brilliance, and the intensity of the light that the amended facility would produce relative to the licensed project, and whether that difference in light intensity would substantively degrade the ability of the subject portion of PRGTL to convey its historical significance. (Exh. 2001, pp. 4.3-158 to 159.)

Staff determined that the PSEGS project's visual effect on the Chuckwalla Valley portion of the PRGTL meets the CEQA threshold for a significant effect on the historical resource. CEQA sets out a threshold for what constitutes a significant effect to an historical resource. (14 CCR §§ 15064.5 and 15064.7).The CEQA guidelines state that when a project may cause a "substantial adverse change in the significance of an historical resource" such a change would be considered a significant effect on the environment. A substantial adverse change, as set out in the guidelines, includes "alteration of the resource or its immediate surroundings such that the significance of an

historical resource would be materially impaired." Material impairment is, in turn, defined to include any material alteration to "those physical characteristics of a historical resource that convey its historical significance." The physical characteristics that convey historical significance are referred to among the historic preservation profession as aspects of resource integrity. These are defined in the CRHR regulations (14 CCR § 4852(c)) as location, design, setting, materials, workmanship, feeling, and association. Which of these aspects are important for an historical resource to retain its ability to convey its significance is dependent on the values for which that resource is determined to be significant. They are not all weighted equally. Some aspects better enable an historical resource to convey significance when the type of significance under consideration is a resource's associative values. Other aspects of integrity are more important to convey the significance of historical resources that are significant for design or construction values or for information values. As examples, for an historical resource determined significant for its associative value, integrity of setting, feeling, association, location, and materials are more important aspects of integrity than design or workmanship. For an historical resource determined significant for its information value, integrity of location, design, and material would be the primary considerations. (Exh. 2001, pp. 4.3-79 to 80.)

The significant increase in the intensity of the light that the PSEGS project would emit, relative to the licensed project, would materially alter the particular aspects of integrity (setting, feeling, and association) that enable the subject portion of PRGTL to convey its historical significance. This material alteration would constitute a material impairment of the historical significance of this portion of the landscape, and as such, would qualify as a substantial adverse change in the significance of an historical resource and a significant effect to the environment. As a consequence of this degradation to the landscape's integrity, staff has concluded that the construction and operation of the PSEGS project would have a significant and unmitigable effect on the Chuckwalla Valley portion of the PRGTL. (Exh. 2001, pp. 4.3-158 to 159.)

Staff proposes a suite of compensatory mitigation through revisions to Condition of Certification **CUL-1** from the original project's license that, while not reducing the amended project's effects to a less than significant level, would serve to ameliorate the loss of the Chuckwalla Valley portion of the PRGTL's ability to convey its associative values. (See Exh. 2001, pp. 4.3-159 to 161.)

Staff's proposed revisions to Condition of Certification **CUL-1** would seek to capture a comprehensive picture of the associative values of the Chuckwalla Valley portion of the PRGTL. The goal is to re-create or to engender at least some sense of the experience of the landscape for the general public through the landscape's description and through different modes of landscape interpretation. The intent behind the landscape's description and interpretation would be to try, to the extent feasible, to compensate the individual members of the public for what would be the potential loss of their ability to ever experience, first-hand, the multiple associate values that the landscape has to convey. While the loss of the ability to step into the existential experience of a relatively intact historical resource on the scale of a landscape can never be fully mitigated through documentation and public presentations of that resource, nonetheless, Staff

believes it to be in the public interest to gather the information and disseminate it in order to both compensate the public for the degradation of the landscape itself, and to foster a more comprehensive appreciation of the potential landscape loss associated with utility-scale renewable energy development. (See Exh. 2001, pp. 4.3-159 to 161.)

The primary effort to more thoroughly and definitively describe the resource by conducting class II pedestrian surveys would be augmented through the execution of a petroglyph study and a paleoenvironmental study. The petroglyph study would analyze and interpret many of the presently known petroglyph locales throughout the Chuckwalla Valley portion of the PRGTL, and weave a narrative of the ways in which these motifs may have worked to bind places and landforms with cosmology, myth cycles, and oral history to form the aboriginal concepts that were and are the subject cultural landscape. The paleoenvironmental study would potentially provide a reconstruction of the dynamic ecological character of the Chuckwalla Valley through time, of the environmental stage across which the PRGTL traversed and relative to which its control and use was shaped. Both investigations would serve to more completely compensate the public for the degradation of this portion of the PRGTL, and for the degraded existential experience of it. (See Exh. 2001, pp. 4.3-159 to 161.)

One further effort to facilitate the description and interpretation of the Chuckwalla Valley portion of the PRGTL would be to revise both the draft context of the Prehistoric Trails Network Cultural Landscape (PTNCL) and the draft field manual prepared for future recordation work for that landscape. The revision of the extant draft context would provide the opportunity to recast the prior conception of the PTNCL as simply another contributing element of the broader PRGTL and to fold in the new data about the Chuckwalla Valley portion of the latter landscape that would be the result of the three efforts above, i.e. the class II pedestrian surveys, the petroglyph study, and the paleoenvironmental study. Once in hand, the revised context would be used to inform the different public outreach initiatives which would most directly compensate the public for their loss of the experience of the landscape. The revision of the draft field manual would help to better manage the preservation of future recordation efforts for the landscape and to stream more consistent and finer resolution data into subsequent public outreach initiatives. (See Exh. 2001, pp. 4.3-159 to 161.)

Given the significant impact that the PSEGS would have on the PRGTL, Staff believes that the mitigation required in Staff's proposed Condition of Certification **CUL-1** is reasonable.

In an attempt to remove PSH's concerns that the requirements of Condition of Certification **CUL-1** creates "uncapped and potentially limitless financial obligations," (10/28/13 RT pp. 78-81) Staff hereby offers a proposed revision to Condition of Certification **CUL-1** to provide certainty as to the cost associated with this mitigation measure. The following table provides the amount of funding that would be required to be paid by PSH, and includes a breakdown of anticipated costs for the Condition of Certification **CUL-1** mitigation efforts.

PSEGS Mitigation Cost Summary CUL-1			
Studies	Estimated Costs	Tribal Integration as Percentage of Cost of Study	Total
Class II Surveys	$1,370,640	20% or $274,130	$1,644,770
Project Management Oversight	$185,550	10% or $18,560	$204,110
Paleoenvironmental Study	$200,000	15% or $30,000	$230,000
Petroglyph Study	$400,000	40% or $160,000	$560,000
Revision of PTNCL Context and Field Manual to Incorporate the Chuckwalla portion of the PRGTL	$83,000	5% or $4,150	$87,150
Public Outreach	$100,000	5% or $5,000	$105,000
Treatment for Cumulative Effects	$134,400	0%	$134,400
Total	$2,473,590	$491,840	$2,965,430

CUL-1 TREATMENT OF THE CHUCKWALLA VALLEY PORTION OF THE PACIFICTO RIO GRANDE TRAILS LANDSCAPE (PRGTL)

The project owner shall contribute to a special PRGTL fund that the Energy Commission will set up to finance the completion of the multiple programs under this condition, the purposes of which are to mitigate, in part, for the amended project's direct visual effects and cumulative physical and visual effects on the Chuckwalla Valley portion of the PRGTL. The Compliance Project Manager (CPM) will administer the disbursement of these funds and provide regulatory oversight for the implementation of the multiple programs.

Field Inventory and Documentation of PRGTL Contributing Elements

The project owner shall fund the design and conduct of reconnaissance pedestrian (class II) surveys of the Palen Mountains Resource Area1; the Coxcomb Mountains Resource Area2; the Eagle, Chuckwalla, and McCoy Mountains Resource Areas, as these areas are depicted in the FSA; the Coxcomb Fringe and Raceway Mesquite Areas, as also depicted in the FSA; and the BLM's Palen Dry Lake ACEC. The principal purpose of these surveys is to document a statistically valid sample of the archaeological deposits, and the potential prehistoric and ethnographic sources of natural resources in each of the subject areas. The primary, although not exclusive focus of the surveys shall be prehistoric archaeological resources that have the potential to be eligible for listing in the CRHR under Criteria 1 or 3. Resources encountered would typically include, but would not be limited to, rock art, intaglios, caves or other natural features that may evidence ritual use, apparent altars or shrines, cleared circles, rock alignments, rock cairns, caches, and trail segments. One secondary focus of the surveys shall be natural resource locales, places in the mountain and mesquite resource areas which may have been used as water sources, or places where plant, animal, or mineral resources may have been extracted. Such places may include springs, seeps, tanks, or plunge pools; stands of plants which have the potential to have been food sources or sources of medicinal compounds; habitats of high value animal populations; or mineral resource outcrops or deposits where materials such as high quality toolstones, quartz crystals, or turquoise may have been extracted. Another secondary focus of the surveys shall be any source of paleoenvironmental data such as packrat middens or pockets of perennially moist, organic sediments.

The research designs and the methods used for these class II surveys shall reflect the character of the different resource areas and include thorough documentation of each archaeological resource, natural resource extraction locale, and source of paleoenvironmental data. The sample design and the field methods for each mountain and mesquite resource area shall evidence a balanced consideration of local topographic constraints and the requirement to acquire a statistically valid sample of each area. The project owner shall fund the complete documentation of every archaeological site found on California State Parks DPR 523 Series forms per California State Parks instructions (CA State

[1] Staff envisions that the areal scope of the Palen Mountains reconnaissance be limited to the portions of the mountains in Secs. 13, and 24–26, T. 4 S., R. 17 E. and east of those sections into the unsectioned areas of T. 4 S., R. 18 E.; in Secs. 1 and 13, T. 5 S., R. 17 E., and east of those sections into the unsectioned areas of T. 5 S., R. 18 E.; and north of Secs. 31–33, T. 5 S., R. 18 E. into the unsectioned portions of that township.

[2] Staff envisions that the areal scope of the Coxcomb Mountains reconnaissance be limited to the portions of the mountains in Secs. 11 and 14, T. 4 S., R. 16 E. and northwest of those sections into the unsectioned areas of that township; in Sec. 22, T. 4 S., R. 16 E., and north of that section into the unsectioned areas of that same township; and in Sec. 16, T. 4 S., R. 16 E. and northeast into, again, the unsectioned portions of that township.

Parks 1995). The descriptions of resource assemblages and the spatial distribution internal to those assemblages shall be detailed enough on the subject forms to facilitate meaningful archaeological analysis of the surface manifestation of each archaeological resource. Documentation of potential natural resource extraction locales and sources of paleoenvironmental data shall include field notes and photographs of each such locale or source, vicinity and larger-scale location maps, submeter GPS coordinates, and, for rock and mineral sources, hand samples of the rocks or minerals sufficient for formal identification. The research designs for the mountain and mesquite resource areas shall also provide for chronometric, source, and other germane laboratory analyses.

The research design for the BLM's Palen Dry Lake ACEC survey shall include a thorough review of the BLM's extant documentation on the ACEC and any other extant peer-reviewed and proprietary literature to determine whether a statistically valid sample of the archaeological inventory of the area already exists, and, if that sample does not exist, the project owner shall fund the design and conduct of a further class II pedestrian survey to acquire the requisite supplementary data to complete that sample.

The project owner shall provide funds for Native American involvement in the design and execution of the fieldwork for these surveys, and in the interpretation and presentation of the results of the surveys.

The project owner shall fund the preparation of one or more comprehensive technical report(s) documenting the efforts to inventory and document the above contributing elements of the PRGTL.

Paleoenvironmental Study

The project owner shall fund the development and conduct of a paleoenvironmental study germane to the period of significance for the Chuckwalla Valley portion of the PRGTL. The purpose of the study is to provide an updated and more reliably informed paleoenvironmental context to enhance the interpretation of the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape. The research design for the study shall make use, at a minimum, of the available peer-reviewed and proprietary Quaternary science literatures, recent Quaternary research conducted in conjunction with the licensing and construction of the Genesis Solar Energy Project, the geoarchaeological research done in conjunction with the licensing and amendment processes for the amended project, new packrat midden analyses, and new Palen Dry Lake sediment core data.

The project owner shall provide funds for Native American involvement in the design and execution of the fieldwork for these surveys, and in the interpretation and presentation of the results of the surveys.

The project owner shall fund the preparation of a comprehensive technical report documenting the paleoenvironmental study effort.

Petroglyph Study

The project owner shall fund the development and conduct of a petroglyph study germane to the period of significance for the Chuckwalla Valley portion of the PRGTL. The purpose of this study is to provide for the integration of the numerous petroglyph sites within the PAA in one comprehensive study. The research design should incorporate recent studies conducted at the behest of Southern California Edison for mitigation related to the siting and construction of the Red Bluff substation's impacts to the North Chuckwalla Mountains Petroglyph District. Complete photo/GIS inventories of individual petroglyph motifs and of articulated motif panels shall be completed for Dragon Wash, Corn Springs, Chuckwalla Springs and McCoy Springs. In addition a reasonable sampling of the various smaller and disparate petroglyph motifs and panels throughout the Valley shall be inventoried. These disparate petroglyph sites can be ascertained from the list of known sites in the PAA that staff has collected as part of their independent analysis and from any newly discovered petroglyph sites located in conducting field inventories required above. Petroglyph data shall then be analyzed spatially to discern trends at a micro-site scale and at a macroscale across the Valley with other petroglyph sites and other cultural resources that contribute to the Chuckwalla portion of the PRGTL. A research design shall also propose targeted dating techniques (eg., patina analysis), including super-impositioning analysis on a relevant subset of the sites in the Chuckwalla Valley.

The project owner shall provide funds for Native American involvement in the design and execution of the fieldwork for these surveys, and in the interpretation and presentation of the results of the surveys.

The project owner shall fund the preparation of one or more comprehensive technical report(s) documenting the efforts to inventory, document and analyze the above contributing elements of the PRGTL.

Revision of Prehistoric Trails Network Cultural Landscape Context (PTNCL) and Field Manual

The project owner shall fund a contribution in an amount sufficient to finance the revision of the extant draft context for the Prehistoric Trails Network Cultural Landscape (PTNCL) and the PTNCL's draft companion field manual. The revision shall recast the subject context to more explicitly consider the trail routes in Chuckwalla Valley, and the cultural resources which are thematic constituents of those routes, as elements that may contribute to the historical significance of the Pacific to Rio Grande Trails Landscape. The final technical reports for the class II surveys of the mountain and mesquite resource areas, the paleoenvironmental study, and the petroglyph study shall inform the context revision.

Public Outreach

The project owner shall fund the production and distribution of video or web-based content the purpose of which is to interpret the Chuckwalla Valley portion of the PRGTL for the general public. The interpretive perspectives that are to inform said content shall derive from academe as well as from the Native American communities who ascribe heritage values to the valley.

The project owner shall fund initiatives the purposes of which are to directly, albeit partially, compensate Native American communities who ascribe heritage values to Chuckwalla Valley and, more specifically, to the broader PRGTL for PSEGS' degradation of the associative and emic ethnographic values of their ancestral homelands.

Verification:

1. The project owner shall transfer funds sufficient to complete the multiple programs set out in CUL-1 no later than 90 days prior to the initiation of ground disturbance anywhere on the project site.

2. No later than 10 days after receiving notice of the successful transfer of funds to the Energy Commission's special PRGTL fund, the project owner shall submit a copy of the notice to the Energy Commission's Compliance Project Manager (CPM).

b. Condition of Certification CUL-10. Flag and Avoid

Staff does not agree to PSH's proposed Condition of Certification **CUL-10** as stated in PSH's rebuttal testimony. However, Staff appreciates the Colorado River Indian Tribe's desire to avoid impacts to cultural resources as opposed to mitigating for impacts through data recovery. Staff offers the following proposed Condition of Certification **CUL-10**.

CUL-10 FLAG AND AVOID

If 1) resources within the transmission line corridor can be spanned rather than impacted, ~~**or resources within the solar field can be feasibly avoided by adjustment of individual heliostat,**~~ or 2) in the event that new resources are discovered during construction where impacts can be reduced or avoided, the project owner shall:

1. Ensure that a CRS, alternate CRS, PPA, or CRM reestablish the boundary of each site, add a 10-meter-wide buffer around the periphery of each site boundary, and flag the resulting space in a conspicuous manner;

2. Ensure that a CRM enforces avoidance of the flagged areas during PSEGS construction; and

3. Ensure, after completion of construction, boundary markings around each site and buffer are removed so as not to attract vandals.

In the event that the project owner believes that **a**ny historical **resource** in the solar field known prior to the onset of construction-related ground disturbance ~~can~~ could feasibly **be avoided** through an adjustment of a heliostat location or other minor project redesign, the project owner may submit, for the review and approval of the CPM, an avoidance plan to affect such avoidance. The project owner may submit one or multiple avoidance plans, as the project owner sees fit. The avoidance plan(s) shall specify the avoidance protocol that the project owner shall implement for each individual historical resource addressed in that plan. The CPM will review the plan(s) to verify that the proposed avoidance protocol would effectively avoid the disturbance of the specified historical resources. Avoidance plans, a template for which would be set out in the Cultural Resources Monitoring and Mitigation Report (CRMMP), would typically require brief (72 hours) CPM review. Historical resources for which the project owner obtains a CPM-approved avoidance plan shall be exempt from the **data recovery** requirements of ~~required by~~ **these conditions of certification** ~~shall not be performed~~**.**

c. Conditions of Certification CUL-11 through CUL-14. Data Recovery

Staff withdraws its objection and agrees to PSH's proposed modifications to Conditions of Certification **CUL-11** through **CUL-14** as stated in PSH's Opening Testimony.

d. Condition of Certification CUL-16. Compliance with BLM Programmatic Agreement

Staff recommends that the Energy Commission strike Condition of Certification **CUL-16** as the original condition was largely a result of what became disjointed Energy Commission and BLM environmental analysis schedules in 2010. Condition of Certification **CUL-16** now has the potential to inadvertently impede constructive collaboration on historic preservation issues relative to the Energy Commission's and the BLM's respective statutory and regulatory processes. (Exh. 2001, p. 4.3-176.)

Furthermore, this condition is not mitigation but a statement of the relationship between BLM and the Energy Commission when it comes to regulating the project which is on federal land. While the condition is included in the Final Decision, Staff believes the condition is no longer necessary because Staff feels confident issues can be worked out with BLM, eliminating the situation where PSH would be subject to conflicting requirements. In addition, the condition simply reiterates the existing legal relationship between federal and state agencies with shared jurisdiction over a project. (See 43 U.S.C. 1765 Terms and Conditions of a Right of Way.)

e. Condition of Certification CUL-17. Treatment of the Ironwood Historic Mining District.

The Ironwood Historic Mining District is an historical archaeological district. The district is made up of the physical ruins of the different mines which were once parts of the historic Ironwood Mining District. The district was primarily active from about 1904 through 1960. (Exh. 2001, pp. 39-40.) Staff has delineated one subarea within it, the Southwestern Palen Mountains Mining Area, and has recommended that this subarea be assumed eligible for listing on the CRHR for its associative and information values (CRHR Criteria 1 and 4, respectively). (*Id.* at p. 102.) The exclusive focus of the effects assessment for the mining district relates to the PSEGS project's potential to inflict significant visual degradation of the district's surface ruins, visual degradation that would compromise those ruins' ability to convey their historical significance.

Similar to the Chuckwalla Valley portion of PRGTL, the Southwestern Palen Mountains Mining Area of the Ironwood historic Mining District has the potential to have its associative values under CRHR Criterion 1 – whether the subject mining area may be associated with events or patterns of events important in local or regional history – compromised by the construction and operation of the PSEGS project. (Exh. 2001, pp. 4.3-102, 4.3-176.) Staff believes that the intrusion of the project's two solar power towers would significantly degrade the subject area's ability to convey that significance. (*Id.* at 4.3-176.)

Staff added Condition of Certification **CUL-17** to mitigate for the PSEGS project's potential to visually degrade the assumed historical significance of the Southwestern Palen Mountains Mining Area of the Ironwood Historic Mining District. (*Id.* at p. 4.3-4.) The proposed Condition of Certification **CUL-17** takes into account the visual potential of the PSEGS project to substantively degrade the historical significance of the Ironwood Historic Mining District. The implementation of Condition of Certification **CUL-17** would provide for compensatory mitigation in the form of a number of different types of data recovery investigations for archaeological resources and for analyses of historically sampled mineral deposits in that area as key data to inform the interpretive context of the area. (*Id.* at p. 4.3-176.)

2. BIOLOGICAL RESOURCES

Condition of Certification BIO-20. Sand Dune/Mojave Fringe-toed Lizard Mitigation

Staff and PSH are not in agreement as to the appropriate number of acres that should be required as mitigation for indirect impacts to Mojave fringe-toed lizards (MFTL) under Condition of Certification **BIO-20**. Basically, the parties disagree as to how many acres will be impacted enough to warrant mitigating for that impact.

Staff believes the 25% threshold for the reduction in sand-transport used for the PSPP should be maintained for the PSEGS project, whereas PSH believes that a 50% threshold or higher level is more appropriate. Staff and PSH experts disagree as to which threshold will result in actual degradation to MFTL habitat. (Exh. 2003, p. 25.)

Staff believes that the existing PWA model provides the best available data regarding sand transport in the region. (Exh. 2003, p. 23.) While Staff acknowledges that modeling for the PSEGS has limitations, the conclusions developed in this study are based on modeling supported by scientific research in the field of sand transport. (*Id.*) Staff finds that using the PWA model to predict the spatial pattern of sand transport reductions as a result of the project is the only way to provide a reproducible procedure for quantitatively assessing the extent of sand transport reductions, as has been demonstrated by its application to the PSPP's Reconfigured Alternatives 2 and 3. (*Id.*)

PSH indicated in their Opening Testimony that staff inappropriately relied on a flawed sand transport study and made incorrect assumptions which led to a severe overestimation of the project effects on the sand transport corridor. (Exh. 1077, PSEGS Biological Resources Opening Testimony, p. 9.) PSH believes that staff severely overestimated whether those effects would cause actual loss of Mojave fringe-toed lizard habitat. (*Id.*)

PSH would rather rely on a subjective and qualitative review of existing structures and effects. (Exh. 1077, PSEGS Biological Resources Opening Testimony, p. 10.) PSH does not provide any supporting data for these conclusions other than general descriptions of the sand transport system in the region. PSH has not specified what sand transport zones the surveyed areas occur in. Staff is unable to validate either the methods or the results of PSH's approach. (Exh. 2003, p. 23.)

Staff's evidence is more compelling because the use and validity of the model was previously adjudicated, and the Final Decision was predicated upon use of the model's results in developing appropriate mitigation. Following issuance of the Final Decision, no new information regarding sand transport in the region has become available, nor has the model been updated or changed in any way. In the absence of updated studies, staff continues to believe the current model provides a reasonable estimate to assessing impacts to the sand transport for the project area (Exh. 2003, p. 24.)

The most important area of disagreement between staff and PSH is the conclusions regarding the extent of degradation of habitat that should require mitigation. Staff considers indirect impacts from the disruption of sand transport as those resulting in the degradation of habitat – not just the complete functional loss of habitat for this species. This was the basis for staff's mitigation requirement of 0.5:1 for indirect impacts. (Exh. 2003, p. 23.) Mitigation ratios required for the complete loss of habitat ranged from 1:1 for stabilized areas to 3:1 for sand dominated communities. (Exh. 2003, p. 24.)

Staff agrees that there will likely remain some functional habitat for Mojave fringe-toed lizards in areas downwind of the project. (Exh. 2003, p. 24.) However, the loss of sand to the system is expected to increase the likelihood that the area will become "armored" or subject to stabilization from weeds. (Exh. 2003, pp. 24-25.) Like most species, Mojave fringe-toed lizards use a range of habitats to fulfill their living requirements. (Exh. 2003, p. 25.) Cablk and Heaton (2002) found this species prefers areas with a high percentage of sand (63-100 percent) and opined that to maintain existing Mojave fringe-toed lizard populations, more area than just the locally suitable habitat must be

identified for management. (*Id.*) It is not known, however, what quality levels can be attributed within this range of habitats, nor is it known for certain how these habitat types are being used by Mojave fringe-toed lizards. (*Id.*) Further investigation is warranted to better understand the use of this range of habitat, from pure sand to the composite of sand and perennial vegetation, now that this range has been better defined. (*Id.*) In the meantime, Staff maintains the previous approach – to require mitigation for the acreage subject to a 25-100 percent reduction of sand transport – is conservative for the Mojave fringe-toed lizard (*Id.*)

Studies have found that sand dune ecosystems, including their source sand and sand corridors, are necessary for the long-term survivorship of aeolian sand specialists, such as fringe-toed lizards. Similarly, suitable habitat exists within a matrix of heterogeneous conditions such as hummocks or pockets of soft sand with few annual species interspersed with hard packed sand and less suitable levels of vegetation and vegetation composition. Individuals are moving within this matrix of suitable and unsuitable habitat throughout the greater identified dune feature (Exh. 2003, p. 25.) It is clear that maintaining some level of sand transport through an area is a pre-requisite for maintaining fringe-toed lizard habitat. Therefore, a reduction of 25 percent or greater is a conservative threshold to use, given that Staff has no information on actual rates of sand transport in the project area. Staff's approach to mitigation acknowledges and encompasses the full habitat suites used by this species, and provides mitigation for impacts that degrade or have the potential to degrade habitat required by this species for their continued persistence in an area. (*Id.*)

PSH states that since percentage of sand blockage does not equal deflation, it cannot be argued that the resultant habitat would be unsuitable for Mojave fringe-toed lizard. PSH argues that it need only mitigate for impacts in the range of 50 to 100 percent reduction. (Exh. 1077, PSEGS Biological Resources Opening Testimony, p. 12.)

In conclusion, the threshold for a sand shadow registering as an impact was previously adjudicated. The Final Decision determined that an impact occurred if a given location experienced a reduction in sand of 25 percent or more. Staff considers the well-documented body of evidence to support the mitigation approach proposed by Staff in Condition of Certification **BIO-20**. This is the same conclusion adjudicated for the PSPP project and is based on existing studies and the principles identified above. Staff believes the effects of the project are predictable and the mitigation proportionate to the impact. To be consistent with the previously adjudicated impact threshold of 25 percent or greater, Staff concludes that 421 acres mitigated at 0.5 to 1 for a total of 210.5 acres is appropriate.

3. GEOLOGY AND PALEONTOLOGY
Condition of Certification PAL-9

Staff has determined, consistent with the Final Decision, that there is a high probability that paleontological resources exist beneath the surface of the project site. (PSPP Final Decision, Geological and Paleontological Resources, p. 3; Exh. 2000, p. 5.2-18 to 21.) Staff made this determination in accordance with the procedures established by the

Society for Vertebrate Paleontology, Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontologic Resources; Standard Procedures. (Exh. 2000, pp. 5.2-3, 5, 11, 22, 23 and 44.)

Staff has concluded that changes in construction methodology for the PSEGS project would result in the potential destruction of paleontological resources that could not be mitigated for under the existing conditions of certification. (Exh. 2000, p. 5.2-27; 10/28/13 RT p. 230.) Staff has proposed Condition of Certification **PAL-9** to mitigate this impact. (Exh. 2011.) Staff also determined that without the mitigation provided for in **PAL-9**, the PSEGS project would not comply with the Standards established by the Society of Vertebrate Paleontologists and the Bureau of Land Management Instructional Memorandum 2008-009, because there would be no mitigation for the potentially significant impacts caused by pylon insertion within the solar field. (Exh. 2000, p. 5.2-28.)

The approved PSPP was a solar trough project consisting of parallel rows of solar troughs built upon a uniformly flat surface prepared by extensive site grading. (PSPP Final Decision, Project Description p. 2 and Soil and Water Resources, p. 2.) While this construction method would permanently alter the surface of the land, during the grading and excavation operations, paleontological resources were expected to be uncovered and discovered during construction monitoring. (Exh. 2000, p. 5.2-26.) It is likely that in the course of the grading and excavation operation, some fossils would be damaged prior to discovery by observers. However, staff believes that numerous undamaged fossils would be discovered, collected, identified and curated and the results would have been made available to the scientific community. (PSPP Final Decision, Geological and Paleontological Resources, p. 11.) The scientific study of the recovered fossils is the mitigation for the fossils that would be irreparably damaged during construction. (*Id.* at p. 3-4; Exh. 2003, p. 35.)

Staff has also determined that rather than extensive site modification and grading which would yield discovery of paleontological resources, the PSEGS project proposes to drive 170,000 steel pylons, to a depth between 8 and 12 feet covering an area over 3,000 acres in size. The PSEGS project's use of vibratory installation method will not uncover paleontological resources – it will crush any resources within the path of the pylon. (Exh. 2000, p. 5.2-10; Exh. 2003, p. 34.)

Staff's proposed Condition of Certification **PAL-9** attempts to provide mitigation of this disturbance in a manner similar to that provided in the Final Decision by requiring the collection and curation of paleontological resources through a limited, but statistically significant, number of excavations throughout the heliostat field. (PSPP Final Decision, Geological and Paleontological Resources, p. 4; Exh. 2003, p. 35.) Condition of Certification **PAL-9** is intended to recover and curate a reasonable sample of paleontological resources that are likely to exist within the heliostat field, resulting in mitigation similar to what would have been required for PSPP. (Exh. 2000, p. 5.2-27; Exh. 2003, p. 35.) The PSEGS project would still be required to comply with the existing conditions established to provide mitigation in areas other than the heliostat field where traditional excavation methods would be used. (Exh. 2000, 5.2-22.)

PSH argues, contrary to determinations made in the Final Decision and Staff's analysis for this amendment, that this site should not be classified as high potential for containing paleontologic resources. (10/28/13 RT pp. 212-218.) However, PSH's expert agreed that this classification was correct under the SVP assessment protocol used by Staff to make this determination. (*Id.* at p. 217.)

PSH also argues that because the PSEGS project would require significantly less grading, impacts to paleontological resources would be less. (*Id.* at p. 218.) While Staff does not argue this contention, it believes the remaining impacts would still be significant given the high potential for paleontologic resources at this site, necessitating the mitigation proposed in Condition of Certification **PAL-9**.

The Committee should require Staff's proposed Condition of Certification **PAL-9** to mitigate for a potentially significant impact that would not otherwise be mitigated.

4. WORKER SAFETY FIRE PROTECTION Condition of Certification Worker Safety-7

Staff has determined that the PSEGS project would cause a significant direct impact on local fire protection services. (Exh. 2000, p. 4.14-1, 26.) A direct impact is caused by the need to equip and train the fire department to respond to the specific unique hazards posed by solar tower technology. (*Id.* at p. 4.14-1, 26-27.) While the Final Decision found the PSPP project would have a significant cumulative impact, Staff has determined that for the PSEGS project, no significant cumulative impact would occur because 1) the construction and operation of this solar power plant is not likely to change the overall hazard profile of facilities requiring emergency response in the county, 2) emergency events at this solar power plant are not likely to spread beyond the power plant site, and 3) emergencies are not likely to occur simultaneously with other facilities. (*Id.*)

PSH acknowledges that the PSEGS project will have impacts on the Riverside County Fire Department, and agrees that it should provide financial resources to the County to mitigate those impacts. (10/29/13 RT p. 232.) However, PSH and the County have not been able to reach an agreement outside of this administrative process on the appropriate amount of money that will mitigate the project's impacts. (*Id.* at p. 234; Exh. 2000, p. 4.14-26.)

In order to ensure that the project's impacts are mitigated, Staff has proposed Condition of Certification **WORKER SAFETY-7** to address the PSEGS project's direct impacts to the Riverside County Fire Department. (Exh. 2000, p. 4.14-1.) PSH objects to the level of mitigation that Staff proposes. The following table represents the positions of both Staff (see Exh. 2000, p. 4.14-37) and PSH (Exh. 1077, PSESGS Worker Safety and Fire Protection Opening Testimony at pp. 7-8):

	Worker Safety-7	PSH
One-time payment for capital improvements	$1,000,000	$1,200,000
Annually, during Construction for three years	$313,000	$684,000
Annually, during Operations	$313,000	$85,500
Annual Cost Escalator	CPI-U (approximately $1,600,000 over life of project)	None

Staff's approach to mitigation

Staff started with the original PSPP mitigation amount found in the current Condition of Certification **WORKER SAFETY-7**, which was $12,100,000 over a 30-year facility lifetime ($850,000 one-time payment for capital improvements and $375,000 annually for operations and maintenance). (Exh. 2000, p. 4.14-29.) This amount was based on individual and cumulative impacts determined by Staff using an Emergency Response Matrix to suggest mitigation to the project based on a weighting scheme for the various categories of fire department response and utilized professional judgment in the assignment of the "score" to the categories for four solar projects (Blythe, Genesis, Palen, and Rice) being processed by the Energy Commission at that time. (Exh. 2000, pp. 4.14-28 to 29; PSPP Revised Staff Assessment (RSA), Part I, pp. C.14-1, 24.) The total amount needed was based upon the Riverside County Fire Department's estimated costs in 2010 to expand their infrastructure and staffing in order to provide services to the four proposed solar plants in eastern Riverside County: three proposed along the I-10 corridor (Blythe, Genesis, and Palen) plus Rice located north of this corridor. (PSPP RSA, p. C.14-1, 21, 24; PSPP Final Decision, Worker Safety and Fire Protection p. 7.) With the exception of Rice which went a different way, each of the three I-10 corridor projects' mitigation level was the result of stipulated agreements between the applicants, the RCFD, and Staff.

In the period between 2010 and 2013, Staff re-evaluated the impacts of the proposed changes to two approved projects (Blythe from solar trough to PV, and Palen from solar trough to power tower) on the RCFD and determined that cumulative impacts were no longer likely when the proposed projects would eliminate the use millions of gallons of Heat Transfer Fluid (and in the case of Palen, large amounts of propane as well). Staff, in the FSA, discusses the SEGS 8 fire, which demonstrated the magnitude of fire department resources that can be required to respond to a fire at a large thermal solar facility using HTF. (Exh. 2000, p. 4.14-27.) Staff believes that absent HTF, the PSEGS

project would not contribute to a cumulative impacts (for this and other reasons stated above) and thus proposed a reduction in required mitigation. (Exh. 2000, p. 4.14-26.)

Staff has revised this Emergency Response Matrix to accurately reflect the impacts of the current projects either approved or under consideration by the Energy Commission in eastern Riverside County. (Exh. 2000, pp. 4.14-29, 61.) In order to give credit to PSEGS for eliminating the use of HTF, Staff compared the scores of PSEGS (2.4) with the Genesis project (2.8), a parabolic trough project using HTF, and applied that ratio (0.86) to the $12,100,000 required by the Final Decision, resulting in a proposed mitigation total of $10,400,000 over thirty years. (Exh. 2000, p. 4.14-30.) Subtracting $1,000,000 for capital improvements, $9,400,000 divided into 30 annual payments rounds to $313,000 per year for operations and maintenance. (Exh. 2000, pp. 4.14-37 to 38.)

Staff did not consider other projects in eastern Riverside County because Staff did not base the appropriate mitigation on this project's contribution to a cumulative impact. (10/29/13 RT p. 234.) Furthermore, the additional projects that PSH would like the Energy Commission to consider use PV technology, which the County has stated carries a much lower risk profile than either parabolic trough or power tower technology. (10/29/13 RT p. 243.)

Staff has also agreed with the County's request for a cost escalator, which would add approximately $1,600,000 to the total cost of this mitigation measure. At the evidentiary hearing, Staff stated that mitigation should be real and effective and in order for it to be so, inflation should not be allowed to erode the purchasing power of the mitigation payments. (10/29/13 RT p. 251.) At inflation rates experienced in the U.S. over the past 10 years, the purchasing power of the annual mitigation payment proposed ($100,000/year) would be reduced by 50% after 20 years and even further eroded by the end of the project's lifespan (30 years). Staff stated that since annual payments will be for Operations and Maintenance, it would be used for maintenance of equipment; replacement of equipment such as firetrucks, which have an average useful life of 20 years; and fire fighter salaries, which will certainly increase over time. (10/29/13 RT p. 250.) Therefore, without an annual escalator, the mitigation would no longer be adequate or effective.

PSH's approach to mitigation

PSH has approached its calculations of appropriate mitigation in a very different way than Staff. First, PSH offers a one-time payment of $1,200,000 to fund the estimated cost of a fully-equipped medium rescue unit, including training. Second, PSH proposes one amount for construction costs ($684,000 per year for three years) and another amount for operation costs ($85,500 per year). The annual construction payment represents the cost of funding one Fire Captain and half the cost of a firefighter to staff the medium rescue unit. Operations payment of $85,500 represents 1/8th of the annual cost of funding of $684,000). The 1/8th represents PSH's position that it should only be paying 1/8th the cost of staffing because PSEGS will only be one of at least eight

renewable energy projects within the County. (Exh. 1077, PSESGS Worker Safety and Fire Protection Opening Testimony, pp. 7-8.)

In the PSEGS Worker Safety and Fire Protection Opening Testimony, PSH provided a list of Solar Projects in Riverside County. Riverside County provided Comments at the Evidentiary Hearing that clarified which projects were actually in process within the County. (10/29/13 RT p. 233; Riverside County Comment Letter, TN201078.) To facilitate a better understanding the parties' positions, Staff provides a more accurate list of the active projects within Riverside County.

Project Name	Technology	B-29
Renewable Resources Group (CUP03685)	PV	Yes
Renewable Resources Group (CUP03684)	PV	Yes
McCoy Solar (CUP03682)	PV	Yes
Desert Harvest	PV	Unknown
Desert Sunlight	PV	No
Blythe (CEC)	PV	No
Genesis (CEC)	Solar Trough	No
Rice (CEC)	Solar Power Tower with Storage	No
Palen (CEC)	Solar Power Tower	No

Staff does not agree that an allocation of costs among all of these projects is proper for three reasons:

1. Staff does not believe that a cumulative impact exists. (10/29/13 RT p. 234.) As stated above, staff believes that mitigation is required for the direct individual impact this project has on emergency services in Riverside County.

2. The PV facilities listed by PSH do not present the same hazard profile during operations as a solar power tower (Exh. 2000, pp. 4.14-28, 36, and 61.) Indeed, as evidenced by Staff's Emergency Response Matrix, the need for emergency

services by a PV facility is much less than that of a solar tower. Even if a cumulative impact was present, the "equal" sharing of impacts by these eight facilities as proposed by the petitioner is hardly fair given the very unequal need for those services.

3. Many of the PV facilities listed by PSH are subject to the B-29 ordinance, which includes an annual escalator. Failure to include an annual escalator would allow the PSEGS project to assume less and less of the burden of mitigation each year.

Staff's position more accurately reflects the actual emergency response needs of the County to handle the direct impacts caused by PSEGS, and should be adopted by the Committee.

III. ALTERNATIVES

1. Staff's Alternatives Analysis is Thorough and Sufficient

As lead agency for the PSEGS, the Energy Commission is required to consider and discuss alternatives to the proposed amended project. The guiding principles for the selection of alternatives for analysis in an environmental impact report (EIR) are provided by the California Environmental Quality Act Guidelines (State CEQA Guidelines) (Cal. Code Regs., tit. 14, § 15000 et seq.). Section 15126.6 of the State CEQA Guidelines indicates that the alternatives analysis must:

- describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project;
- consider alternatives that would avoid or substantially lessen any significant environmental impacts of the proposed project, including alternatives that would be more costly or would otherwise impede the project's objectives; and
- evaluate the comparative merits of the alternatives. These regulations also apply to the document used as a substitute for an EIR in a certified program (Cal. Code Regs., tit. 14, §§ 15251 and 15252).

The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives (Cal. Code Regs., tit. 14, § 15126.6[a]). CEQA does not require an EIR to "consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives…." The range of reasonable alternatives must be selected and discussed in a manner that fosters meaningful public participation and informed decision making (Cal. Code Regs., tit. 14, § 15126.6[f]). That is, the range of alternatives presented in this analysis is limited to ones that will inform a reasoned choice by Energy Commission decision makers. Under the "rule of reason," an EIR "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" (Cal. Code Regs., tit. 14, § 15126.6[f][3]).

The lead agency is also required to (1) evaluate a “no-project alternative,” (2) identify alternatives that were initially considered but then rejected from further evaluation, and (3) identify the “environmentally superior alternative” (Cal. Code Regs., tit. 14, § 15126.6).

Alternatives may be eliminated from detailed consideration by the lead agency if they fail to meet most of the basic project objectives, are infeasible, or could not avoid any significant environmental effects (Cal. Code Regs., tit. 14, § 15126.6[c]).

Staff reviewed the previous alternatives analysis for PSPP to determine the appropriate scope of the analysis for the proposed modified project. The alternatives analysis for the PSPP retained three reconfigured alternatives, a reduced acreage alternative, and one off-site alternative for detailed analysis and comparison to the PSPP. No alternatives using other solar technologies were retained for detailed analysis in the previous alternatives analysis.

For the analysis of the PSEGS project, staff selected three project alternatives for detailed analysis and comparison to the proposed modified project:

- No-Project Alternative (Exh. 2000, pp. 6.1-24 to 50.)
- Solar Photovoltaic Alternative with Single-Axis Tracking Technology (Exh. 2000, pp. 6.1-50 to 74.)
- Reduced Acreage Alternative with Solar Power Tower Technology (Exh. 2000, pp. 6.1-74 to 90.)

Staff’s analysis of the PSEGS project broadens the alternatives analysis to allow full consideration of two renewable solar technologies other than BrightSource Energy’s SPT technology.

Staff considered, but did not retain for a detailed analysis the following alternatives:

- 500-MW Solar Power Tower with Lower Tower Height (Exh. 2000, pp. 6.1-10 to 12.)
- Solar Power Tower with Energy Storage (Exh. 2000, pp. 6.1-12 t0 14.)
- Off-site Alternatives (Exh. 2000, pp. 6.1-14 to 16.)
- Distributed Generation (Exh. 2000, pp. 6.1-16 to 21.)
- Energy Efficiency (Exh. 2000, pp. 6.1-21 to 23.)

In determining which alternatives to analyze in detail, staff considered the PSEGS project objectives which include (see Exh. 2000, p. 6.1-5):

- Deliver 500 megawatts of renewable electrical energy to the regional electrical grid to fulfill its existing approved power purchase agreements (PPAs) for electrical sales from the facility.
- Develop a solar thermal power plant at a site where some of the permits and other authorizations required for construction have been completed and/or obtained.

- Develop a site that is large enough to accommodate BrightSource Energy's Solar Power Tower technology.
- Develop a site that is in a BLM-designated Solar Energy Zone.
- Develop a site with an executed and approved Large Generator Interconnection Agreement for interconnection to a substation that would be operational in time to meet delivery of electricity under the approved PPAs.

Staff also retained some of the original project objectives from the PSPP and incorporated other basic objectives that are consistent with the state's renewable energy goals (see Exh. 2000, p. 6.1-5):

- Safely and economically construct and operate a utility-scale solar energy project of up to 500 megawatts.
- Develop a renewable energy facility that will supply clean, renewable electricity, and assist Southern California Edison in satisfying its California Renewables Portfolio Standard program goals.
- Ensure construction and operation of a renewable electrical generation facility that will meet permitting requirements and comply with applicable laws, ordinances, regulations, and standards.
- Develop a renewable energy facility in a timely manner that will avoid or minimize significant environmental impacts to the greatest extent feasible.
- Develop a renewable energy facility in an area with high solar value and minimal slope.

Staff's alternatives analysis was conducted according to the requirements set forth in CEQA. The analysis is more than sufficient under the law. It is thorough and certainly meets the goal of CEQA to foster meaningful public participation and informed decision making. Staff's alternatives analysis informs the Energy Commission on whether there are feasible alternatives to the project that will avoid or reduce significant immitigable environmental impacts.

2. Staff's Response to Specific Comments Raised by Parties.

a. Intervenors Claim Staff Should Have Analyzed In Detail Off - Site Alternatives

In comments on the PSA, and at Evidentiary Hearings, Intervenors Center for Biological Diversity (CBD) and Basin and Range Watch argued that off-site alternatives, specifically the Westlands Solar Park, should have been considered in detail.

Staff addressed these comments in the FSA and at hearings. Staff found that no alternative sites were identified that could be considered potentially feasible alternatives to the proposed PSEGS. (Exh. 2000, p. 6.1-7.) Staff noted that the range of alternatives required in an EIR is governed by the "rule of reason," meaning that an EIR need only set forth those alternatives necessary to permit a reasoned choice. Under the "rule of reason," an EIR "need not consider an alternative whose effect cannot be reasonably

ascertained and whose implementation is remote and speculative" (Cal. Code Regs., tit. 14, § 15126.6[f][3]). (*Id.*)

Staff reasoned that the proposed PSEGS is on a site that is approved for development of a utility-scale solar energy project, and as described in BLM's draft SEIS, it is the subject of the ROW application submitted by the project owner for the PSEGS. Given these facts, it is unlikely that any alternative site would be found to be potentially feasible (i.e., capable of being accomplished in a successful manner within a reasonable period of time). The work required to obtain site control and complete the required environmental clearances to allow development to proceed would likely render such an alternative infeasible. (*Id.*)

Staff specifically discussed the feasibility of the Westlands Solar Park as an off-site alternative in the FSA. Staff found multiple problems with this potential alternative, most notably that developed uses near Westlands Solar Park include rural residential areas and several small- to medium-size communities within approximately 5 miles to 10 miles of the site, and that PSH does not own or otherwise have development rights to lands at Westlands Solar Park. (6.1-8). As stated in the State CEQA Guidelines, among the factors that may be taken into account when addressing the feasibility of alternatives is "whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site…" (Cal. Code Regs., tit. 14, § 15126.6[f][1]). Also, construction and operation of a solar power plant with SPT technology at Westlands Solar Park would be completely inconsistent with the planned intent to develop the area with much lower profile solar PV arrays. (6.1-8). Staff concluded that development of any type of solar energy project by the PSH at Westlands Solar Park is extremely speculative, and did not warrant further analysis. (*Id.*)

b. PSH Claims that Staff Has Not Appropriately Analyzed the Importance of Some Project Objectives

Staff acknowledges that it gave little consideration to the project owner's contractual obligations in this analysis of project alternatives, but did note that each of the two 250-MW units has an approved PPA, and that approval of the PPAs by CPUC demonstrates that CPUC deems the PSEGS appropriate for helping to meet the state's RPS program goals. Staff also noted that once a PPA is approved, submittal of an amended advice letter to CPUC requesting an amended PPA is required unless the change to the project was accounted for in the original PPA (e.g., a PPA that allows a change in technology). Staff does not have information necessary to determine whether changing the technology of the PSEGS would require amending the PPAs. It is also unknown whether the CPUC would approve amendments to the PPAs allowing any change. (Exh. 2000, pp. 6.1-28 to 29.)

Staff also noted that PSH has a Large Generator Interconnection Agreement (LGIA) with CAISO for 500 MWs of interconnection rights to deliver electricity from the PSEGS to SCE's Red Bluff Substation. Staff noted that a schedule delay could result in a project's failure to meet its milestones and a breach of the LGIA. Staff noted that changing the project technology could at least cause a project schedule delay, and it is

not known at what point a project schedule delay would affect project viability. (Exh. 2000, p. 6.1-29.)

Staff also noted that because BLM is considering the project owner's ROW application and revised POD for the PSEGS and has published a draft SEIS for the project (BLM 2013a), changing the technology could require submittal of another revised POD to BLM, which could also delay the project schedule. (Exh. 2000, p. 6.1-29.)

While Staff has carried the burden of determining that there are environmentally superior alternatives that can reduce or eliminate significant environmental effects, PSH carries the burden to demonstrate that these alternatives are infeasible and the project should receive findings overriding considerations.

IV. SOIL AND WATER RESOURCES PSEGS Groundwater Pumping, the Colorado River, and the Bureau of Reclamation's Unadopted Accounting Surface Rule

The Colorado River Board (CRB) and the Metropolitan Water District (MWD) are concerned that the PSEGS project would pump groundwater that would be eventually replaced, in part or in total, by Colorado River water. Consumptive use of water from the Colorado River is allocated pursuant to federal law. In order to use Colorado River water an entity must have an entitlement to do so under federal law. (See Exh. 2000, pp. 4.9-54 to 56, 96.)

The CRB and MWD contend that the PSEGS project groundwater use is from a groundwater basin that is hydrogeologically connected to the Colorado River, within an area referred to as the "accounting surface". The extent of the "accounting surface" area was determined by the U.S. Geological Survey and U.S. Bureau of Reclamation as part of an ongoing rulemaking process to determine if pumping would affect entitlements on the Colorado River. The federal government (Bureau of Reclamation) has not, however, adopted the rule and there is no regulation in place to determine whether a project would affect entitlements. It is not known if and when a rule may be adopted. The Bureau of Reclamation has provided no specific guidance to staff on how they should determine if there is an effect on the Colorado River entitlements. Therefore, Staff cannot condition the project to ensure compliance with a regulation or guidance that does not exist at this time. Staff understands that if at some point in the future the Bureau of Reclamation finds the PSEGS project is affecting entitlements on the river they may assert authority to require an offset or cease pumping. However, this action would be outside the Energy Commission authority.

Staff's determination of potential impacts to the Colorado River and mitigation requirements is based on a CEQA analysis. Condition of Certification **SOIL&WATER-14** requires the project owner to prepare a water supply plan to mitigate project impacts to surface water, including the Colorado River, and implement Condition of Certification **SOIL&WATER-17** to determine what volume of water must be offset through the water supply plan. Staff notes that the amended project water use has gone down from the amount evaluated in the PPSP Final Decision therefore there is a proportionate

reduction in the potential impact of PSEGS to the Colorado River. In addition, the methods of mitigating potential impacts identified in **SOIL&WATER-14** are appropriate for offsetting affects in the Colorado River watershed. Staff believes Conditions of Certification SOIL&WATER–14 and -17 will provide the flexibility to address MWD's and CRB's concerns regarding the impacts on their entitlements and looks forward to working with them to review and comment on the water supply plan as requested.

Staff believes the conditions of certification are sufficient to ensure there are no environmental impacts from project pumping and no changes are proposed.

V. STAFF'S RESPONSE TO COLORADO RIVER INDIAN TRIBES' EXHIBIT 8020 PROPOSED CHANGES TO CONDITIONS OF CERTIFICATION

Since November 2012, the Energy Commission has been subject to the Governor's Executive Order B-10-12, which directs state agencies to cooperate, collaborate, communicate, and consult with tribes concerning the resources that the state has responsibility to protect or manage and that tribes have an interest in preserving. The Resources Agency has also finalized its policy that further clarifies the Governor's directive and further directs the departments and commissions within the Resources Agency to develop specific consultation policies related to respective agency missions. The California Energy Commission is in the process of finalizing a draft consultation policy.

There are resources existing within or impacted by the PSEGS project that the Energy Commission has a responsibility to protect and that affiliated Native Americans have an interest in preserving.

Intervener Colorado River Indian Tribes (CRIT) Exhibit 8020 objects generally to 1) the routine use of data recovery as mitigation for damage or destruction to archaeological resources, and 2) the formulation of a Cultural Resources Mitigation and Monitoring Plan (CRMMP) after project amendment approval, with little or no tribal input.

CRIT proposes revisions to **CUL-5**, **CUL-7**, **CUL-8**, **CUL-9**, **CUL-10**, **CUL-11** and **CUL-12**, that in summary, would provide enhanced abilities for tribal participation in project construction compliance processes. Staff, to the extent feasible, and consistent with the Energy Commission's statutory and regulatory obligations, concurs with the intent of CRIT's requests. Any accommodation of CRIT's suggested changes would ostensibly apply to all of the tribes with whom staff has actively consulted during our consideration of the amendment for the PSEGS project, should the amendment be granted. At the present time, although Staff concurs conceptually with the intent of CRIT's requests, Staff does not concur with CRIT's specific proposed changes to the above cited conditions. As proposed, CRIT's edits to the conditions would inadvertently alter underlying Energy Commission compliance processes, would make overall cultural resources compliance less efficient, and would introduce unnecessary redundancies in the compliance effort. Upon the Committee's request, Staff could prepare edits to the subject conditions to facilitate most of the greater involvement in our compliance

process that CRIT seeks, while maintaining the relatively efficient flow of our overall compliance processes.

VI. STAFF RESPONSE TO COMMITTEE QUESTIONS

1. Regarding the Federal Migratory Bird Act, the Bald and Golden Eagle Protection Act, and the Fully Protected Species Act, please brief whether incidental take permits are available, necessary, and at what point permits would be required for a project's take of species covered under the above-mentioned laws.

a. The Migratory Bird Treaty Act

The Migratory Bird Treaty Act [16 U.S.C. §§ 703-712] (MBTA) does not provide a permit for the incidental take of migratory birds. Under the MBTA permitting regulations, "No person may take… any migratory bird …except as may be permitted under the terms of a valid permit issued pursuant to the provisions of this part and part 13 of this chapter…" (50 C.F.R. § 21.11.) The regulations include permits for activities such as banding or marking, scientific collection, taxidermy, falconry, and rehabilitation; but not incidental take.

The Migratory Bird Treaty Act does not provide a threshold of take; there is no "allowable" number of birds that can be harmed or killed. However, the project's kill of birds through collision or flux exposure would not likely be considered a violation of the Migratory Bird Treaty Act if unintentional and consistent with all agency mitigation requirements and recommendations. This conclusion results from an analysis of federal case law, which in turn both affects and reflects the prosecutorial efforts of the Service and the Solicitor. The case law is complex and varies importantly within the federal circuits. However, it is unlikely that the project owner would ever be charged with, or convicted for, violating the Migratory Bird Treaty Act, particularly with the adoption of staff-proposed Conditions of Certification **BIO-16a** and **BIO-16b**, which require multiple mitigation measures including retrofitting non-compliant utility poles and installing bird diverters on utility lines to reduce electrocution and collision risk with transmission lines and poles in the region; the funding of additional migratory bird conservation measures; and the preparation of a Bird and Bat Conservation Strategy that will require surveying and monitoring of onsite and offsite avian use and behavior; surveying and monitoring to assess levels of avian and bat mortality and injury from collision and solar flux and to determine patterns associated with when these events are likely to occur; and an adaptive management program for reviewing, characterizing, and responding to quantitative survey and monitoring results. (Exh. 2000, p. 4.2-289 to 296.)

Typically, prosecution of commercial projects, including wind farm projects with potentially huge impacts to birds, has not occurred under the Act if the project pursues adaptive efforts to reduce impacts in consultation with the Service and state regulatory agencies. An examination of lower court cases indicates that prosecution of commercial activities that resulted in the death of birds usually followed the defendant's failure to correct its activities after being encouraged to do so by the Service, or illegal activities in

the first instance. Commercial activities that consult with the Service and make efforts to avoid or reduce bird deaths do not typically result in reported case law. A doctrine of selective enforcement of the Act has been expressly set forth by the Service for wind energy projects (USFWS, Service Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines (May 2003).) The guidance notes that although there is no provision under the Act for authorized take, some birds may be killed by wind turbines despite the implementation of reasonably protective measures, implying that good faith efforts count where prosecution is possible.

Thus, while it is impossible to be certain how the Act would be applied to the PSEGS project, prosecution (and conviction) seems unlikely if Applicant is cooperating with state and federal regulatory authorities to avoid or reduce bird kill. **BIO-16a** and **BIO-16b** provides a mechanism to assure that cooperation.

b. The Bald and Golden Eagle Protection Act

The BGEPA prohibits the taking, possession, and transportation of bald and golden eagles within the United States without a permit. The USFWS includes the act or attempted act of wounding, killing, molesting, or disturbing bald or golden eagles in the definition of "take." (16 U.S.C.A. § 668(c).)

The U.S. Fish and Wildlife Service issues permits for the limited take of bald and golden eagles where the take is associated with otherwise lawful activities. (50 C.F.R. § 22.26(a).) These permits authorize the take of eagles "where the take is compatible with the preservation of the bald eagle and the golden eagle; necessary to protect an interest in a particular locality; associated with but not the purpose of the activity; and (1) For individual instances of take: the take cannot practicably be avoided; or (2) For programmatic take: the take is unavoidable even though advanced conservation practices are being implemented." (*Id.*) A "take" permit may be issued by FWS if these criteria are met by the project.

Take permits are voluntary. The USFWS does not proactively "require" a project to have take permit, but a permit may be available to a project that applies and meets the above stated criteria. But if a project takes a bald or golden eagle without a take permit, the project would violate the BGEPA and would be subject to prosecution. However, as with the MBTA, prosecution does not necessarily follow the take of a bald or golden eagle.

As far as staff is aware, the project owner has not elected to apply for a BGEPA take permit at this time. And the BLM, in consultation with USFWS, has not required a BGEPA take permit through the PSEGS project's federal process.

Implementation of Condition of Certification **BIO-16b** would avoid take of golden eagles by monitoring eagle nests during construction and implementing adaptive management measures, and **BIO-16a** would benefit bald and golden eagles by requiring project monitoring and providing funds for various habitat conservation and enhancement measures that would benefit both bald and golden eagles by improving habitat and lessening the risk of electrocution by contacting power lines. Conditions of Certification

BIO-12 and **BIO-21** would provide suitable bald and golden eagle foraging habitat by requiring the acquisition of desert tortoise habitat similar to that lost at the project site, as well as acquisition and permanent protection of desert dry wash habitat. While acquisition does not address the net loss of foraging habitat in the immediate future, it would prevent future losses of habitat by placing a permanent conservation easement and deed restrictions on private lands.

These golden eagle conservation specifications indicate that the Energy Commission is working with USFWS in compliance with the BGEPA, 50 C.F.R. § 22, to ensure that golden eagles will be as minimally impacted as possible.

Staff also noted in the FSA that the REAT agencies (California Energy Commission, California Department of Fish and Wildlife, Bureau of Land Management, and United States Fish and Wildlife Service) are working together to develop a Desert Renewable Energy Conservation Plan (DRECP), a science-based process for reviewing, approving, and permitting renewable energy applications in California. Once the DRECP is complete, the plan will be a state Natural Communities Conservation Plan (NCCP) and a federal Habitat Conservation Plan (HCP) that will provide tools to expedite coordination of federal and state endangered species act permitting.

When the DRECP is completed, and if the DRECP includes the PSEGS site as expected, the take of golden eagles would be covered. (Exh. 2000, p. 4.2-17.)

c. Fully Protected Species

Fish and Game Code section 3511 identifies13 specified species of birds which may not be taken or possessed at any time for any purpose except necessary scientific research. Under California law, “take” means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill. (Fish & Game Code § 86.) Staff has stated that, at least at this time, take of any fully protected species by the PSEGS project is prohibited by law and noted that the burden is on the project owner to avoid any such take. (Exh. 2000, p. 4.2-6.)

Staff has stated on numerous occasions that is impossible to divine exactly which species will be killed by this project. (Exh. 2000, pp. 4.2-6, 203, and 232; 10/29/13 RT pp. 171, 182.) Staff can identify the species that have been seen on or near the project site, but can only speculate as to which and how many birds will actually be injured or killed. (Exh. 2000, pp. 4.2-154, and 232.) Staff has identified fully protected species on or near the project site. (Exh. 2000, pp. 4.2-41 to 42.) But a violation of the fully protected species statute will only occur if and when a fully protected species is killed. Thus, staff has determined that at this time, the PSEGS project would comply with LORS. (Exh. 2000, p. 1-5.)

As mentioned in the section above regarding the Bald and Golden Eagle Protection Act, the REAT Agencies are currently developing the DRECP, which will be a state NCCP. Last year the Legislature gave the California Department of Fish and Wildlife the authorization to allow take of the fully-protected golden eagle as a covered species in a

NCCP. (Exh. 2000, p. 4.2-17.) Therefore, the DRECP (an NCCP) is anticipated to provide coverage for some fully protected species, including the golden eagle. If the project falls within a development focus area as determined by the final DRECP, as is expected, then it is possible that the PSEGS project owners will eventually be able to apply for a take permit of otherwise fully protected species through the DRECP. (Exh. 2000, p. 4.2-168.)

2. Based on evidence in the record, what should the Committee conclude about the likely or potential magnitude of the impact of this project on avian mortality? What metrics should the Committee consider applying to weigh this impact as called for in Public Resources Code §§ 21081 and 25525?

a. The Committee Should Conclude That This Project Would Have a Significant and Unmitigable Impact to Avian Species Under CEQA.

Staff has recommended that the Commissioners find that the project would result in a significant and unmitigable impact to avian species under CEQA. This conclusion is based on a number of factors including that the site is located in a migratory area, there is potential for large numbers of birds to be exposed, and the risk to birds from solar flux has been demonstrated.

The PSEGS site is located in a region that supports migratory birds. There are records for at least 425 avian species from 18 orders and 55 families in the region. Of these, approximately 350 species are characterized as Neotropical migrants who pass through the region during spring and fall migrations. These birds include various raptors including Swainson's hawks, turkey vultures, and numerous passerines – some of which include least Bell's vireo, southwestern willow flycatchers, many hummingbirds, and various warblers. Shorebirds and other waterfowl are common migrants that also have the potential to occur in the project area. (Exh. 2000, pp. 4.2-140 to 141.)

There is potential for large numbers of birds to be exposed to solar flux and collision dangers. The project site and Chuckwalla Valley provide foraging, cover, and/or breeding habitat for a wide variety of resident and migratory birds. Localized water sources such as Lake Tamarisk are known to attract birds as are irrigated agricultural areas including the palm and jojoba groves that abut the PSEGS project site. Artificial ponds, including the small cement lined reservoir located at the northwest corner of the site are also expected to attract a variety of birds. (Exh. 2000, pp. 4.2-140 to 141.)

The risk to birds from solar flux has been demonstrated. Exposure to solar flux has the potential to result in direct and indirect effects to birds by temporarily or permanently damaging their eyes, including the loss of sight; burning or singeing feathers; compromising the molecular structure of feathers (i.e., non-visible damage); and secondary, non-visible physiological changes including elevated body temperatures or thermal stress. In some circumstances exposure to elevated levels of solar energy flux (see Exh. 2000, pp. 4.2-420 to 435) may result in the death of the bird either immediately or within a short period of time following exposure. The potential for injury

depends on a variety of factors including the size and type of bird; length of exposure; and the level of solar energy flux. (Exh. 2000, pp. 4.2-154 to 155; 420 to 435.)

McCrary et al. (1986) found that 13 of the bird carcasses (19 percent) at the Solar One facility had been burned, reporting that the "heavily singed flight and contour feathers indicated that the birds burned to death." (see Exh. 200, p. 435). The authors interpreted these mortalities as the result of birds flying through that facility's standby points (i.e., areas of concentrated solar energy) though they did not observe the incidents, and that mortalities may have been caused by flying within elevated flux levels surrounding the SRSG during normal operation. (Exh. 2000, p. 4.2-155.) Birds exhibiting signs of damage from exposure to solar flux have also been detected at the Ivanpah Solar Electric Generating Station (ISEGS). A review of the September and October 2013 Avian Mortality Reports identified a number of birds with melted or charred feathers. (Exh. 3057 and Exh. 3089.)

Staff has determined that feasible mitigation to reduce impacts to avian species from collisions or exposure to elevated levels of solar energy flux or irradiance to below the level of significance may not exist. (Exh. 2000, p. 4.2-168.) This is because feasible mitigation to avoid bird mortality has not been identified, and mitigation may not adequately replace birds in the local population that may be killed by collision or solar flux exposure, particularly special-status birds. (Exh. 2000, p. 4.2-168 to 169.)

As discussed above, Staff believes the PSEGS is in compliance with all applicable LORS and will not require a special finding required in Public Resources Code section 25525. However, Staff has recommended that the Commissioners find that the project would result in a significant and immitigable impact to avian species under CEQA. This conclusion is based on a number of factors including that the site is located in a migratory area, there is potential for large numbers of birds to be exposed, and the risk to birds from solar flux has been demonstrated and the full significance of the impact cannot be determined at this time. Due to these circumstances, it is unknown if the suite of mitigation proposed by Staff will be able to adequately mitigate or avoid the significant effects of solar flux on avian species. Furthermore, Staff believes it has identified feasible alternatives that would avoid the project's impacts from solar flux. Therefore, Staff does not recommend the Commission make override findings required in Public Resources Code section 21081.[3]

b. It Is Not Possible to Determine or Apply a Metric to Weigh This Potential Impact

While Staff believes there are feasible alternatives to PSEGS as proposed, it has worked diligently to develop a suite of mitigation and adaptive management measures that may be able to mitigate the unknown potential impacts from solar flux should the project be approved, constructed and operated. However, there is no standard metric for determining how many of a given bird can be safely "taken". While CEQA guidelines

[3] Staff has prepared a statement regarding its position on overriding considerations that is appended to this brief.

provide general thresholds for significance, they do not provide a particular number but rather refer to “substantial” impacts.

For many species, any metric we apply at this time will be arbitrary and not based on any reasonable, scientific-based approach. For example, if we remove several birds from a large stable population, these effects are not likely to reduce overall population levels or compromise the ability of that population to persist. Mitigation can be applied and the effect reduced to less than significant levels. Conversely, removing the same number of birds from a declining, small, or isolated population could result in a collapse of that population, even with mitigation.

Additionally, many species will experience variations in population size in response to factors not related to the PSEGS, including weather, access to prey, or other disturbances. To apply a metric that is suitable for a population that is currently stable may not be appropriate if, for example, a population later declines because of multiple years of drought.

Another important consideration is that many birds injured by the PSEGS may be undetectable. Birds may fly through the solar flux and be critically injured, but will be able to fly away from the project site. Staff cannot at this time quantify how often this may occur, and without that, a particular threshold number would not be a reliable measure of acceptable mortality. (Exh. 2000, p. 4.2-163.)

The only metric available is for species under federal or state protection. Staff has conferred with representatives of USFWS and CDFW, and posed the question, “if an operating project took a species under federal protection (ESA Section 7) or state protection (Section 2081 of California Fish and Game Code), at what level of take would the project owner be requested to apply for appropriate permits?” The answer from state and federal agencies was that the threshold is one individual take. (Personal communication between Carol Watson, Ann Crisp, Chris Huntley, and the REAT team.). However, Staff can only speculate as to whether a particular species will actually be taken at the PSEGS. While any bird within in the project vicinity has the potential to collide with a PSEGS project structure or be harmed by solar flux, there is no certainty as to which birds will. Because of this uncertainly, Staff cannot say that this project will not comply with LORS. Just as there is the possibility that a protected species will be taken, there is a possibility that a protected species will not be taken.

Instead of coming up with a metric, Staff’s approach is to require the development of a bird and bat plan. Condition of Certification **BIO-16b** (Avian and Bat Surveys, Monitoring and Adaptive Management), outlines an extensive onsite program designed to monitor operational effects, if any, and to outline a pathway toward managing those impacts on an ongoing basis. These efforts would be memorialized in a Bird and Bat Conservation Strategy, or BBCS. Conditions of Certification **BIO-16b** details various efforts, including monitoring bird and bat use at the site, evaluation of wildlife behavior at the project site in comparison with behavior of birds in an unaltered environment; implementing onsite mortality and injury monitoring to gauge operational effects of the project; identifying conservation measures to minimize impacts, and developing and implementing an

adaptive management framework to respond directly to the results of project monitoring. The condition proposes monitoring golden eagle nest locations within 10 miles of the project site. (Exh. 2000, p. 4.2-165.) Implementation of **BIO-16b** would require the project owner to monitor, record, and report bird deaths and injuries from project construction and operation. Monitoring the project's operational impacts for seasonal factors, the species of birds affected, and the types of injuries or mortalities that occur have also been requested by the USFWS. This type of monitoring is considered crucial in documenting bird behavior, noting responses to stress, quantifying impacts, and subsequently identifying and implementing any available measures to avoid, minimize, or mitigate these impacts. (Exh. 2000, p. 4.2-168.)

Condition **BIO-16b** requires development of avian, bat, and golden eagle protection plans. These plans require development of project monitoring methodology and implementation of compensatory mitigation according to clear performance standards provided in the condition, should monitoring reveal significant impacts to avian or bat species. This mitigation shall be implemented as needed based on the levels of take revealed by monitoring, and would detail all appropriate minimization and compensatory actions, as determined in consultation with USFWS, CDFW, BLM, and the Energy Commission. These actions would vary from restoration of avian habitat that supports the species impacted by the project, power line retrofits or other means of minimizing take and enhancing habitat, and will allow for flexibility in measures imposed, based on effectiveness monitoring. These plans will also incorporate a means of accounting for individuals that may suffer damage from exposure to elevated levels of solar flux, yet still be capable of flying off the site. These animals would not be detected during onsite carcass searches, yet would be adversely impacted by the project.

At the hearings, Staff further articulated a preference to avoid metrics or particular thresholds. (10/29/13 RT p. 171.) Instead, Staff supported the use of the BBCS to monitor and collect data and then the Technical Advisory Committee (TAC) would have actual data on the numbers and types of birds impacted. The TAC would use that information to develop thresholds and recommend approaches for mitigation and conservation that are tailored and appropriate based on actual findings. (10/29/13 RT pp. 171, 182.)

Staff acknowledges that while it is reasonably foreseeable that birds will be harmed, we do not know the exact suite of species or their numbers. Staff believes it is not possible to come up with a meaningful threshold at this time. (10/29/13 RT p. 171.)

3. **Should the Energy Commission require the project to take additional steps to avoid avian mortality, including possible curtailment, if project operations were to result in excessive avian mortality? If so, what metric should be used to establish a maximum limit that would trigger a curtailment recommendation?**

In order to address Staff's determination that the PSEGS project may result in significant and immitigable direct, indirect and cumulative impacts to avian species under CEQA, Staff and PSH have agreed to various mitigation measures, one of which

is an adaptive management program. First, Staff is requiring extensive surveys and monitoring to estimate the actual extent of bird deaths caused by the PSEGS. Second, Staff has established a Technical Advisory Committee that will review that data and make recommendations regarding the best use of the required mitigation funds and to suggest appropriate adaptive management measures. With actual data on which birds and how many are being harmed, the TAC can tailor appropriate mitigation and adaptive management measures to address the specific, actual harms that are found. These adaptive management measures will include funding of particular mitigation activities and will also include avoidance measures. Suggested mitigation activities and avoidance measures will be based on actual findings. For example, if large numbers of water or shore birds are detected, mitigation may focus on restoration of habitat for these specific species; if riparian birds are heavily impacted, invasive species trapping may be suggested; or if large numbers of resident desert species are impacted, then focusing mitigation on enhancing desert and desert wash/riparian habitat through efforts such as weed and trash removal may be recommended.

As for avoidance measures, Staff is aware of a variety of methods and tools that are used to divert birds from an area, such as airports and farm fields. However, Staff is not aware of the efficacy of these methods on a project site of this scale. Multiple techniques were suggested by PSH in their avian plan and include noise makers, flagging, balloons, vehicles, etc. Other novel techniques such as unmanned vehicles or radio controlled aircraft may have some value in diverting large flocks of birds away from the flux field. Staff does acknowledge that some avoidance measures, including the use of focused light or noise, may require prior approval from the CDFW and USFWS, may require additional impacts assessment, and may result in offsite impacts. Staff recommends adopting all feasible means to reduce bird mortality.

At this time, Staff has not recommended curtailment. (10/29/13 RT p. 172.) For purposes of this discussion, Staff is assuming that curtailment is not a simple reduction in electricity output or a movement of some or all mirrors to the standby points, but is defined as the elimination of the concentrated solar flux by moving all mirrors to stow, thereby shutting down power production. Staff assumes that avian curtailments would result in lost output, lost revenue, and increased power plant maintenance from more frequent cycling of the power block equipment. Any recommendation on curtailments should consider these factors as well as the efficacy of avian/flux interaction predictions.

Curtailment would not be effective for large numbers of resident birds with behavioral and flight patterns that would make them difficult to detect, such as small, low-flying and/or fast-flying species like swifts and swallows. Staff believes these are the species with the greatest potential to suffer adverse effects from exposure to solar flux. (Exh. 2000, p. 4.2-156.) Curtailment would also not be effective in low-light situations when flux is not present, such as a new moon or cloudy conditions, if for example, migrating birds either in flocks or individually perceived the field as water and attempted to land, and collided with mirrors.

Staff would recommend curtailment in the future if project-specific data indicates a predictable event that would result in extreme damage to a population. An example

would be if a large kettle of Swainson's hawks or other large group of special-status bird such as sandhill cranes or bald eagles were expected to fly through the flux field over a certain span of time each year, or if they appear to be circling the site with intent to land, having perceived the site as suitable stopover or landing site and therefore to be in clear risk of injury or mortality. Such an event, whether routine or infrequent, would be extremely damaging to a local population, or to a species experiencing a range of negative habitat pressures. Eliminating solar flux in this type of situation could be effective in avoiding significant and immitigable impacts to special-status species, where after-the-fact-mitigation would be a poor substitute for impact avoidance.

Only close monitoring of the site and careful effectiveness monitoring of adaptive measures will provide the ultimate answers to these questions. Staff believes that **BIO-16a** and **BIO-16b** provide the flexibility required to address actual harms, and believes this approach is required when it is problematic to pre-determining specific mitigation measures which would be based on speculation of possible impacts.

4. **Regarding the Technical Advisory Committee (TAC), what modifications to Condition of Certification BIO-16b would best facilitate public transparency?**

Portions of Condition of Certification **BIO-16b** are similar to the requirements of the ISEGS project to develop and implement an Avian & Bat Monitoring and Management Plan which was recently approved by Energy Commission staff and the BLM in consultation with the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife.[4] Because the PSEGS project would also be a joint Energy Commission and BLM project, if the project is approved by both agencies, the Technical Advisory Committee (TAC) would also likely be co-chaired by the Energy Commission and the BLM. Therefore, the Energy Commission should recommend the TAC consider public comment during the development and implementation of the plan without being prescriptive.

5. **If the Riverside County LORS are preempted by federal law in Land Use, why are they not preempted in Visual Resources?**

The Riverside County LORS are preempted in both Land Use and Visual Resources. As stated in the Visual Resources section of the Final Staff Assessment, "[b]ecause the PSEGS would be located entirely on land managed by the BLM, the project would not be subject to the County of Riverside's LORS. However, staff has included a discussion of the project's consistency with the visual resources goals and objectives of Riverside County since these LORS informed staff's CEQA analysis of the project and indicate the importance of open space and scenic resources to the county." (Exh. 2000, p. 4.12-35 (emphasis added).) Staff acknowledges that the Executive Summary was published

[4] The approved ISEGS Bird & Bat Monitoring and Mitigation Plan Rev 12 is in the Ivanpah docket log at http://docketpublic.energy.ca.gov/PublicDocuments/07AFC05C/TN201315_20131122T160942_ISEGS_Avian_Monitoring_Plan_rev_12.PDF

with an incorrect table, indicating that there was not compliance with LORS under Visual Resources. That error was corrected at Exhibit 2002, Energy Commission Staff's Testimony and Errata to the Final Staff Assessment Part A, at page 1.

Date: November 26, 2013

Respectfully Submitted,

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Jennifer Martin-Gallardo
Attorney

APPENDIX A

COMMENTS REGARDING A POSSIBLE ENERGY COMMISSION FINDING OF OVERRIDING CONSIDERATIONS

Roger Johnson
Deputy Director of the Siting, Transmission and Environmental Protection Division

Palen Solar Holdings, LLC (PSH) has filed a Petition for Amendment of the Palen Solar Power Project (PSPP) which was approved by the Energy Commission on December 15, 2010 (Order No. 10-1215-19, the "Final Decision", 09-AFC-7). The Petition proposes to eliminate the use of solar parabolic trough technology and replace it with BrightSource's Luz Power Tower solar power tower technology. The Final Decision found that the PSPP would result in significant direct or cumulative impacts to Visual and Cultural Resources that could not be mitigated to less than significant levels.

The PSPP Final Decision concurred with Staff's recommendation that substantial evidence existed that project benefits outweighed the significant impacts and that it was appropriate to approve the PSPP despite its remaining significant impacts in these technical areas.

The Final Decision took notice of the following documents which are still applicable in supporting the benefits of renewable energy in California from the amended project:

- Climate Action Team Report to Governor Schwarzenegger and the Legislature. CalEPA, March 2006.
- AB 32 Scoping Plan. CARB, December 2008.
- Integration of Renewable Resources. CAISO, Nov. 2007.
- 2007 Integrated Energy Policy Report. CEC, Nov. 2007.
- 2009 Integrated Energy Policy Report. CEC. Nov. 2009.
- Draft Final Opinion on Greenhouse Gas Regulatory Strategies: Joint
- Agency Proposed Final Opinion. CPUC/CEC 2008.
- Framework for Evaluating Greenhouse Gas Implications of Natural
- Gas-Fired Power Plants in California. CEC (MRW and Associates). May 2009.

Staff's Final Staff Assessment (FSA) of Palen Solar Electric Generating System (PSEGS), the proposed amended project, indicates that, like PSPP, it will result in significant environmental impacts that cannot be mitigated for Visual Resources and Cultural Resources. Unlike the PSPP, Staff has also determined that the proposed project would very likely result in significant and unmitigable impacts to Biological Resources, mainly due to the solar power tower technology's introduction of solar flux

danger to avian species. The proposed project amendment will satisfy all applicable laws, ordinances, regulations, and standards (LORS). Staff is not, however, recommending that the Commission adopt a statement of overriding considerations. At page 4.2-163 of the FSA, Biological Resources staff concluded that:

> ***"Conclusions and Discussion of Mitigation***
>
> Based on staff's understanding of solar energy flux intensity and exposure limits, staff believes that birds flying through energy flux in excess of safe thresholds will likely suffer significant damage to flight feathers, eyes, or skin. In some cases, where they fly through higher flux levels, these birds will fall to the ground with evidence of severe burning as reported by McCreary et al. (1986). Staff believes that many birds may continue flying for a few seconds or minutes, perhaps long enough to escape the hazard, but will be unable to fly effectively, find food, or escape predators and will die a short time after the exposure or persist for longer periods but with reduced reproductive success.
>
> Staff believes that some birds exposed to concentrated solar flux will be at risk of suffering (1) hyperthermia, which may result in disorientation and/or other damaging physiological repercussions and, depending on time and level of exposure (2) feather damage with a consequent flight impediment: or anatomical effects such as tissue damage, temporary or permanent vision impairment. These effects are influenced by both the dose level and exposure time. These effects are considered significant and may be unmitigable, based on the species affected, and the severity of the impact." (See FSA, exhibit 2000, page 4.2-1 and following for the entire Biological Resources discussion.)

While this conclusion represents a change from the originally licensed project, it reflects new information relating to the avian mortality events occurring at the recently constructed Ivanpah solar thermal tower projects that have been generating solar flux during project commissioning activities.

Section 1755 of the Commission's siting regulations (title 20, California Code of Regulations) states that if the Commission cannot find that changes or alterations have been required in, or incorporated into, the project that mitigate or avoid the significant environmental effects identified in the proceeding, then it may not certify the project unless it specifically finds both (1) that specific economic, social, or other considerations make infeasible the mitigation measures or project alternatives identified in the application proceeding, and (2) that the benefits of the project outweigh the unavoidable significant adverse environmental effects that may be caused by the construction and operation of the facility.

California Environmental Quality Act (CEQA) Guidelines section 15093, title 14, California Code of Regulations, states that CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against

its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered "acceptable."

This project is a solar power plant that could help California meet its renewable portfolio standard (RPS) of 33 percent by 2020 and AB 32 greenhouse gas emission reduction goals. As such, it could provide critical environmental benefits by helping the state reduce its greenhouse gas emissions, and Staff must weigh these positive attributes against the project's adverse impacts in deciding whether to recommend that the Commission adopt a statement of overriding considerations.

In considering section 1755's mandates, Staff first looked at whether specific economic, social, or other considerations make infeasible the project alternatives identified in the application proceeding. Staff identified three alternatives. The analyses are summarized in the FSA, exhibit 2000, beginning at page 6.1-93, and are briefly described here.

The three project alternatives selected for full analysis and comparison to the proposed modified project are:

1. No-Project Alternative: The PSEGS site was previously approved for development of a 500-megawatt (MW) parabolic trough project using either of two reconfigured alternative project configurations; therefore, construction and operation of a 500-megawatt parabolic trough project at the approved site is a potential outcome should plans for the proposed modified project fail to proceed. The No-Project Alternative evaluates the impacts of the proposed modified project compared to the impacts of constructing and operating either of the approved reconfigured alternatives from the original PSPP.

2. Solar Photovoltaic Alternative with Single-Axis Tracking Technology

3. Reduced Acreage Alternative with Solar Power Tower Technology

For the No-Project Alternative, Staff concluded that constructing and operating the approved Reconfigured Alternative #2 or #3 (i.e., the No-Project Alternative) would avoid or substantially reduce certain impacts on Biological Resources, Cultural Resources, and Visual Resources, and two impacts from the proposed project would not occur with construction and operation of Reconfigured Alternative #2 or #3:

- Biological Resources – impacts on avian species from exposure to concentrated solar flux.

- Visual Resources – glint or glare effects from 750 foot-high solar receiver steam generators.

With respect to the Solar PV Alternative with Single-Axis Tracking Technology alternative, Staff concluded that constructing and operating this alternative would avoid or substantially reduce several impacts on Biological Resources, Cultural Resources, Traffic and Transportation, and Visual Resources. Those impacts are:

• Biological Resources – impacts on avian species from exposure to concentrated solar flux.
• Cultural Resources – all of the offsite impacts associated with the 750 foot-high solar receiver steam generators would be avoided
• Traffic and Transportation – glare impacts to motorists and pilots would be substantially reduced.
• Visual Resources – Glint or glare effects from the 750 foot-high solar receiver steam generators would avoided.

For Cultural Resources, Traffic and Transportation, and Visual Resources impacts, the Solar PV Alternative with its much lower vertical profile and reduced potential for operational glint and glare effects would offer the potential to develop mitigation measures that would go furthest toward reducing impacts on these resources.

Therefore, Staff has identified two alternatives, the parabolic solar trough (no project) and the photovoltaic single axis tracking project, which are environmentally superior to the proposed project. The project proponent has identified economic considerations that it believes makes these alternatives infeasible, but Staff does not have sufficient information to make that conclusion.

With respect to the second finding of section 1755 (that the benefits of the project outweigh the unavoidable significant adverse environmental effects), Staff agrees that currently there is insufficient scientifically deduced information about actual avian impacts from power tower solar flux. However, preliminary compliance monitoring information from the Ivanpah project (which is about to begin commercial operation of three solar power towers) about avian species mortality from solar flux has caused Staff to have serious reservations about whether the benefits of the proposed modified project outweigh the significant adverse environmental effects.

CEQA Guidelines section 15093 allows the Commission to find the adverse environmental effects “acceptable” if there are region-wide or statewide environmental benefits, among other things. Staff has pointed out the region-wide and statewide environmental benefits of this solar project. However, Staff does not believe this technology is superior to other renewable projects that have fewer significant adverse impacts.

Staff’s position on this project should not be read as a blanket rejection of this technology. Our determinations will be made on a case-by-case basis. As with all electricity infrastructure projects, there are project-specific attributes, like site selection,

that are critical factors in determining impacts and Staff's position on whether a Commission override is appropriate or warranted.

After the approved solar power plants have been constructed and have been operational and monitored for an appropriate period of time, Staff and others will have more information about the impacts and efforts taken to adaptively manage those impacts to evaluate and compare the characteristics of the various solar technologies. Based on this information, Staff will be better informed to determine whether some technologies are preferable from an environmental perspective and will factor that evaluation into our alternatives analysis. Important issues to analyze will include water use, land use (amount of land needed per megawatt of generating capacity), visual impacts, cultural resource impacts, ground disturbance, and impacts to avian species.